

**MX269012A
W-CDMA/HSPA Uplink
Measurement Software
Operation Manual
Remote Control**

Third 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 Signal Analyzer Operation Manual (Mainframe Operation) or MS2830A Signal Analyzer Operation Manual (Mainframe Operation) and MX269012A W-CDMA/HSPA Uplink Measurement Software Operation Manual (Operation). Please also refer to these documents before using the equipment.
- Keep this manual with the equipment.


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These indicate that the marked part should be recycled.

MX269012A
W-CDMA/HSPA Uplink Measurement Software
Operation Manual Remote Control

4 February 2008 (First Edition)
15 Decembert 2009 (Third Edition)

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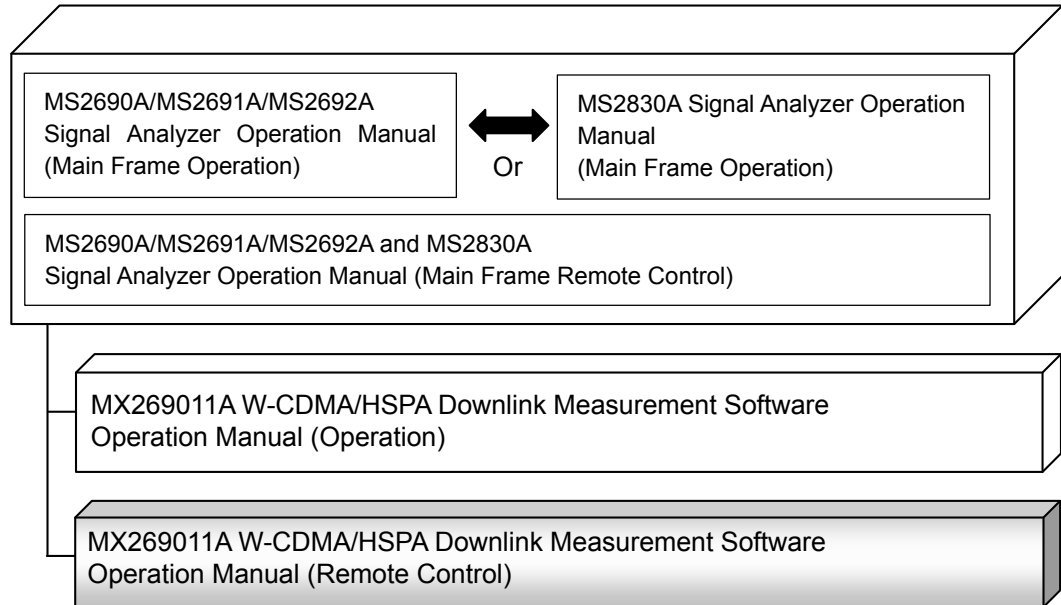
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About This Manual

■ Organization of Operation Manuals

The operation manuals for the MX269012A W-CDMA/HSPA Uplink Measurement Software are organized as shown below.



- Mainframe Operation
- Mainframe Remote Control

These manuals describe the basic operating methods, maintenance procedures, common functions, and common remote control of the signal analyzer mainframe.

- MX269012A W-CDMA/HSPA Uplink Measurement Software Operation Manual (Operation)

This manual describes the operating methods of the MX269012A W-CDMA/HSPA Uplink Software.

- MX269012A W-CDMA/HSPA Uplink Measurement Software Operation Manual (Remote Control) <This document>

This manual describes remote control of the MX269012A W-CDMA/HSPA Uplink Measurement Software.

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Chapter 1 Overview

This chapter provides an overview of the remote control of the MX269012A W-CDMA/HSPA Uplink Measurement Software (hereinafter, referred to as “this application”).

1

Overview

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1.1 Outline

This application can be controlled from an external controller (PC) by remote control commands using the MS269x Series or MS2830A Signal Analyzer (hereafter referred to as “this instrument”). This application can be controlled from an external controller (PC) by a remote control command using the MS2690A/MS2691A/MS2692A or MS2830A signal analyzer.

Remote control commands for this application are in the SCPI format defined by the SCPI Consortium. The remote control command of this application is of the SCPI form which is defined by the SCPI Consortium.

1.1.1 Interface

This instrument has GPIB, Ethernet, and USB interfaces for remote control. Only one interface can be used at a time.

The interface is determined automatically when a command is received at the start of communication. The interface enters the remote state when a remote command is detected from the external controller (PC). At remote-interface operation, the front panel  lamp lights; the lamp is off at local-interface operation.

Refer to the “MS2690/MS2691/MS2692A and MS2830A Signal Analyzer manual (Mainframe Remote Control)” for more details about remote control and interface setting.

1.1.2 Controlled Application

Two kinds of remote control commands can be used with this instrument: commands that are common to all applications (hereafter common commands), and other commands unique to a specific application. Common commands can be executed at any time and do not depend on the currently controlled application. However, when a command unique to a specific application is executed at another application, the command is not executed and an error occurs.

In this instrument, multiple applications can be activated at the same time. Only one application resource can be executed per piece of hardware at one time. This application performs a measurement for 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. In order to execute a function unique to the application by using remote control, you need to select this application once it has been activated. Furthermore, this application can be executed at the same time as another application that uses by itself a resource not used by this application, such as the Vector Signal Generator Option.

1.2 Basic Flow of Control

This part explains the basic remote control command programming for measuring a W-CDMA Uplink signals.

Figure 1.2-1 shows the control flow for a basic test. Note the parameter settings for the measurement, type of measurement function, and measurement execution order (although the measurement order can change).

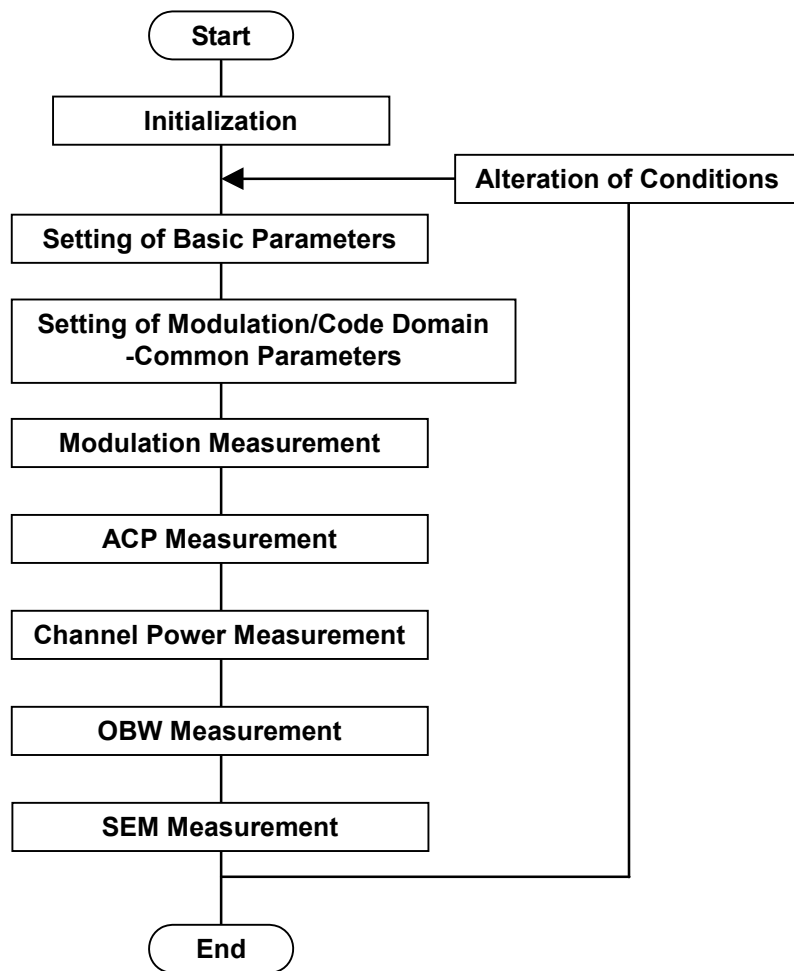



Figure 1.2-1 Basic Test Flow

(1) Initialization

The communication interface is initialized and the parameters are initialized at the application start.

 1.2.1 Initialization


(2) Basic Parameter Settings

The carrier frequency, input level and all other measurement parameters are set.

 1.2.2 Basic Parameter Settings


(3) Modulation/Code Domain Common Settings


Set the parameters used in common by the Modulation/Code Domain measurement functions to be executed in this application. The parameters include the trigger, scrambling code, and transient periods.

 1.2.3 Modulation/Code Domain Common Settings

(4) Modulation/Code Domain Measurement

Execute the measurement functions to be executed in this application in order. First, select a measurement function. Next, set parameters such as trace/storage mode for each measurement function in order to execute the measurement and read out the measurement result.

 1.2.4 Modulation Measurement

 1.2.5 Code Domain Measurement

(5) ACP/Channel Power/OBW/SEM measurement

This executes the spectrum analyzer and signal analyzer functions. The basic parameters for these functions are set by this application. Measurement results are read by selecting the application and parameters, such as trigger mode, storage mode, BW analysis, trace mode, sweeping, etc.

 1.2.6 ACP Measurement

 1.2.7 Channel Power Measurement

 1.2.8 OBW Measurement

 1.2.7 SEM Measurement

1.2.1 Initialization

As part of the initial settings, perform the preparations for using the measuring instrument and the application. The following actions are included in the initial settings.

- (1) Initialization of Communication Interface
The remote control interface to be used is initialized so sending and receiving of commands can start. Refer to the “MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer manual (Mainframe Remote Control)” for details about the remote control interface.
- (2) Setting Language Mode and Response Format
The language mode and the response format used to communicate are set. Refer to the “MS2690/MS2691/MS2692A and MS2830A Signal Analyzer manual (Mainframe Remote Control)” for details about the language mode and response format.
- (3) Starting Application
The application is started. The signal analyzer and spectrum analyzer applications should be loaded too.
- (4) Selecting Application
The target application is selected.
- (5) Initialization
All parameters and states are reset at initialization.
- (6) Setting Measurement Mode.
After initialization, the measurement mode is at continuous measurement mode. To select single measurement mode, switch to the single measurement mode.

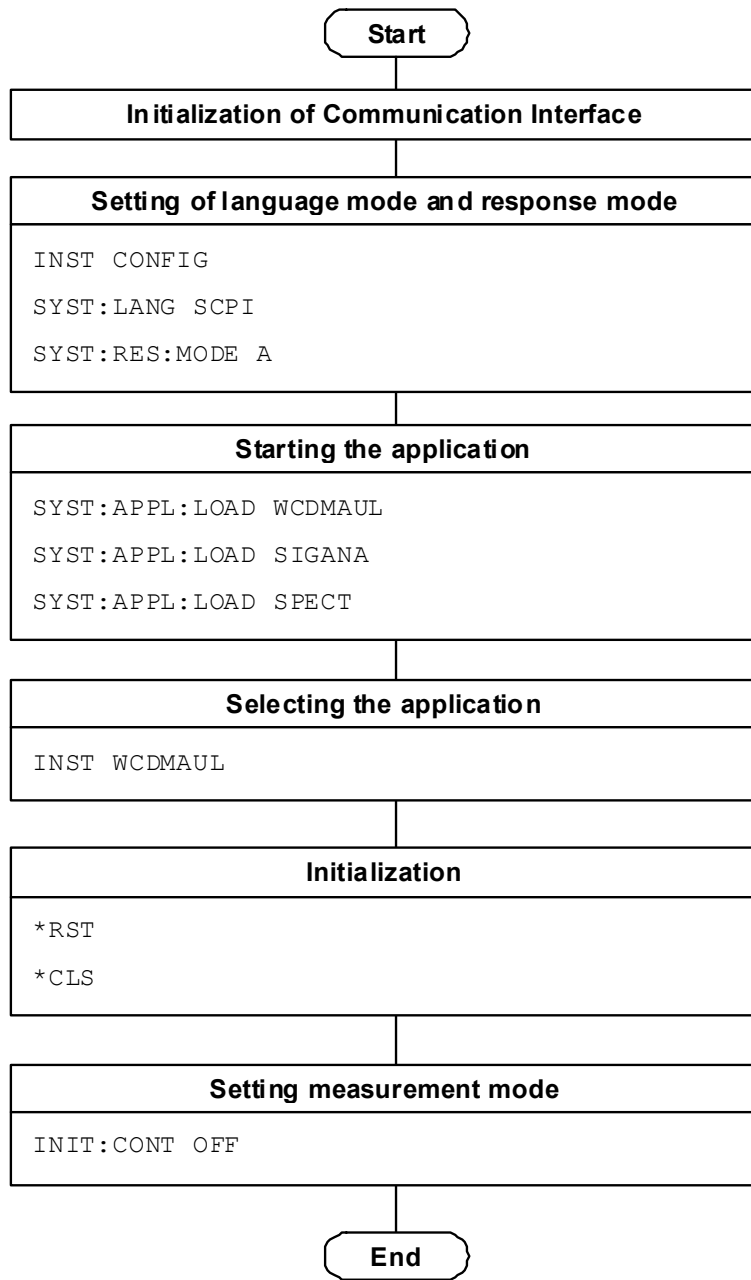


Figure 1.2.1-1 Initialization Flow and Command Example

1.2.2 Basic Parameter Settings

Set the parameters used in common for to all measurements using this application, the Signal Analyzer, and the Spectrum Analyzer. The basic parameters include the following.

- (1) Carrier Frequency
- (2) Input Level (Reference Level/Attenuator)
- (3) Level Offset
- (4) Pre-Amp (option)

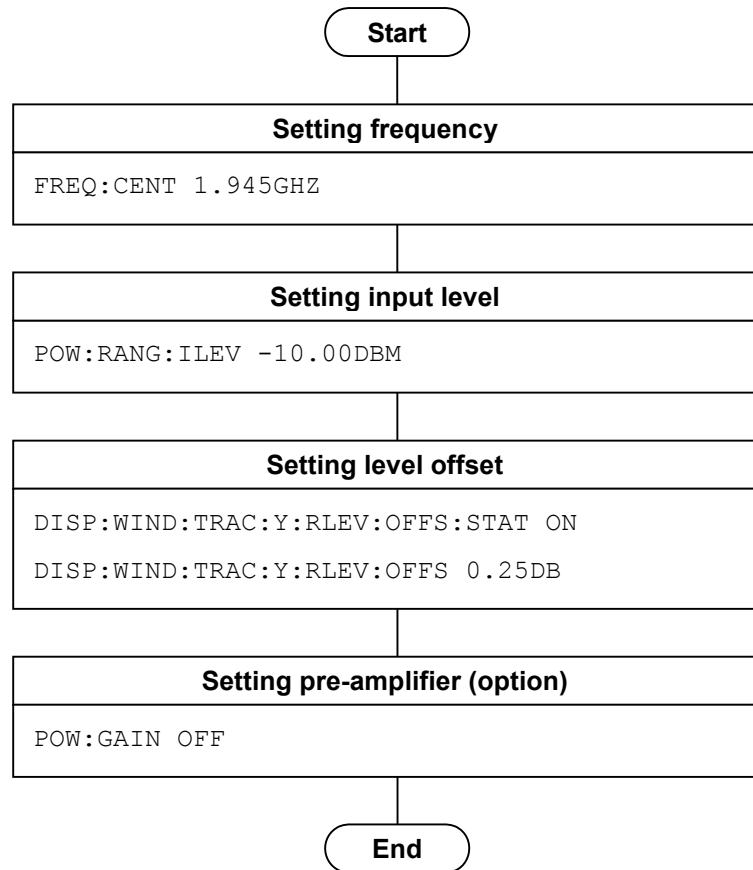


Figure 1.2.2-1 Basic Parameter Setting Flow and Examples of Commands

1.2.3 Modulation/Code Domain Common Settings

Set the parameters used in common for the Modulation/Code Domain measurement functions executed in this application. Unless specified, there is no specific parameter setting order.

- (1) Trigger
 - (a) Trigger Switch
 - (b) Trigger Source
 - (c) Trigger Slope
 - (d) Trigger Delay
- (2) Scrambling Code
- (3) Transient Periods
- (4) Origin Offset
- (5) Active Code Threshold

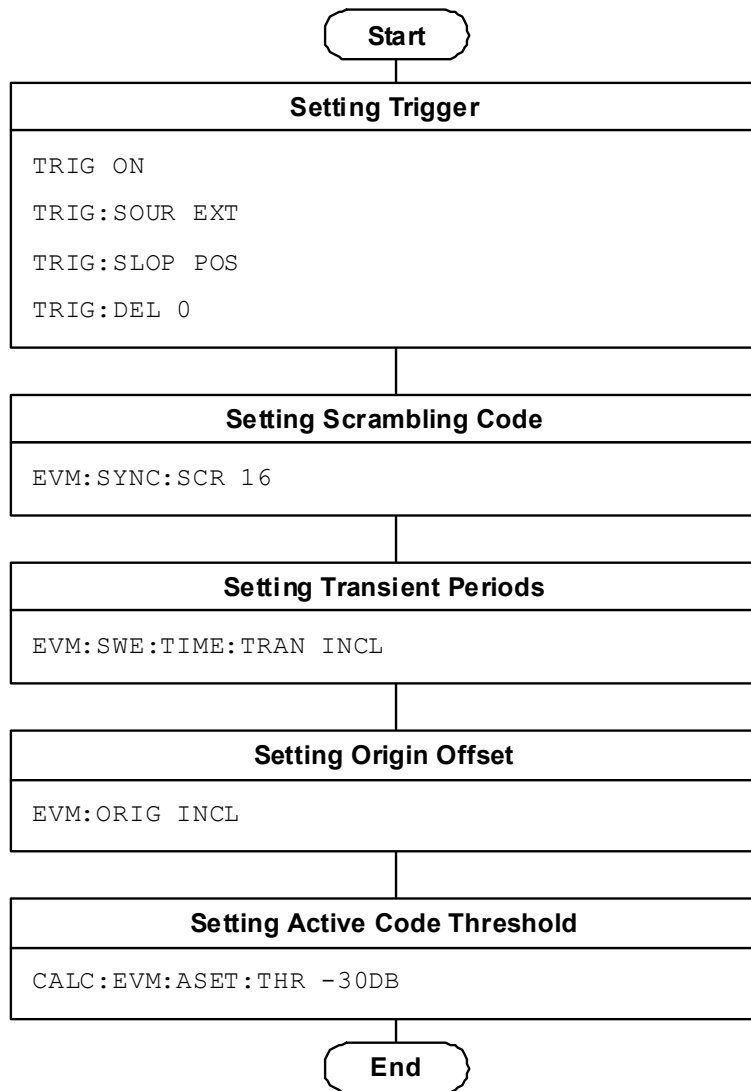


Figure 1.2.3-1 Flow of Common Settings for Modulation/Code Domain and Examples of Commands

1.2.4 Modulation Measurement

This executes the Modulation analysis function as follows:

- (1) Select the measurement function.
- (2) Set the measurement parameters.
The following parameters are only applied to Modulation measurement:

- (a) Starting Slot Number
- (b) Measurement Interval
- (c) Storage
- (d) Target Slot Number

- (3) Execute measurement and read out the result.
- (4) Set the display content.

This setting is required for displaying measured results on the screen, in a manner similar to the manual operation, although it is not necessary when only reading out measured results through remote control.

- (a) Trace
- (b) Scale
- (c) Marker

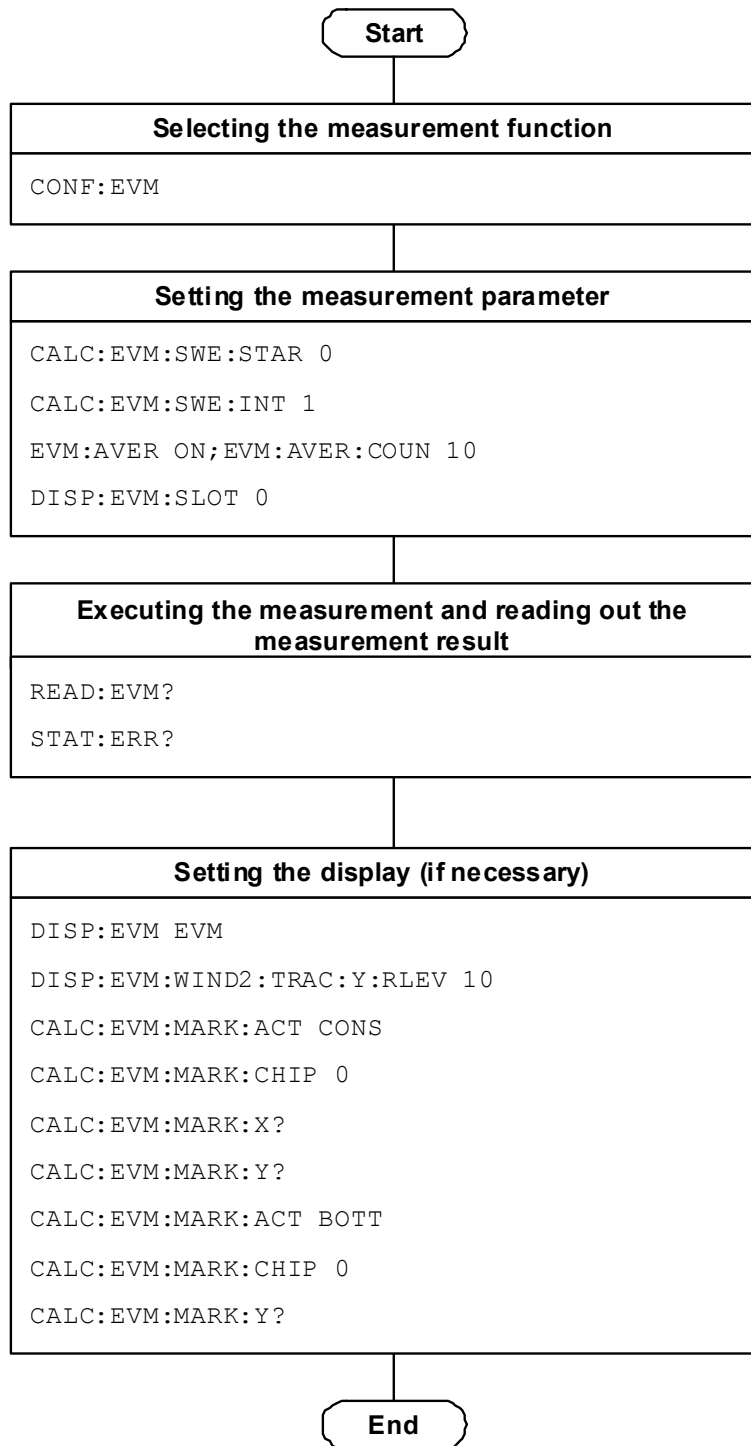


Figure 1.2.4-1 Flow of Modulation Measurement and Command Example

1.2.5 Code Domain Measurement

This executes the Code Domain analysis function as follows:

- (1) Select the measurement function.
- (2) Set the measurement parameter.
The following parameters are only applied to Code Domain measurement:

- (a) Starting Slot Number
- (b) Measurement Interval
- (c) Analysis Code - Branch
- (d) Analysis Code - I Code Number
- (e) Analysis Code - Q Code Number
- (f) Target Slot Number

- (3) Execute the measurement and read out the result.
- (4) Set the display content.

This setting is required for displaying measured results on the screen, in a manner similar to the manual operation, although it is not necessary when only reading out measured results through remote control.

- (a) Trace
- (b) Scale
- (c) Marker

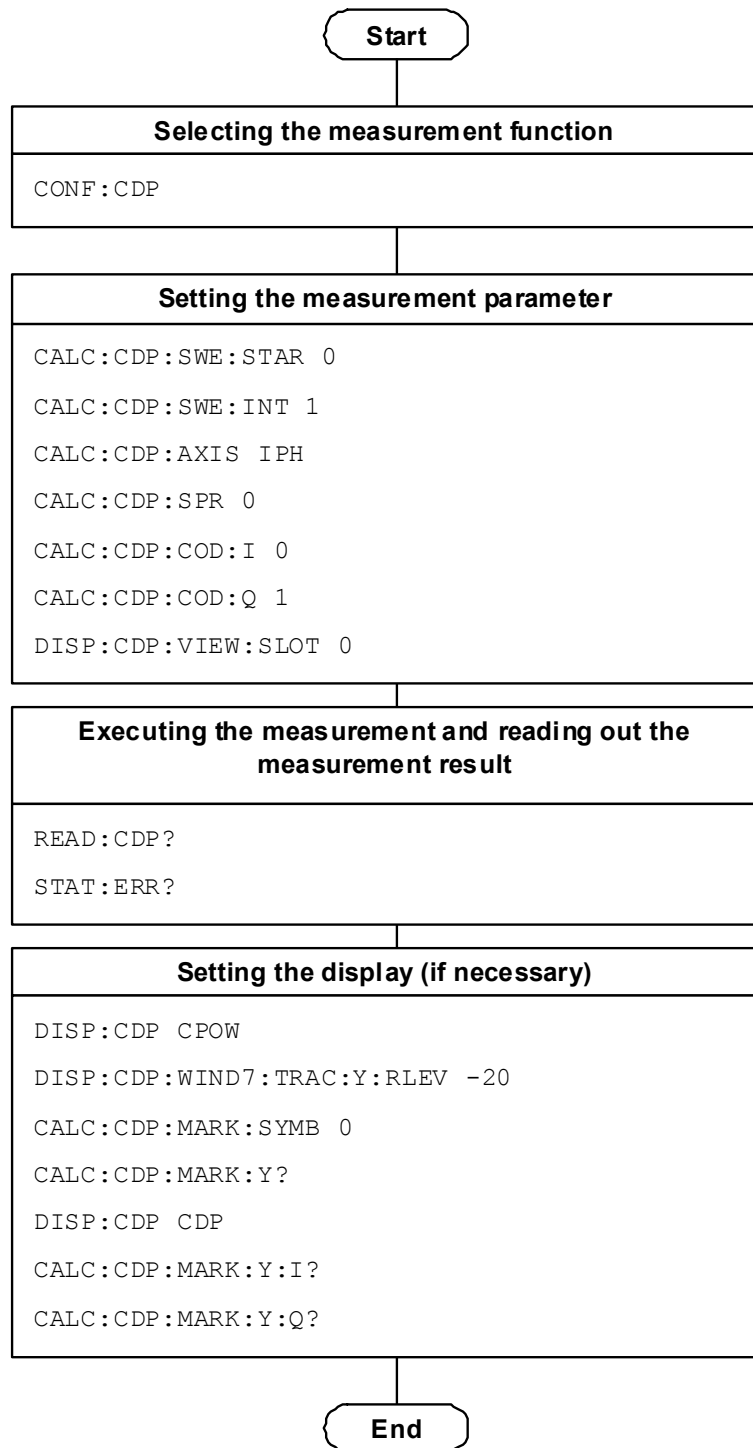


Figure 1.2.5-1 Flow of Code Domain Measurement and Command Example

1.2.6 ACP (Adjacent Channel Power) Measurement

ACP measurement is basically executed in the following order:

- (1) **Selecting application and the measurement function**
Select either Signal Analyzer or Spectrum Analyzer as the application to execute the ACP measurement function. The application will be switched to the selected one if the ACP measurement function is selected. The basic parameter value is reflected to the selected application. Subsequently, only the command/query available in the selected application can be used.

- (2) **Setting measurement parameters**

The following parameters apply only to the specific application selected.

- (a) Trigger
- (b) Time Length/Filter Type/Storage, etc. (in Signal Analyzer)
- (c) Sweep Time/Filter Type/Storage, etc. (in Spectrum Analyzer)

- (3) **Measuring and reading results**

- (4) **Set the display content.**

This setting is for displaying the result on the screen. However, you do not need to perform the setting if you only query the result through remote control.

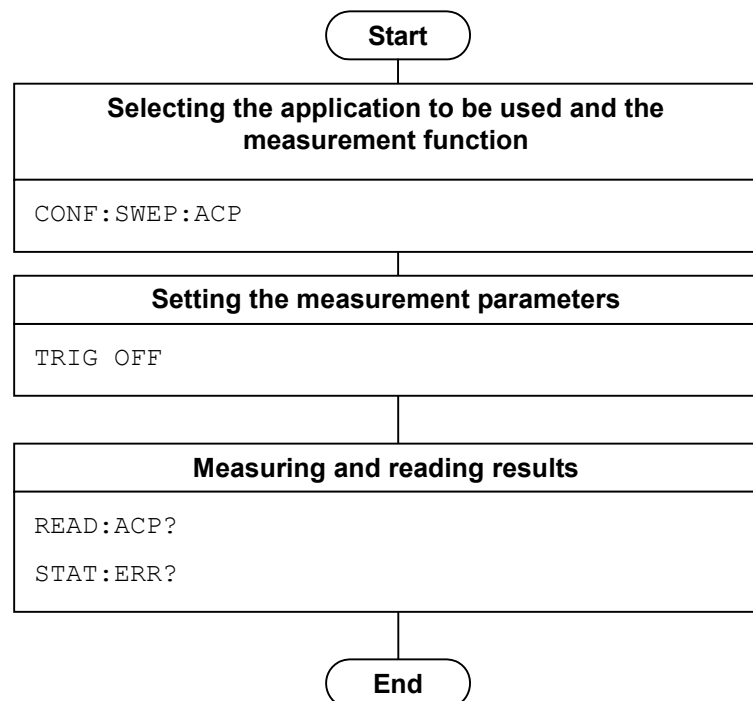


Figure 1.2.6-1 Flow of ACP Measurement using Spectrum Analyzer and Command Example

1.2.7 Channel Power Measurement

The Channel Power measurement is basically executed in the following order:

- (1) **Selecting application and the measurement function**
Select either Signal Analyzer or Spectrum Analyzer as the application to execute the Channel Power measurement function. The application will be switched to the selected one if the Channel Power measurement function is selected. The basic parameter value is reflected to the selected application. Subsequently, only the commands/queries available in the selected application can be used.
- (2) **Setting measurement parameters**
The following parameters apply only to the specific application selected.
 - (a) Trigger
 - (b) Time Length/Filter Type/Storage, etc. (in Signal Analyzer)
 - (c) Sweep Time/Filter Type/Storage, etc. (in Spectrum Analyzer)
- (3) **Measuring and reading results**
- (4) **Set the display content.**
This setting is for displaying the result on the screen. However, you do not need to perform the setting if you only query the result through remote control.

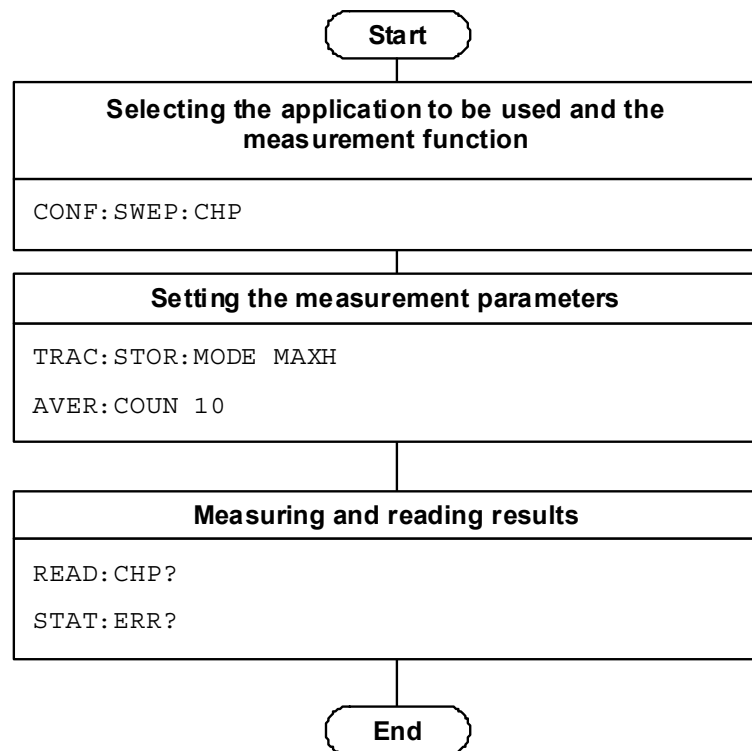


Figure 1.2.7-1 Flow of Channel Power Measurement using Signal Analyzer and Command Example

1.2.8 OBW (Occupied Bandwidth) Measurement

The OBW measurement is basically executed in the order below:

- (1) **Selecting application and the measurement function**
Select either Signal Analyzer or Spectrum Analyzer as the application to execute the OBW measurement function. The application will be switched to the selected one if the OBW measurement function is selected. The basic parameter value is reflected to the selected application. Subsequently, only the commands/queries available in the selected application can be used.
- (2) **Setting measurement parameters**
The following parameters apply only to the specific application selected.
 - (a) Trigger
 - (b) Method/N% Ratio/XdB Value, etc.
- (3) **Measuring and reading results**
- (4) **Set the display content.**
This setting is for displaying the result on the screen. However, you do not need to perform the setting if you only query the result through remote control.

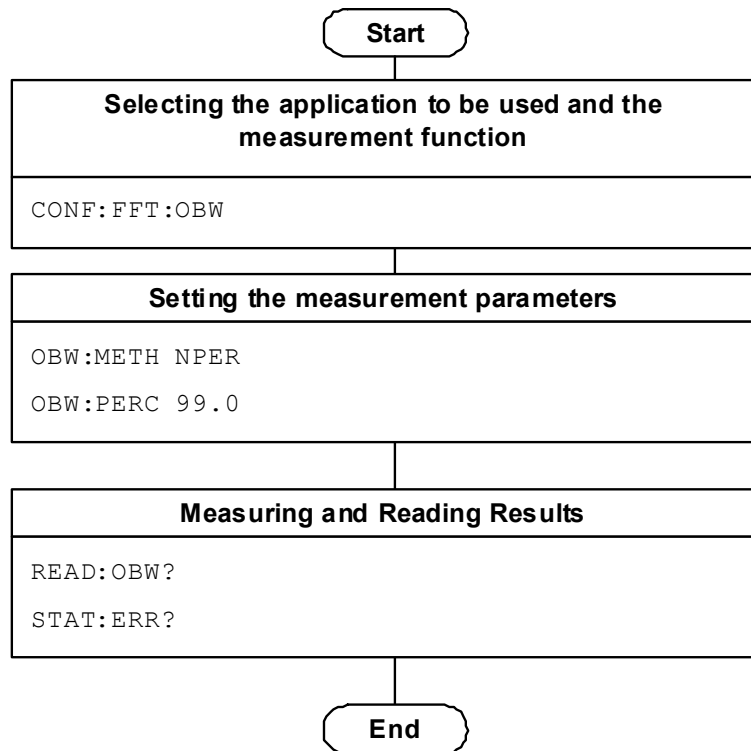


Figure1.2.8-1 Flow of OBW Measurement using Signal Analyzer and Command Example

1.2.9 SEM (Spectrum Emission Mask) Measurement

The SEM measurement is basically executed in the order below:

(1) Selecting the measurement function

The application will be switched to the selected one if the SEM measurement function is selected. The basic parameter value is reflected to the selected application. Subsequently, only the commands/queries available in the selected application can be used.

Note:

The SEM measurement function is enabled only in the Spectrum Analyzer.

(2) Setting measurement parameters

The following parameters apply only to the specific application selected.

- (a) Trigger
- (b) Storage, etc.

(3) Measuring and reading results

(4) Set the display content

This setting is for displaying the result on the screen. However, you do not need to perform the setting if you only query the result through remote control.

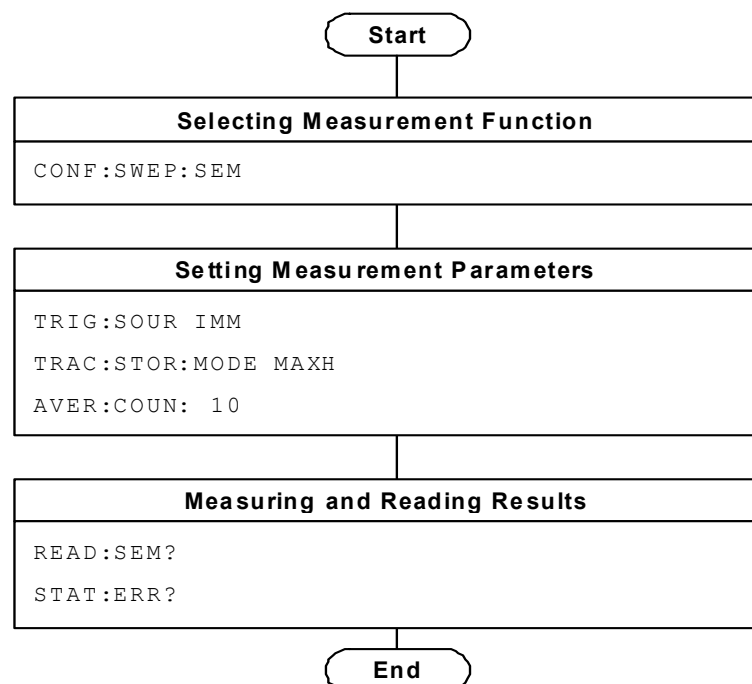


Figure 1.2.9-1 Flow of SEM Measurement using Spectrum Analyzer and Command Example

1.2.10 Signal Analyzer/Spectrum Analyzer Switching

There are the following two methods for switching from this application to Signal Analyzer/Spectrum Analyzer during remote control.

Note:

For MS2830A: To switch to signal analyzer, the analysis bandwidth option 31.25 MHz or greater is required.

- (1) Execute `CONFigure[:FFT|SWEpt]:<measure>`

The basic parameters such as the carrier frequency/input level (reference level) are reflected to the selected application.

Furthermore, a template is automatically set depending on the state of this application. There is no limitation on control of the selected application.

Note:

This may be impossible depending on the application used and the selected measurement function.

Also, you can switch between Signal Analyzer and Spectrum Analyzer by using `CONFigure:FFT|SWEpt:<measure>`. In the same way, the template and the basic parameters such as the carrier frequency/input level (reference level) are reflected.

Similarly, the template and the basic parameters such as the carrier frequency/input level (reference level) changed in Signal Analyzer or Spectrum Analyzer are reflected, when returning to the control of the measurement application by `CONFigure:<measure>`.

Compared with method (2), you can shorten the execution time of the program, since you do not need to reset the basic parameter per a measurement function.

- (2) Execute `:INSTrument[:SElect] SIGANA|SPECT`

No parameter and template are reflected in this method.

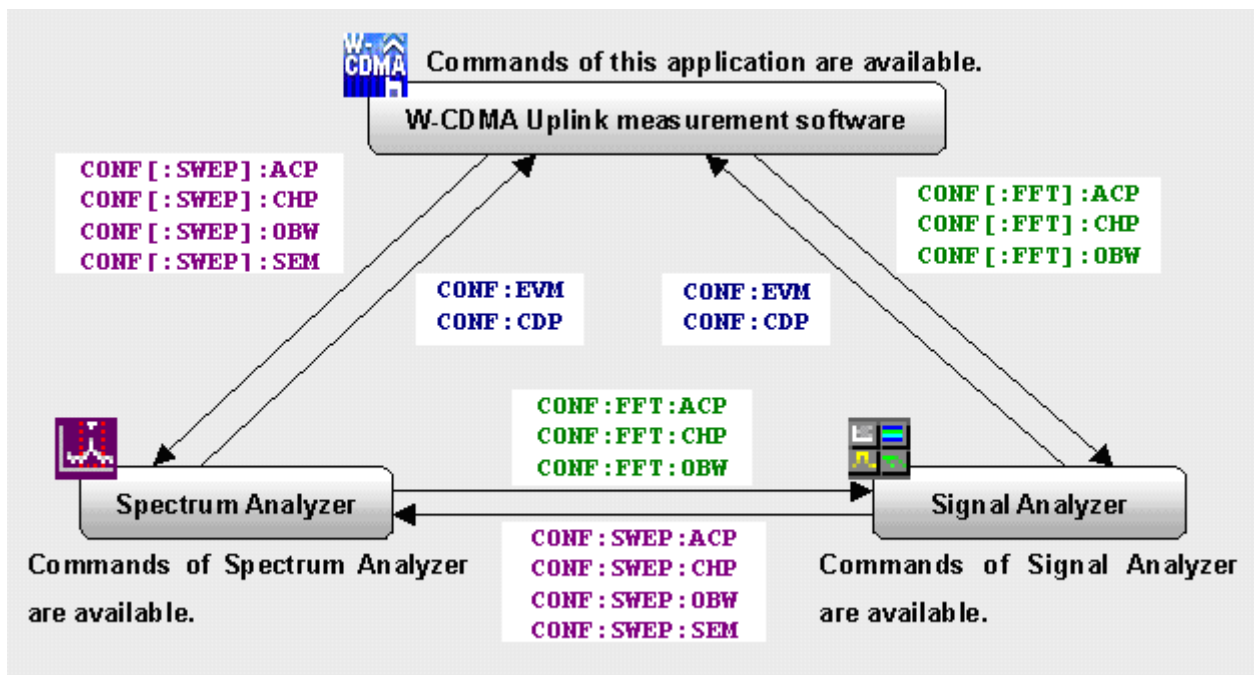


Figure 1.2.10-1 Switching of Measurement Functions among Applications

Figure 1.2.10-1 shows the measurement functions offered by each application and the switching commands. For example, you need to program `CONF:SWEPT:ACP`, in order to invoke the ACP measurement function of Spectrum Analyzer from this application. You can write `CONF:ACP` without writing `SWEPT` since it is set to use Spectrum Analyzer for the ACP measurement function if `ACP:INST SWEPT` is transmitted in advance. `CONF[:SWEPT]:<measure>` in Figure 1.2.10-1 means that `SWEPT` can be omitted if `<measure>:INST SWEPT` is transmitted in advance.

If you switch the measurement function from Spectrum Analyzer to Signal Analyzer, or in the opposite way, you need to program `CONF:FFT:<measure>` or `CONF:SWEPT:<measure>`. If `FFT` or `SWEPT` is omitted, the measurement function will be selected by the presently selected application.

1.3 How to use the Native Mode

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

(1) SCPI Mode

Processes commands conforming to the grammar/document format defined in SCPI (ver1999.0)). In the SCPI mode, you can use the character string in long/short form format and can omit angled bracket ([]) definition character strings.

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

(2) Native Mode

Processes commands that are in this instrument’s own definition type. Unless otherwise specified, the character string of the command header is fix. If a command of the application is only defined by SCPI mode, the character string converted by the conversion rule will be the command in the Native mode. For programming, you cannot use the grammar of SCPI mode, such as character string in long/short form format and cannot omit any angled bracket ([]) definition character strings.

Note:

In the Native mode, you cannot use `STATus:QUESTionable` and `STATus:OPERation` registers. Neither can you use them by converting to Native mode according to the conversion rules.

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

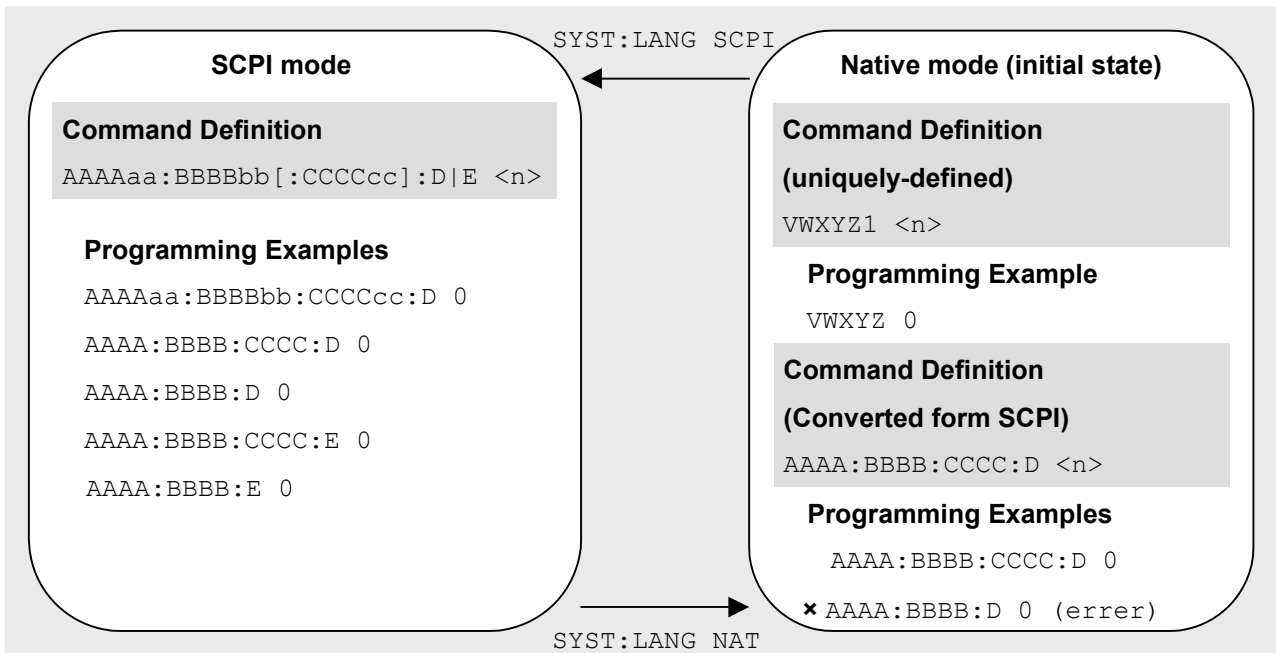


Figure 1.3-1 SCPI mode and Native mode

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

Conversion rule

- [1] Delete the numeric parameter in the program header of an SCPI command, and describe the argument corresponding to the numeric parameter as the first argument. If the argument can have only one numeric value and the argument can be omitted, omit it. Describe the argument if it cannot be omitted.
- [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 1

Convert :CALCulate:MARKer[1]|2[:SET]:CENTer into a Native command.

- [1] Put a numeric parameter of the program header at the head of the argument.

:CALCulate:MARKer [1]|2[:SET]:CENTer

↓

:CALCulate:MARKer[:SET]:CENTer <integer>

(the argument <integer> represents the numeric value 1 or 2)

- [2] Delete the layers that can be deleted.

:CALCulate:MARKer [:SET]:CENTer <integer>

↓

:CALCulate:MARKer:CENTer <integer>

- [3] Alter all long forms into short forms.

:CALCulate:MARKer:CENTER <integer>

↓

:CALC:MARK:CENT <integer>

- [4] Delete the colon mark (“:”) at the head.

.CALC:MARK:CENT <integer>

↓

CALC:MARK:CENT <integer>

Example 2

Convert [:SENSe]:BPOWer|:TXPower[:STATe]?
into a Native command.

- [1] Use the leading one if multiple nodes can be selected.

[:SENSe]:BPOWer|:TXPower[:STATe]?

↓

[:SENSe]:BPOWer[:STATe]?

- [2] Delete the layers that can be deleted.

[:SENSe]:BPOWer[:STATe]?

↓

:BPOWer?

- [3] Alter all long forms into short forms.

:BPOWer?

↓

:BPOW?

- [4] Delete the colon mark (":") at the head.

:BPOW?

↓

BPOW?

1.4 Character Programs Available for Setting Numeric Program Data

The following character programs can be used for setting numeric program data (numeric parameter) and are applicable only when using the SCPI mode.

(1) DEFault

When DEFault is specified for numeric program data, the initial value is set for the target parameter.

(2) MINimum

When MINimum is specified for numeric program data, the minimum value is set for the target parameter.

(3) MAXimum

When MAXimum is specified for numeric program data, the maximum value is set for the target parameter.

In this application, DEFault, MINimum, and MAXimum can be used for the following parameters.

<freq>

<real>

<integer>

<rel_power>

<rel_ampl>

<time>

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 function. Refer to the “MS2690/MS2691/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe Remote Control)” for detailed specifications of the IEEE488.2 common device messages and application common device messages.

2

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2.1 Selecting Application

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

Table 2.1-1 Selecting Application

Parameter	Device Message
Load Application	:SYSTem:APPLication:LOAD WCDMAUL
Unload Application	:SYSTem:APPLication:UNLoad WCDMAUL
Application Switch	:INSTrument[:SElect] WCDMAUL
	:INSTrument[:SElect]?
Application Status	:INSTrument:SYSTem WCDMAUL, [ACTive] INACTive MINimum
	:INSTrument:SYSTem? WCDMAUL
Initialization	:INSTrument:DEFault
	:SYSTem:PRESet

2.1.1 Activating Application

:SYSTem:APPLication:LOAD WCDMAUL

Load Application

Function

Activates this application.

Command

```
:SYSTem:APPLication:LOAD WCDMAUL
```

Details

The installed application is activated by this function and registered with the Application Switch menu.

This function is enabled when the target application is Config.

Example of Use

```
To activate this application.  
INST CONFIG  
SYST:APPL:LOAD WCDMAUL
```

:SYSTem:APPLication:UNLoad WCDMAUL

Unload Application

Function

Terminates this application.

Command

```
:SYSTem:APPLication:UNLoad WCDMAUL
```

Details

The activating application is terminated by this function and deleted from the Application Switch menu.

This function is enabled when the target application is Config.

Example of Use

```
To terminate this application.  
INST CONFIG  
SYST:APPL:UNL WCDMAUL
```

2.1.2 Selecting Application

`:INSTrument[:SElect] WCDMAUL|CONFIG`

Application Switch

Function

Selects the application targeted for control.

Command

`:INSTrument[:SElect] <apl_name>`

Parameter

<apl_name>	Application
WCDMAUL	This application measurement software
CONFIG	Config

Details

To select a measurement function of Signal Analyzer or Spectrum Analyzer from this application, use the following.

```
:CONFigure[:FFT|SWEpt]:ACP
:CONFigure[:FFT|SWEpt]:CHPower
:CONFigure[:FFT|SWEpt]:OBWidth
:CONFigure[:SWEpt]:SEMask
```

Example of Use

To switch the control target to this application measurement software.
`INST WCDMAUL`

:INSTrument[:SElect]?

Application Switch Query

Function

Queries the application targeted for control.

Query

:INSTrument[:SElect]?

Response

<apl_name>

Parameter

<apl_name>	Application
WCDMAUL	This application measurement software
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
CONFIG	Config

Details

WCDMAUL is returned when a measurement function of the W-CDMA Uplink measurement software such as Modulation and Code Domain is selected.

SIGANA or SPECT is returned when a measurement function of Signal Analyzer or Spectrum Analyzer such as ACP, Channel Power, OBW , and SEM are selected.

Example of Use

To query the application targeted for control.

```
INST?
```

```
> WCDMAUL
```

:INSTrument:SYSTem WCDMAUL,[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
WCDMAUL	This application measurement software
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
CONFIG	Config
<code><window></code>	Window status
ACTive	Active status
INACTive	Non active status
MINimum	Minimum status
When omitted	Active status

Example of Use

To select this application measurement software with the window status active.

`INST:SYST WCDMAUL,ACT`

:INSTrument:SYSTem? WCDMAUL

Application Switch And Window Status Query

Function

Queries the Application status.

Query

:INSTrument:SYSTem? <apl_name>

Response

<status>,<window>

Parameter

<apl_name>	Application
WCDMAUL	This application measurement software
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
CONFIG	Config
<status>	Application status
CURR	In execution and targeted for control
RUN	In execution and not targeted for control
IDLE	Loaded but not executed.
UNL	Not loaded.
<window>	Window status
ACT	Active status
INAC	Non active status
MIN	Minimum status
NON	Not displayed

Example of Use

To query the status of this application.

```
INST:SYST? WCDMAUL  
> CURR,ACT
```

2.1.3 Initialization

:INSTrument:DEFault

Preset Current Application

Function

Initializes the setting and status of the presently selected application.

Command

```
:INSTrument:DEFault
```

Details

The parameter of Signal Analyzer/Spectrum Analyzer is initialized, when the ACP/Channel Power/OBW measurement function is selected by the following commands after :INST:DEF has been sent by this application.

```
:CONFigure[:FFT|SWEpt]:ACP
:CONFigure[:FFT|SWEpt]:CHPower
:CONFigure[:FFT|SWEpt]:OBWidth
:CONFigure[:SWEpt]:SEMask
```

Example of Use

To initialize the setting and status of the presently selected application.

```
INST:DEF
```

:SYSTem:PRESet

Preset Current Application

Function

Initializes the setting and status of the presently selected application.

Refer to :INSTrument:DEFault.

Example of Use

To initialize the setting and status of the presently selected application.

```
SYST:PRES
```

2.2 Setting Basic Parameter

This section describes the parameters applied in common to this application, such as frequency and level.

Table 2.2-1 Basic Parameter Settings

Parameter	Device message
Carrier Frequency	<code>[:SENSE] :FREQuency:CENTer <freq></code>
	<code>[:SENSE] :FREQuency:CENTer?</code>
Input Level	<code>[:SENSE] :POWer [:RF] :RANGe:ILEVel <real></code>
	<code>[:SENSE] :POWer [:RF] :RANGe:ILEVel?</code>
Reference Level (Remote only)	<code>:DISPlay:WINDow[1]:TRACe:Y[:SCALE]:RLEVel <real></code>
	<code>:DISPlay:WINDow[1]:TRACe:Y[:SCALE]:RLEVel?</code>
Level Offset	<code>:DISPlay:WINDow[1]:TRACe:Y[:SCALE]:RLEVel:OFFSet <rel_power></code>
	<code>:DISPlay:WINDow[1]:TRACe:Y[:SCALE]:RLEVel:OFFSet?</code>
Level Offset State	<code>:DISPlay:WINDow[1]:TRACe:Y[:SCALE]:RLEVel:OFFSet:STATE OFF ON 0 1</code>
	<code>:DISPlay:WINDow[1]:TRACe:Y[:SCALE]:RLEVel:OFFSet:STATE?</code>
Pre-Amp State	<code>[:SENSE] :POWer [:RF] :GAIN [:STATE] OFF ON 0 1</code>
	<code>[:SENSE] :POWer [:RF] :GAIN [:STATE] ?</code>

2.2.1 Carrier Frequency

`[[:SENSE]:FREQUENCY:CENTER <freq>`

Carrier Frequency

Function

Sets the carrier frequency.

Command

`[[:SENSE]:FREQUENCY:CENTER <freq>`

Parameter

<code><freq></code>	Carrier frequency
Range	100 MHz to the upper limit of the main unit
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ Hz is used when omitted.
Initial value	1920 MHz

Example of Use

To set the carrier frequency to 1.945 GHz.
`FREQ:CENT 1.945GHZ`

[:SENSE] :FREQUENCY :CENTER ?

Carrier Frequency Query

Function

Queries the carrier frequency.

Command

[:SENSE] :FREQUENCY :CENTER ?

Response

<freq>

Parameter

<freq>	Carrier frequency
Range	100 MHz to the upper limit of the main unit
Resolution	1 Hz
	Value returned in Hz units.

Example of Use

To query the carrier frequency.
FREQ:CENT?
> 1920000000

2.2.2 Input Level

`[[:SENSE]:POWER[:RF]:RANGE:ILEVEL <real>`

Input Level

Function

Sets the input level of RF signals.

Command

`[[:SENSE]:POWER[:RF]:RANGE:ILEVEL <real>`

Parameter

<real>	Input Level
Range	-60.00 + Offset to 30.00 + Offset (Pre-Amp Off) -80.00 + Offset to 10.00 + Offset (Pre-Amp On)
Resolution	0.01 dB
Suffix Code	DBM
	dBm is used when omitted.
Initial value	-10.00 dBm

Details

The setting range when Pre Amp is Off is applied if the MS2690A/MS2691A/MS2692A Option 008/108 6 GHz Preamplifier or MS2830A Option 008/208 Preamplifier (hereinafter referred to as "Option 008") is not installed.

Example of Use

To set the input level to -15.00 dBm.
`POW:RANG:ILEV -15.00DBM`

`[[:SENSE]:POWER[:RF]:RANGE:ILEVEL?`

Input Level Query

Function

Queries the input level of RF signals.

Command

`[[:SENSE]:POWER[:RF]:RANGE:ILEVEL?`

Parameter

<code><real></code>	Input Level
Range	-60.00 + Offset to 30.00 + Offset (Pre-Amp Off) -80.00 + Offset to 10.00 + Offset (Pre-Amp On)
Resolution	0.01 dB
	Value returned in dBm units.

Example of Use

To query the input level.
`POW:RANG:ILEV?`
> -15.00

2.2.3 Reference Level

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

Reference Level

Function

Sets the reference level for ACP/Channel Power/OBW/SEM measurements.

Command

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

Parameter

<real>	Reference Level
Range	Input Level minimum value +10 to Input Level maximum value +10 dB
Resolution	0.01 dB
Suffix code	DBM
	dBm is used when omitted.
Initial value	0.00 dBm

Details

Reference Level indicates the peak level of the input signal by using the internal parameter which is automatically calculated to Input Level and is not shown on the screen. This Reference level value is applied to the measurement function when invoking ACP/Channel Power/OBW /SEM measurement functions. The Input Level value is also changed when the Reference Level is changed.

Example of Use

To set the reference level to 0.00 dBm.
 DISP:WIND:TRAC:Y:RLEV 0.00DBM

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel?

Reference Level Query

Function

Queries the reference levels of ACP/Channel Power/OBW/SEM measurements.

Command

```
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel?
```

Parameter

<real>	Reference Level
Range	Input Level minimum value +10 to Input Level maximum value +10 dB
Resolution	0.01 dB
	Value returned in dBm units.

Example of Use

```
To query the reference level.  
DISP:WIND:TRAC:Y:RLEV?  
> 0.00
```

2.2.4 Level Offset

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power>

Level Offset

Function

Sets the offset value of the input level.

Command

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

Parameter

<rel_power>	Level Offset
Range	-99.99 to +99.99 dB
Resolution	0.01 dB
Suffix code	dB
	dB is used when omitted.
Initial value	0.00 dB

Example of Use

```
To set the level offset to 0.50 dB.  
DISP:WIND:TRAC:Y:RLEV:OFFS 0.5
```

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?

Level Offset Query

Function

Queries the offset value of the input level.

Command

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?

Parameter

<rel_power>	Level Offset
Range	-99.99 to +99.99 dB
Resolution	0.01 dB

Example of Use

To query the setting of the level offset.
 DISP:WIND:TRAC:Y:RLEV:OFFS?
 > 0.50

2.2.5 Level Offset State

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF|ON|0|1

Level Offset State

Function

Enables/disables the offset value of the input level.

Command

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe
 <switch>

Parameter

<switch>	Level Offset State
OFF 0	Off (Initial value)
ON 1	On

Example of Use

To enable the offset value of the input level.
 DISP:WIND:TRAC:Y:RLEV:OFFS:STAT 1

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?

Level Offset State Query

Function

Queries whether offset of the input level is enabled.

Command

```
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?
```

Parameter

<switch>	Level Offset State
OFF 0	Off (Initial value)
ON 1	On

Example of Use

To query whether offset of the input level is enabled.

```
DISP:WIND:TRAC:Y:RLEV:OFFS:STAT?
```

```
> 1
```

2.2.6 Pre Amp

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

Pre Amp

Function

Sets Pre-amp On/Off.

Command

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

Parameter

<switch>	Pre-amp On/Off
OFF 0	Off(Initial value)
ON 1	On

Details

This command is disabled when the Option 008 is not loaded.

Example of Use

To set Preamplifier On.

```
POW:GAIN ON
```


[[:SENSE]:POWER[:RF]:GAIN[:STATE]?]

Pre Amp Query

Function

Queries Pre-amp On/Off.

Query

[:SENSE]:POWER[:RF]:GAIN[:STATE]?

Response

<switch>

Parameter

<switch>	Preamplifier On/Off
0	Off
1	On

Details

Returns an Off value when the Option 008 is not loaded.

Example of Use

To query the setting of the Preamplifier.

```

POW:GAIN?
> 1

```

2.3 Setting System Parameter

Table 2.3-1 lists the device messages for setting the parameters on the communication system targeted for measurement. These parameters are applied in common to Modulation/Code Domain measurements.

Table 2.3-1 Setting System Parameters

Function	Device Message
Scrambling Code	[:SENSe] :EVM:SYNC:SCRamble <integer>
	[:SENSe] :EVM:SYNC:SCRamble?
	[:SENSe] :RHO:SYNC:SCRamble:MS <integer>
	[:SENSe] :RHO:SYNC:SCRamble:MS?
	[:SENSe] :CDPower:SYNC:SCRamble:MS <integer>
	[:SENSe] :CDPower:SYNC:SCRamble:MS?
Transient Periods	[:SENSe] :EVM:SWEep:TIME:TRANSient INCLude EXCLude
	[:SENSe] :EVM:SWEep:TIME:TRANSient?
	[:SENSe] :RHO:SWEep:TIME:TRANSient INCLude EXCLude
	[:SENSe] :RHO:SWEep:TIME:TRANSient?
Origin Offset	[:SENSe] :EVM:ORIGin INCLude EXCLude
	[:SENSe] :EVM:ORIGin?
Active Code Threshold	:CALCulate:EVM:ASET:THReshold <rel_ampl>
	:CALCulate:EVM:ASET:THReshold?
	:CALCulate:RHO:ASET:THReshold <rel_ampl>
	:CALCulate:RHO:ASET:THReshold?

2.3.1 Scrambling Code

`[:SENSe]:EVM:SYNC:SCRamble <integer>`

Scrambling Code

Function

Sets the Scrambling Code.

Command

`[:SENSe]:EVM:SYNC:SCRamble <integer>`

Parameter

<code><integer></code>	Scrambling Code
Range	0 to 16777215 (0x0 to 0xFFFFFFFF)
Resolution	1
Initial value	0

Details

Values with the prefix “#” are settings value input hexadecimal.

Example of Use

To set the Scrambling Code to FFFFFFFF.
`EVM:SYNC:SCR #FFFFFFF`

Related command

The following commands operate the same parameter.
`[:SENSe]:RHO:SYNC:SCRamble:MS <integer>`
`[:SENSe]:CDPower:SYNC:SCRamble:MS <integer>`

[[:SENSe]:EVM:SYNC:SCRamble?

Scrambling Code Query

Function

Queries the Scrambling Code. The response is fixed to decimal.

Query

```
[[:SENSe]:EVM:SYNC:SCRamble?
```

Response

```
<integer>
```

Parameter

<integer>	Scrambling Code
Range	0 to 16777215 (decimal)
Resolution	1

Example of Use

To query the Scrambling Code.

```
EVM:SYNC:SCR?  
> 16777215
```

Related Command

The following commands operate the same parameter.

```
[[:SENSe]:RHO:SYNC:SCRamble:MS?  
[[:SENSe]:CDPower:SYNC:SCRamble:MS?
```

[[:SENSe]:RHO:SYNC:SCRamble:MS <integer>

Scrambling Code

Function

Sets the Scrambling Code.

Refer to [[:SENSe]:EVM:SYNC:SCRamble <integer>.

Related Command

The following commands operate the same parameter.

```
[[:SENSe]:EVM:SYNC:SCRamble <integer>  
[[:SENSe]:CDPower:SYNC:SCRamble:MS <integer>
```

`[:SENSe]:RHO:SYNC:SCRamble:MS?`

Scrambling Code Query

Function

Queries the Scrambling Code.

Refer to `[:SENSe]:EVM:SYNC:SCRamble?`.

Related Command

The following commands operate the same parameter.

`[:SENSe]:EVM:SYNC:SCRamble?`

`[:SENSe]:CDPower:SYNC:SCRamble:MS?`

`[:SENSe]:CDPower:SYNC:SCRamble:MS <integer>`

Scrambling Code

Function

Sets the Scrambling Code.

Refer to `[:SENSe]:EVM:SYNC:SCRamble <integer>`.

Related Command

The following commands operate the same parameter.

`[:SENSe]:EVM:SYNC:SCRamble <integer>`

`[:SENSe]:RHO:SYNC:SCRamble:MS <integer>`

`[:SENSe]:CDPower:SYNC:SCRamble:MS?`

Scrambling Code Query

Function

Queries the Scrambling Code.

Refer to `[:SENSe]:EVM:SYNC:SCRamble?`.

Related Command

The following commands operate the same parameter.

`[:SENSe]:EVM:SYNC:SCRamble?`

`[:SENSe]:RHO:SYNC:SCRamble:MS?`

2.3.2 Transient Periods

`[[:SENSe]:EVM:SWEep:TIME:TRANSient INCLude|EXCLude`

Transient Period

Function

This sets whether to include or exclude the Transient Periods (25 μ s before and after slot boundary) for the measurement target.

Command

`[[:SENSe]:EVM:SWEep:TIME:TRANSient <mode>`

Parameter

<mode>	Transient Periods
INCLude	Including Transient Periods. (Initial value)
EXCLude	Excluding Transient Periods.

Example of Use

To set to include Transient Periods.
`EVM:SWE:TIME:TRAN INCL`

Related Command

The following command operates the same parameter.
`[[:SENSe]:RHO:SWEep:TIME:TRANSient INCLude|EXCLude`

[:SENSe] :EVM :SWEep :TIME :TRANsient ?

Transient Periods Query

Function

This command queries the Transient Periods settings.

Query

`[:SENSe] :EVM :SWEep :TIME :TRANsient <mode>`

Response

<mode>

Parameter

<mode>	Transient Period
INCL	Including Transient Period.
EXCL	Excluding Transient Period.

Example of Use

To query the Transient Period.

```
EVM :SWE :TIME :TRAN?
> INCL
```

Related Command

The following command operates the same parameter.

`[:SENSe] :RHO :SWEep :TIME :TRANsient ?`**[:SENSe] :RHO :SWEep :TIME :TRANsient INCLude|EXCLude**

Transient Period

Function

Sets whether to include Transient Period as a measurement target.

Refer to `[:SENSe] :EVM :SWEep :TIME :TRANsient <mode>`.

Related Command

The following command operates the same parameter.

`[:SENSe] :EVM :SWEep :TIME :TRANsient INCLude|EXCLude`

`[:SENSe]:RHO:SWEep:TIME:TRANsient?`

Transient Period Query

Function

Queries the Transient Period.

Refer to `[:SENSe]:EVM:SWEep:TIME:TRANsient <mode>`.

Related Command

The following command operates the same parameter.

`[:SENSe]:EVM:SWEep:TIME:TRANsient?`

2.3.3 Origin Offset

`[:SENSe]:EVM:ORIGin INCLude|EXCLude`

Origin Offset

Function

Sets whether to include the Origin Offset for calculating EVM.

Command

`[:SENSe]:EVM:ORIGin INCLude|EXCLude`

Parameter

<code><mode></code>	EVM Origin Offset
<code>INCLude</code>	Including Origin Offset.(Initial value)
<code>EXCLude</code>	Excluding Origin Offset.

Example of Use

To set to include the Origin Offset for calculating EVM.

`EVM:ORIG INCL`

[[:SENSE]:EVM:ORIGIN?

EVM Origin Offset Query

Function

Queries the EVM Origin Offset.

Query

[:SENSE]:EVM:ORIGIN?

Parameter

<mode>	EVM Origin Offset
INCL	Including Origin Offset.
EXCL	Excluding Origin Offset.

Example of Use

```
To query the EVM Origin Offset.
EVM:ORIG?
> INCL
```

2.3.4 Active Code Threshold**:CALCulate:EVM:ASET:THReshold <rel_ampl>**

Active Code Threshold

Function

Sets the Active Code Threshold.

Command

:CALCulate:EVM:ASET:THReshold <rel_ampl>

Parameter

<rel_ampl>	Active Code Threshold
Range	-10.0 to -40.0 dB
Resolution	0.1 dB
Suffix code	DB
	dB is used when omitted.
Initial value	-30.0 dB

Example of Use

```
To set the Active Code Threshold to -20.0 dB.
CALC:EVM:ASET:THR -20.0
```

Related Command

The following command operates the same parameter.

```
:CALCulate:RHO:ASET:THReshold <rel_ampl>
```

:CALCulate:EVM:ASET:THReshold?

Active Code Threshold Query

Function

Queries the Active Code Threshold.

Query

:CALCulate:EVM:ASET:THReshold?

Parameter

<rel_ampl>	Active Code Threshold
Range	-10.0 to -40.0 dB
Resolution	0.1 dB
	Value returned in dB units.

Example of Use

To query the Active Code Threshold.

```
CALC:EVM:ASET:THR?  
> -20.0
```

Related Command

The following command operates the same parameter.

:CALCulate:RHO:ASET:THReshold?

:CALCulate:RHO:ASET:THReshold <rel_ampl>

Active Code Threshold

Function

Sets the Active Code Threshold.

Refer to :CALCulate:EVM:ASET:THReshold <rel_ampl>.

Related Command

The following command operates the same parameter.

:CALCulate:EVM:ASET:THReshold <rel_ampl>

:CALCulate:RHO:ASET:THReshold?

Active Code Threshold Query

Function

Queries the Active Code Threshold.

Refer to :CALCulate:EVM:ASET:THReshold?.

Related Command

The following command operates the same parameter.

:CALCulate:EVM:ASET:THReshold?

2.4 Utility Function

Table 2.4-1 lists the device messages for setting parameters on the communication system of measurement targets.

Table 2.4-1 Utility Function

Function	Device Message
Erase Warm Up Message	:DISPlay:ANNotation:WUP:ERASe
Display Title	:DISPlay:ANNotation:TITLe[:STATe] ON OFF 1 0
	:DISPlay:ANNotation:TITLe[:STATe]?
Title Entry	:DISPlay:ANNotation:TITLe:DATA <string>
	:DISPlay:ANNotation:TITLe:DATA?

2.4.1 Erase Warm Up Message

:DISPlay:ANNotation:WUP:ERASe

Erase Warm Up Message

Function

To erase the warm up messages displayed right after activation.

Command

:DISPlay:ANNotation:WUP:ERASe

Example of Use

To erase the warm up messages.

DISP:ANN:WUP:ERAS

2.4.2 Display Title

:DISPlay:ANNotation:TITLe[:STATe] OFF|ON|0|1

Display Title

Function

Sets the title display On/Off.

Command

:DISPlay:ANNotation:TITLe[:STATe] <switch>

Parameter

<switch>	Title display On/Off
OFF 0	Off (Initial value)
ON 1	On

Example of Use

To display the title.

DISP:ANN:TITL ON

:DISPlay:ANNotation:TITLe[:STATe]?

Display Title Query

Function

Queries On/Off of the title display.

Query

:DISPlay:ANNotation:TITLe[:STATe]?

Response

<switch>

Parameter

<switch>	Title display On/Off
0	Off
1	On

Example of Use

To query the setting of the title display.
DISP:ANN:TITL?
> 1

2.4.3 Title Entry

:DISPlay:ANNotation:TITLe:DATA <string>

Title Entry

Function

Registers the title character string.

Command

:DISPlay:ANNotation:TITLe:DATA <string>

Parameter

<string>	Character string within 32 characters enclosed by double quotation marks (“ ”) or single quotation marks (‘ ’)
----------	--

Example of Use

To set the title character string.
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 quotation marks (“ ”) or single quotation marks (‘ ’)

Example of Use

To query the title character string.

```
DISP:ANN:TITL:DATA?
```

```
> TEST
```

2.5 Common Measurement Function

Table 2.5-1 lists the device messages for carrying out common operations in each measurement function.

Table 2.5-1 Common Measurement Function

Function	Device Message
Continuous Measurement	:INITiate:CONTinuous OFF ON 0 1
	:INITiate:CONTinuous?
	:INITiate:MODE:CONTinuous
Single Measurement	:INITiate:MODE:SINGLE
Initiate	:INITiate[:IMMediate]
Configure	:CONFigure?
Trigger Switch	:TRIGger[:SEquence][:STATe] ON OFF 1 0
	:TRIGger[:SEquence][:STATe]?
Trigger Source	:TRIGger[:SEquence]:SOURce EXTernal[1] IMMediate SG
	:TRIGger[:SEquence]:SOURce?
	:TRIGger:RHO[:SEquence]:SOURce EXTernal[1] IMMediate SG
	:TRIGger:RHO[:SEquence]:SOURce?
	:TRIGger:CDPower[:SEquence]:SOURce EXTernal[1] IMMediate SG
	:TRIGger:CDPower[:SEquence]:SOURce?
Trigger Slope	:TRIGger[:SEquence]:SLOPe POSitive NEGative
	:TRIGger[:SEquence]:SLOPe?
	:TRIGger[:SEquence]:EXTernal[1]:SLOPe POSitive NEGative
	:TRIGger[:SEquence]:EXTernal[1]:SLOPe?
Trigger Delay	:TRIGger[:SEquence]:DELay <time>
	:TRIGger[:SEquence]:DELay?
	:TRIGger[:SEquence]:EXTernal[1]:DELay <time>
	:TRIGger[:SEquence]:EXTernal[1]:DELay?

Note:

The trigger setting is saved for each application and is commonly applied to the measurement functions in the application. Thus, when a trigger setting has been performed by the Modulation measurement function or Code Domain measurement function, the same setting will be applied to both measurements.

2.5.1 Measure and Control

:INITiate:CONTinuous OFF|ON|0|1

Continuous Measurement

Function

Switches Single/Continuous for measurement.

Command

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

Parameter

<switch>	Measurement mode
0 OFF	Single measurement
1 ON	Continuous measurement (Initial value)

Details

Starts a measurement when it is set to On and is in Continuous, and does not start a measurement when set to Off and in Single.

Example of Use

To execute Continuous measurement.
INIT:CONT ON

:INITiate:CONTinuous?

Continuous Measurement Query

Function

Queries the measurement mode.

Query

```
:INITiate:CONTinuous?
```

Response

```
<switch>
```

Parameter

<switch>	Capture mode
0	Single measurement
1	Continuous measurement

Example of Use

To query the setting of the measurement.
INIT:CONT?
> 0

:INITiate:MODE:CONTInuous

Continuous Measurement

Function

Starts continuous measurement.

Command

`:INITiate:MODE:CONTInuous`

Example of Use

To execute continuous measurement.

`INIT:MODE:CONT`

:INITiate:MODE:SINGle

Single Measurement

Function

Starts Single measurement.

Command

`:INITiate:MODE:SINGle`

Example of Use

To execute Single measurement.

`INIT:MODE:SING`

:INITiate[:IMMEDIATE]

Initiate

Function

Initiates the measurement in the present measurement mode.

Command

`:INITiate:[IMMEDIATE]`

Example of Use

To start the measurement.

`INIT`

:CONFigure?

Configure Query

Function

Queries the name of the present measurement function.

Query

```
:CONFigure?
```

Response

```
<mode>
```

Parameter

<mode>	Measurement function
EVM	Modulation measurement
CDP	Code Domain measurement

Example of Use

```
To query the name of the measurement function.
CONF?
> EVM
```

2.5.2 Trigger Switch

:TRIGger[:SEQuence][:STATe] OFF|ON|0|1

Trigger Switch

Function

Sets the trigger wait On/Off.

Command

`:TRIGger[:SEQuence][:STATe] <switch>`

Parameter

<code><switch></code>	On/Off of trigger wait
<code>OFF 0</code>	Off (Initial value)
<code>ON 1</code>	On

Example of Use

To set to the trigger wait.
`TRIG ON`

:TRIGger[:SEQuence][:STATe]?

Trigger Switch Query

Function

Queries On/Off of the trigger wait.

Query

`:TRIGger[:SEQuence][:STATe]?`

Response

`<switch>`

Parameter

<code><switch></code>	On/Off of trigger wait
<code>0</code>	Off
<code>1</code>	On

Example of Use

To query the setting of the trigger wait.
`TRIG?`
`> 0`

2.5.3 Trigger Source

`:TRIGger[:SEQuence]:SOURce EXTernal[1]|IMMediate|SG`

Trigger Source

Function

Selects the trigger signal source.

Command

`:TRIGger[:SEQuence]:SOURce <source>`

Parameter

<code><source></code>	Trigger Source
<code>EXTernal[1]</code>	External input (External)
<code>IMMediate</code>	Free run
<code>SG</code>	SG Marker

Details

SG marker can be selected only when the Option Vector Signal Generator is loaded.

Example of Use

To set the trigger signal source to external input.
`TRIG:SOUR EXT`

Related Command

The following commands operate the same parameter.

`:TRIGger:RHO[:SEQuence]:SOURce EXTernal[1]|IMMediate|SG`

`:TRIGger:CDPower[:SEQuence]:SOURce
 EXTernal[1]|IMMediate|SG`

:TRIGger[:SEQuence]:SOURce?

Trigger Source Query

Function

Queries the trigger signal source.

Query

:TRIGger[:SEQuence]:SOURce?

Response

<source>

Parameter

<source>	Trigger Source
EXT	External input (External)
IMM	Free run
SG	SG Marker

Details

SG marker can be selected only when the Option Vector Signal Generator is loaded.

Example of Use

To query the trigger signal source.
TRIG:SOUR?
> EXT

Related Command

The following commands operate the same parameter.
:TRIGger:RHO[:SEQuence]:SOURce?
:TRIGger:CDPower[:SEQuence]:SOURce?

:TRIGger:RHO[:SEQuence]:SOURce EXTernal[1]|IMMEDIATE|SG

Trigger Source

Function

Selects the trigger signal source.

Refer to TRIGger[:SEQuence]:SOURce <source>.

Related Command

The following commands operate the same parameter.
:TRIGger[:SEQuence]:SOURce EXTernal[1]|IMMEDIATE|SG
:TRIGger:CDPower[:SEQuence]:SOURce
EXTernal[1]|IMMEDIATE|SG

:TRIGger:RHO[:SEQuence]:SOURce?

Trigger Source Query

Function

Queries the trigger signal source.

Refer to `TRIGger[:SEQuence]:SOURce?`.

Related Command

The following commands operate the same parameter.

`:TRIGger[:SEQuence]:SOURce?`

`:TRIGger:CDPower[:SEQuence]:SOURce?`

:TRIGger:CDPower[:SEQuence]:SOURce EXTernal[1]|IMMediate|SG

Trigger Source

Function

Selects the trigger signal source.

Refer to `TRIGger[:SEQuence]:SOURce <source>`.

Related Command

The following commands operate the same parameter.

`:TRIGger[:SEQuence]:SOURce EXTernal[1]|IMMediate|SG`

`:TRIGger:RHO[:SEQuence]:SOURce EXTernal[1]|IMMediate|SG`

:TRIGger:CDPower[:SEQuence]:SOURce?

Trigger Source Query

Function

Queries the trigger signal source.

Refer to `TRIGger[:SEQuence]:SOURce?`.

Related Command

The following commands operate the same parameter.

`:TRIGger[:SEQuence]:SOURce?`

`:TRIGger:RHO[:SEQuence]:SOURce?`

2.5.4 Trigger Slope

`:TRIGger[:SEQuence]:SLOPe POSitive|NEGative`

Trigger Slope

Function

Sets the trigger detection mode (rising/falling).

Command

`:TRIGger[:SEQuence]:SLOPe <mode>`

Parameter

<code><mode></code>	Trigger detection mode
<code>POSitive</code>	Detects at the rising edge (Initial value).
<code>NEGative</code>	Detects at the falling edge.

Example of Use

To detect a trigger at the rising edge.

`TRIG:SLOP POS`

Related Command

The following command operates the same parameter.

`:TRIGger[:SEQuence]:EXTernal[1]:SLOPe POSitive|NEGative`

:TRIGger[:SEquence]:SLOPe?

Trigger Slope Query

Function

Queries the trigger detection mode (rising/falling).

Query

`:TRIGger[:SEquence]:SLOPe?`

Response

<mode>

Parameter

<mode>	Trigger detection mode
POS	Detects at the rising edge.
NEG	Detects at the falling edge.

Example of Use

To query the trigger detection mode.

`TRIG:SLOP?``> POS`

Related Command

The following command operates the same parameter.

`:TRIGger[:SEquence]:EXTernal[1]:SLOPe?`**:TRIGger[:SEquence]:EXTernal[1]:SLOPe POSitive|NEGative**

Trigger Slope

Function

Sets the trigger detection mode (rising/falling).

Refer to `:TRIGger[:SEquence]:SLOPe`.

Related Command

The following command operates the same parameter.

`:TRIGger[:SEquence]:SLOPe POSitive|NEGative`

:TRIGger[:SEQuence]:EXTernal[1]:SLOPe?

Trigger Slope Query

Function

Queries the trigger detection mode (rising/falling).

Refer to :TRIGger[:SEQuence]:SLOPe?.

Related Command

The following command operates the same parameter.

:TRIGger[:SEQuence]:SLOPe?

2.5.5 Trigger Delay

:TRIGger[:SEQuence]:DELay <time>

Trigger Delay

Function

Sets the delay time from generating the trigger to the starting position of the frame.

Command

:TRIGger[:SEQuence]:DELay <time>

Parameter

<time>	Delay time from generating the trigger to starting the capture
Range	-2 to +2 seconds
Resolution	20 nanoseconds
Suffix code	NS, US, MS, S second is used when omitted.
Initial value	0 second

Example of Use

To set the trigger delay time to 20 ms.

```
TRIG:DEL 20MS
```

Related Command

The following command operates the same parameter.

:TRIGger[:SEQuence]:EXTernal[1]:DELay

:TRIGger[:SEQuence]:DELay?

Trigger Delay Query

Function

Queries the setting of the delay time from generating the trigger to the starting position of the frame.

Query

```
:TRIGger[:SEQuence]:DELay?
```

Response

```
<time>
```

Parameter

```
<time>
```

Delay time from generating the trigger to starting the capture.

Range -2 to +2 seconds

Resolution 20 nanoseconds

Value returned in s units.

Example of Use

To query the trigger delay time.

```
TRIG:DEL?
```

```
> 0.02
```

Related Command

The following command operates the same parameter.

```
:TRIGger[:SEQuence]:EXTernal[1]:DELay?
```

:TRIGger[:SEQuence]:EXTErnal[1]:DELay <time>

Trigger Delay

Function

Sets the delay time from generating the trigger to starting the capture.

Refer to :TRIGger[:SEQuence]:DELay.

Related Command

The following command operates the same parameter.

:TRIGger[:SEQuence]:DELay <time>

:TRIGger[:SEQuence]:EXTErnal[1]:DELay?

Trigger Delay Query

Function

Queries the delay time from generating the trigger to starting the capture.

Refer to :TRIGger[:SEQuence]:DELay?.

Related Command

The following command operates the same parameter.

:TRIGger[:SEQuence]:DELay?

2.6 ACP/Channel Power/OBW/SEM Measurement Function

Table 2.6-1 lists the device messages for invoking ACP/Channel Power/OBW/SEM measurement functions. The applications to be used (Signal Analyzer or Spectrum Analyzer) must be activated in advance.

Refer to “MS2690/MS2691/MS2692A and MS2830A Signal Analyzer Operation Manual (Signal Analyzer Function Remote Control)” or “MS2690/MS2691/MS2692A and MS2830A Signal Analyzer Operation Manual (Signal Analyzer Operation Manual (Spectrum Analyzer Function Remote Control))” for commands/queries to be used for control after these measurement functions has been invoked.

Table 2.6-1 Invoking of ACP/Channel Power/OBW/SEM Functions

Function	Device Message
Configure - ACP	:CONFigure[:FFT SWEpt]:ACP
Configure - Channel Power	:CONFigure[:FFT SWEpt]:CHPower
Configure - OBW	:CONFigure[:FFT SWEpt]:OBWidth
Configure - SEM	:CONFigure[:SWEpt]:SEMAsk
Using application for ACP	[:SENSe]:ACPower:INSTRument[:SElect] FFT SWEpt
	[:SENSe]:ACPower:INSTRument[:SElect]?
Using application for Channel Power	[:SENSe]:CHPower:INSTRument[:SElect] FFT SWEpt
	[:SENSe]:CHPower:INSTRument[:SElect]?
Using application for OBW	[:SENSe]:OBWidth:INSTRument[:SElect] FFT SWEpt
	[:SENSe]:OBWidth:INSTRument[:SElect]?

Note:

FETCh:<measure>, INITiate:<measure>, READ:<measure>, and MEASure:<measure>FETCh:<measure> cannot be used when this measurement application is selected, except for Modulation/Code Domain measurement. The commands/queries can be used when Signal Analyzer or Spectrum Analyzer is selected after executing CONFigure:<measure>.

:CONFigure[:FFT|SWEPT]:ACP

ACP

Function

Selects ACP measurement function.

The measurement mode can be set by

[:SENSE] :ACPower :INSTrument [:SElect] FFT | SWEPT, if FFT or SWEPT is omitted.

Command

:CONFigure [:FFT | SWEPT] :ACP

Details

This command only selects the measurement function and does not start measurement.

For MS2830A: To perform FFT measurement using the Signal Analyzer function with this command, the analysis bandwidth option 31.25 MHz or greater is required in all cases.

Example of Use

To select the ACP measurement function of Spectrum Analyzer.

CONF : SWEPT : ACP

:CONFigure[:FFT|SWEPT]:CHPower

Channel Power

Function

Selects the Channel Power measurement function.

The measurement mode to be used can be set by

`[:SENSe] :CHPower :INSTrument [:SElect] FFT | SWEpt`, if `FFT` or `SWEpt` is omitted.

Command

`:CONFigure [:FFT | SWEpt] :CHPower`

Details

This command only selects the measurement function and does not start measurement.

For MS2830A: To perform FFT measurement using the Signal Analyzer function with this command, the analysis bandwidth option 31.25 MHz or greater is required in all cases.

Example of Use

To select the Channel Power measurement function of Spectrum Analyzer.

`CONF : SWEPT : CHP`

:CONFigure[:FFT|SWEPT]:OBWidth

OBW

Function

Selects the OBW measurement function.

The measurement mode can be set by

[:SENSe] :OBWidth :INSTrument [:SElect] FFT | SWEpt, if FFT or SWEpt is omitted.

Command

```
:CONFigure[:FFT|SWEPT]:OBWidth
```

Details

This command only selects the measurement function and does not start measurement.

For MS2830A: To perform FFT measurement using the Signal Analyzer function with this command, the analysis bandwidth option 31.25 MHz or greater is required in all cases.

Example of Use

To select the OBW measurement function of Spectrum Analyzer.
CONF : SWEPT : OBW

:CONFigure[:FFT|SWEPT]:SEMask

Spurious Emission Mask

Function

Selects the Spurious Emission Mask measurement function.

Command

```
:CONFigure[:SWEPT]:SEMask
```

Details

This command only selects the measurement function and does not start measurement.

Example of Use

To select the Spurious Emission Mask measurement function of Spectrum Analyzer.
CONF : SEM

[[:SENSE]:ACPower:INSTrument[:SElect] FFT|SWEPT

Measurement Method for ACP

Function

Sets the measurement mode to be applied when :CONFigure:ACP is executed.

Command

[[:SENSE]:ACPower:INSTrument[:SElect] <mode>

Parameter

<mode>	Measurement mode
FFT	Signal Analyzer function
SWEPT	Spectrum Analyzer function (Initial Value)

Details

FFT can be set with MS2830A, however, to execute with CONFigure command, the analysis bandwidth option 31.25 MHz or greater is required.

Example of Use

To use Signal Analyzer when executing ACP.
 ACP:INST SWEPT

`[[:SENSE]:ACPower:INSTrument[:SElect]]?`

Measurement Method for ACP Query

Function

Queries the measurement mode to be applied when `:CONFigure:ACP` is executed.

Query

```
[[:SENSE]:ACPower:INSTrument[:SElect]]?
```

Response

```
<mode>
```

Parameter

<code><mode></code>	Measurement mode
<code>FFT</code>	Signal Analyzer function
<code>SWEP</code>	Spectrum Analyzer function

Details

FFT can be set with MS2830A, however, to execute with `CONFigure` command, the analysis bandwidth option 31.25 MHz or greater is required.

Example of Use

Queries the measurement mode to be applied when ACP measurement is executed.

```
ACP:INST?
```

```
> FFT
```

[[:SENSE]:CHPower:INSTrument[:SElect] FFT|SWEPT

Measurement Method for Channel Power

Function

Sets the measurement mode to be applied when :CONFigure:CHPower is executed.

Command

[[:SENSE]:CHPower:INSTrument[:SElect] <mode>

Parameter

<mode>	Measurement mode
FFT	Signal Analyzer function
SWEPT	Spectrum Analyzer function (Initial Value)

Details

FFT can be set with MS2830A, however, to execute with CONFigure command, the analysis bandwidth option 31.25 MHz or greater is required.

Example of Use

To use Signal Analyzer when executing Channel Power.
 CHP:INST SWEPT

[:SENSE] :CHPower :INSTrument [:SElect] ?

Measurement Method for Channel Power Query

Function

Queries the measurement mode to be applied when :CONFigure:CHPower is executed.

Command

```
[ :SENSE ] :CHPower :INSTrument [ :SElect ] ?
```

Response

<mode>

Parameter

<mode>	Measurement mode
FFT	Signal Analyzer function
SWEP	Spectrum Analyzer function

Details

FFT can be set with MS2830A, however, to execute with CONFigure command, the analysis bandwidth option 31.25 MHz or greater is required.

Example of Use

Queries the measurement mode to be applied when Channel Power measurement is executed.

```
CHP : INST ?  
> FFT
```

[[:SENSE]:OBWidth:INSTrument[:SElect] FFT|SWEPT

Measurement Method for OBW

Function

Sets the measurement mode to be applied when :CONFigure:OBWidth is executed.

Command

[[:SENSE]:OBWidth:INSTrument[:SElect] <mode>

Parameter

<mode>	Measurement mode
FFT	Signal Analyzer function
SWEPT	Spectrum Analyzer function (Initial Value)

Details

FFT can be set with MS2830A, however, to execute with CONFigure command, the analysis bandwidth option 31.25 MHz or greater is required.

Example of Use

To use Signal Analyzer when executing OBW.
 OBW:INST SWEPT

[[:SENSE]:OBWidth:INSTrument[:SElect]]?

Measurement Method for OBW Query

Function

Queries the measurement mode to be applied when `:CONFigure:OBWidth` is executed.

Command

```
[[:SENSE]:OBWidth:INSTrument[:SElect]]
```

Response

```
<mode>
```

Parameter

<mode>	Measurement mode
FFT	Signal Analyzer function
SWEP	Spectrum Analyzer function

Details

FFT can be set with MS2830A, however, to execute with `CONFigure` command, the analysis bandwidth option 31.25 MHz or greater is required.

Example of Use

Queries the measurement mode to be applied when OBW measurement is executed.

```
OBW:INST?
```

```
> FFT
```

2.7 Modulation Measurement Function

This section describes the device messages related to Modulation measurement.

Table 2.7-1 lists the commands to execute Modulation measurement and the queries to read the result.

Table 2.7-1 Device Messages for Executing Measurement and Reading Result

Function	Device Message
Configure	:CONFIgure:EVM
	:CONFIgure:RHO
Initiate	:INITiate:EVM
	:INITiate:RHO
Fetch	:FETCh:EVM[n] ?
	:FETCh:RHO [n] ?
Read/Measure	:READ:EVM [n] ?
	:READ:RHO [n] ?
	:MEASure:EVM [n] ?
	:MEASure:RHO [n] ?

Tables 2.7-2 lists the responses to parameter n in Table 2.7-1.

Table 2.7-2 Responses to Modulation Measurement Result

n	Result Mode	Response
1 or omitted	A	<p>Returns them with comma separated value format in the following order:</p> <ol style="list-style-type: none"> 1. RMS EVM [%] (Average value for Storage Count) 2. Peak EVM [%] (Maximum value for Storage Count) 3. Magnitude Error [%] (Average value for Storage Count) 4. Phase Error [degree] (Average value for Storage Count) 5. I/Q Origin Offset [dB] (Average value for Storage Count) 6. Frequency Error [Hz] (Average value for Storage Count) 7. Frequency Error [ppm] (Average value for Storage Count) 8. Peak CDE [dB] (Maximum value for Storage Count) 9. Code number at Peak CDE (Maximum value for Storage Count) 10. Branch at Peak CDE 11. Time Offset [chips] (Average value for Storage Count) <p>Note: when Trigger Switch is Off: -999.0</p> <ol style="list-style-type: none"> 12. -999.0 13. Mean Power [dBm] (Average value for Storage Count) 14. Peak Active CDE [dB] (Maximum value for Storage Count) 15. Code number at Peak Active CDE (Maximum value for Storage Count) 16. Spreading Factor at Peak Active CDE (Maximum value for Storage Count) 17. Branch at Peak Active CDE 18. Cubic Metrics [dB](Average for Storage Count)

Table 2.7-2 Responses to Modulation Measurement Result (Cont'd)

n	Result Mode	Response
1 or omitted	B	<p>Returns them with comma separated value format in the following order:</p> <ol style="list-style-type: none"> 1. EVM (RMS) [%] (Average value for Storage Count) 2. EVM (Peak) [%] (Maximum value for Storage Count) 3. Magnitude Error [%] (Average value for Storage Count) 4. Phase Error [degree] (Average value for Storage Count) 5. I/Q Origin Offset [dB] (Average value for Storage Count) 6. Frequency Error [Hz] (Average value for Storage Count) 7. -999.0 8. Peak CDE [dB] (Maximum value for Storage Count) 9. Code number at Peak CDE (Maximum value for Storage Count) 10. -999.0 11. Time Offset [chips] (Average value for Storage Count) <p>Note: when Trigger Switch is Off: -999.0</p> <ol style="list-style-type: none"> 12. -999.0 13. Mean Power [dBm] (Average value for Storage Count)
2	A/B	Returns the display data from the 0 chip to the 2559 chip of the EVM graph with comma separated value format. Unit: %
3	A/B	Returns the display data from the 0 chip to the 2559 chip of the Magnitude Error graph with comma separated value format. Unit: %
4	A/B	Returns the display data from the 0 chip to the 2559 chip of the Phase Error graph with comma separated value format. Unit: degree
5	A/B	Returns the display data from the 0 chip to the 2559 chip of the Constellation graph with comma separated value format. Unit: none

Table 2.7-2 Responses to Modulation Measurement Result (Cont'd)

n	Result Mode	Response
14	A	Returns average values for Storage Count with comma separated value format in the following order: 1. EVM (RMS) [%] 2. EVM (Peak) [%] 3. Magnitude Error [%] 4. Phase Error [degree] 5. I/Q Origin Offset [dB] 6. Frequency Error [Hz] 7. Frequency Error [ppm] 8. Peak CDE [dB] 9. Code number at Peak CDE 10. Branch at Peak CDE 11. Time Offset [chips] (when Trigger Switch is Off: -999.0) 12. -999.0 13. Mean Power [dBm] 14. Peak Active CDE [dB] 15. Code number at Peak Active CDE 16. Spreading Factor at Peak Active CDE 17. Branch at Peak Active CDE 18. Cubic Metrics [dB]
	B	Returns them with comma separated value format in the following order: 1. EVM (RMS) [%] 2. EVM (Peak) [%] 3. Magnitude Error [%] 4. Phase Error [degree] 5. I/Q Origin Offset [dB] 6. Frequency Error [Hz] 7. -999.0 8. Peak CDE [dB] 9. Code number at Peak CDE 10. -999.0 11. Time Offset [chips] 12. -999.0 13. Mean Power [dBm]

Table 2.7-2 Responses to Modulation Measurement Result (Cont'd)

n	Result Mode	Response
15	A	Returns maximum values to Storage Count with comma separated value format in the following order: <ol style="list-style-type: none"> 1. EVM (RMS) [%] 2. EVM (Peak) [%] 3. Magnitude Error [%] 4. Phase Error [degree] 5. I/Q Origin Offset [dB] 6. Frequency Error [Hz] 7. Frequency Error [ppm] 8. Peak CDE [dB] 9. Code number at Peak CDE 10. Branch at Peak CDE 11. Time Offset [chips] (when Trigger Switch is Off: -999.0) 12. -999.0 13. Mean Power [dBm] 14. Peak Active CDE [dB] 15. Code number at Peak Active CDE 16. Spreading Factor at Peak Active CDE 17. Branch at Peak Active CDE 18. Cubic Metrics [dB]
	B	Returns them with comma separated value format in the following order: <ol style="list-style-type: none"> 1. EVM (RMS) [%] 2. EVM (Peak) [%] 3. Magnitude Error [%] 4. Phase Error [degree] 5. I/Q Origin Offset [dB] 6. Frequency Error [Hz] 7. -999.0 8. Peak CDE [dB] 9. Code number at Peak CDE 10. -999.0 11. Time Offset [chips] 12. -999.0 13. Mean Power [dBm]

Table 2.7-2 Responses to Modulation Measurement Result (Cont'd)

n	Result Mode	Response
16	A	The minimum values for the Storage Count are returned with comma-separated value formats, in the following order: 1. -999.0 2. -999.0 3. -999.0 4. -999.0 5. -999.0 6. 999999999999 7. 999999999999 8. -999.0 9. -999.0 10. -999.0 11. -999.0 12. -999.0 13. Mean Power [dBm] 14. -999.0 15. -999.0 16. -999.0 17. -999.0 18. Cubic Metrics [dB]
	B	Responses are returned with comma-separated value formats in the following order: 1. -999.0 2. -999.0 3. -999.0 4. -999.0 5. -999.0 6. 999999999999 7. -999.0 8. -999.0 9. -999.0 10. -999.0 11. -999.0 12. -999.0 13. Mean Power [dBm]

Table 2.7-3 lists the commands to set parameters for Modulation measurement.

Table 2.7-3 Device Messages on Parameter Setting for Modulation Measurement

Parameter	Device Message
Starting Slot Number	:CALCulate:EVM:SWEep:START: <integer>
	:CALCulate:EVM:SWEep:START?
	:CALCulate:RHO:SWEep:OFFSet <integer>
	:CALCulate:RHO:SWEep:OFFSet?
Measurement Interval	:CALCulate:EVM:SWEep:INTerval <integer>
	:CALCulate:EVM:SWEep:INTerval?
Trace	:DISPlay:EVM[:VIEW][:SElect] EVM MAGNitude PHASe
	:DISPlay:EVM[:VIEW][:SElect]?
Target Slot Number	:DISPlay:EVM[:VIEW]:SLOT <integer>
	:DISPlay:EVM[:VIEW]:SLOT?
Scale – EVM	:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel 5 10 20 50
	:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel?
Scale – Magnitude Error	:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel 5 10 20 50
	:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel?
Scale – Phase Error	:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel 5 10 20 50
	:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel?
Storage Mode	[:SENSe]:EVM:AVERAge[:STATe] OFF ON AMAXimum 0 1 2
	[:SENSe]:EVM:AVERAge[:STATe]?
	[:SENSe]:RHO:AVERAge[:STATe] OFF ON AMAXimum 0 1 2
	[:SENSe]:RHO:AVERAge[:STATe]?
Storage Count	[:SENSe]:EVM:AVERAge:COUNT <integer>
	[:SENSe]:EVM:AVERAge:COUNT?
	[:SENSe]:RHO:AVERAge:COUNT <integer>
	[:SENSe]:RHO:AVERAge:COUNT?

Table 2.7-4 lists the commands/queries to read out values of marker setting/marker position for Modulation measurement.

Table 2.7-4 Device Messages for Marker of Modulation Measurement

Parameter	Device Message
Marker – On/Off	:CALCulate:EVM:MARKer[:STATE] OFF ON 0 1
	:CALCulate:EVM:MARKer[:STATE]?
Active Trace	:CALCulate:EVM:MARKer:ACTive CONSTellation BOTTom
	:CALCulate:EVM:MARKer:ACTive?
Constellation / Bottom Graph - Chip Number	:CALCulate:EVM:MARKer:CHIP <integer>
	:CALCulate:EVM:MARKer:CHIP?
Marker X axis Value	:CALCulate:EVM:MARKer:X?
Marker Y axis Value	:CALCulate:EVM:MARKer:Y?

2.7.1 Measure

:CONFigure:EVM

Modulation

Function

Selects the Modulation measurement function, and does not execute any measurement.

Command

:CONFigure:EVM

Example of Use

To select the Modulation measurement function.
CONF:EVM

Related Command

This command has the same operation as the following command.
:CONFigure:RHO

:CONFigure:RHO

Modulation

Function

Selects the Modulation measurement function, and does not execute any measurement.

Command

:CONFigure:RHO

Example of Use

To select the Modulation measurement function.
CONF:RHO

Related Command

This command has the same operation as the following command.
:CONFigure:EVM

:INITiate:EVM

Modulation

Function

Executes modulation measurement.

Command

:INITiate:EVM

Example of Use

To execute Modulation measurement.
INIT:EVM

Related Command

This command has the same operation as the following command.
:INITiate:RHO

:INITiate:RHO

Modulation

Function

Executes Modulation measurement.

Command

:INITiate:RHO

Example of Use

To execute Modulation measurement.

INIT:RHO

Related Command

This command has the same operation as the following command.

:INITiate:EVM

:FETCh:EVM[n]?

Modulation Query

Function

Queries the result of Modulation measurement.

Query

:FETCh:EVM[n]?

Response

Refer to Table 2.7-2.

Example of Use

To query the result of Modulation measurement.

FETC:EVM?

Related Command

This command has the same operation as the following command .

:FETCh:RHO[n]?

:FETCh:RHO[n]?

Modulation Query

Function

Queries the result of Modulation measurement.

Query

`:FETCh:RHO[n]?`

Response

Refer to Table 2.7-2.

Example of Use

To query the result of Modulation measurement.

`FETC:RHO?`

Related Command

This command has the same operation as the following command .

`:FETCh:EVM[n]?`**:READ:EVM[n]?**

Modulation Query

Function

Queries the result after executing Single measurement of Modulation measurement by the present setting value.

Query

`:READ:EVM[n]?`

Response

Refer to Table 2.7-2.

Example of Use

To query the result after executing Modulation measurement.

`READ:EVM?`

Related Command

This command has the same operation as the following commands .

`:MEASure:EVM[n]?``:READ:RHO[n]?``:MEASure:RHO[n]?`

:READ:RHO[n]?

Modulation Query

Function

Queries the result after executing Single measurement of Modulation measurement by the present setting value.

Query

:READ:RHO[n]?

Response

Refer to Table 2.7-2.

Example of Use

To query the result after executing Modulation measurement.
READ:RHO?

Related Command

This command has the same operation as the following commands .

:READ:EVM[n]?

:MEASure:EVM[n]?

:MEASure:RHO[n]?

:MEASure:EVM[n]?

Modulation Query

Function

Queries the result after executing Single measurement of Modulation measurement by the present setting value.

Query

`:MEAS:EVM[n]?`

Response

Refer to Table 2.7-2.

Example of Use

To query the result after executing Modulation measurement.

`MEAS:EVM?`

Related Command

This command has the same operation as the following commands.

`:READ:EVM[n]?``:READ:RHO[n]?``:MEASure:RHO[n]?`**:MEASure:RHO[n]?**

Modulation Query

Function

Queries the result after executing Single measurement of Modulation measurement by the present setting value.

Query

`:MEAS:RHO[n]?`

Response

Refer to Table 2.7-2.

Example of Use

To query the result after executing Modulation measurement.

`MEAS:RHO?`

Related Command

This command has the same operation as the following commands.

`:READ:EVM[n]?``:MEASure:EVM[n]?``:READ:RHO[n]?`

2.7.2 Starting Slot Number

:CALCulate:EVM:SWEep:STARt <integer>

Starting Slot Number

Function

Sets the starting slot position for Modulation measurement.

Command

:CALCulate:EVM:SWEep:STARt <integer>

Parameter

<integer>	Starting Slot Number
Range	0 to 14
Resolution	1
Initial value	1

Example of Use

To set the Starting Slot Number to 0.
CALC:EVM:SWE:STAR 0

:CALCulate:EVM:SWEep:STARt?

Starting Slot Number Query

Function

Queries the Starting Slot Number.

Query

:CALCulate:EVM:STARt?

Response

<integer>

Parameter

<integer>	Starting Slot Number
Range	0 to 14
Resolution	1

Example of Use

To query the Starting Slot Number.
CALC:EVM:SWE:STAR?
> 0

:CALCulate:RHO:SWEep:OFFSet <integer>

Starting Slot Number

Function

Sets the starting slot position for Modulation measurement.

Command

`:CALCulate:RHO:SWEep:OFFSet <integer>`

Parameter

<code><integer></code>	Starting Slot Number
Range	0 to 14
Resolution	1
Initial value	1

Example of Use

To set the Starting Slot Number to 0.

`CALC:RHO:SWE:OFFS 0`**:CALCulate:RHO:SWEep:OFFSet?**

Starting Slot Number Query

Function

Queries the Starting Slot Number.

Query

`:CALCulate:RHO:SWEep:OFFSet?`

Response

`<integer>`

Parameter

<code><integer></code>	Starting Slot Number
Range	0 to 14
Resolution	1

Example of Use

To query the Starting Slot Number.

`CALC:RHO:SWE:OFFS?``> 0`

2.7.3 Measurement Interval

:CALCulate:EVM:SWEep:INTerval <integer>

Measurement Interval

Function

Sets the continuous measurement interval for Modulation measurement in slot units.

Command

:CALCulate:EVM:SWEep:INTerval <integer>

Parameter

<integer>	Measurement Interval
Range	1 to 15 – Starting Slot Number
Resolution	1
Initial value	1

Example of Use

To set the Measurement Interval to 15.

CALC:EVM:SWE:INT 15

:CALCulate:EVM:SWEep:INTerval?

Measurement Interval Query

Function

Queries the Measurement Interval.

Query

:CALCulate:EVM:SWEep:INTerval?

Response

<integer>

Parameter

<integer>	Measurement Interval
Range	1 to 15 – Starting Slot Number
Resolution	1

Example of Use

To query the Measurement Interval.

CALC:EVM:SWE:INT?

> 15

2.7.4 Trace

:DISPlay:EVM[:VIEW][:SElect] EVM|MAGNitude|PHASe

Trace Mode

Function

Sets the graph type that is displayed in the lower Graph window when Modulation measurement is selected.

Command

```
:DISPlay:EVM[:VIEW] [:SElect] <mode>
```

Parameter

<mode>	Trace Mode
EVM	EVM vs Chip (Initial value)
MAGNitude	Mag. Error vs Chip
PHASe	Phase Error vs Chip

Example of Usef

To set Trace Mode to Phase Error.

```
DISP:EVM PHAS
```

:DISPlay:EVM[:VIEW][:SElect]?

Trace Mode Query

Function

Queries the graph type that is displayed in the lower Graph window when Modulation measurement is selected.

Query

```
:DISPlay:EVM[:VIEW] [:SElect]?
```

Parameter

<mode>	Trace Mode
EVM	EVM vs Chip
MAGN	Mag. Error vs Chip
PHAS	Phase Error vs Chip

Example of Use

To query the setting of Trace Mode.

```
DISP:EVM?
```

```
> PHAS
```

2.7.5 Target Slot Number

:DISPlay:EVM[:VIEW]:SLOT <integer>

Target Slot Number

Function

Sets the slot number of the measured signal displayed in the graph.

Command

`:DISPlay:EVM[:VIEW]:SLOT <integer>`

Parameter

<integer>	Target Slot Number
Range	Starting Slot Number to Starting Slot Number + Measurement Interval – 1
Resolution	1
Initial value	0

Example of Use

To set Target Slot Number to 1.

`DISP:EVM:SLOT 1`

:DISPlay:EVM[:VIEW]:SLOT?

Target Slot Number Query

Function

Queries the setting of the slot number of the measured signal displayed in the graph.

Query

`:DISPlay:EVM[:VIEW]:SLOT?`

Response

<integer>

Parameter

<integer>	Target Slot Number
Range	Starting Slot Number to Starting Slot Number + Measurement Interval – 1
Resolution	1

Example of Use

To query the setting of Target Slot Number.

`DISP:EVM:SLOT?`

`> 1`

2.7.6 Scale – EVM

`:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel 5|10|20|50`

Scale – EVM

Function

Sets the reference position (the top scale) in Y axis (vertical) of EVM vs Chip graph and can be used irrespective of the selected type of Trace Mode.

Command

`:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel <mode>`

Parameter

<mode>	Scale
5	0 to 5%
10	0 to 10% (Initial value)
20	0 to 20%
50	0 to 50%

Example of Use

To set Scale in EVM vs Chip graph to 10%.

`DISP:EVM:WIND2:TRAC:Y:RLEV 10`

:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel?

Scale – EVM Query

Function

Queries the reference position (the top scale) in Y axis (vertical) of EVM vs Chip graph and can be used irrespective of the selected type of Trace Mode.

Query

```
:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel?
```

Response

```
<mode>
```

Parameter

<mode>	Scale
5	0 to 5%
10	0 to 10%
20	0 to 20%
50	0 to 50%

Example of Use

To query the setting of Scale in EVM vs Chip graph.

```
DISP:EVM:WIND2:TRAC:Y:RLEV?
```

```
> 10
```

2.7.7 Scale – Magnitude Error

:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel 5|10|20|50

Scale – Magnitude Error

Function

Sets the reference position (bottom and top scales) in Y axis (vertical) of Magnitude Error vs Chip graph and can be used irrespective of the selected type of Trace Mode.

Command

:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel <mode>

Parameter

<mode>	Scale
5	-5 to 5% (Initial value)
10	-10 to 10%
20	-20 to 20%
50	-50 to 50%

Example of Use

To set the Scale of the Magnitude Error vs Chip graph to 10%.

DISP:EVM:WIND3:TRAC:Y:RLEV 10

:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALE]:RLEVel?

Scale – Magnitude Error Query

Function

Queries the reference position (bottom and top scales) in Y axis (vertical) of Magnitude Error vs Chip graph and can be used irrespective of the selected type of Trace Mode.

Query

:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALE]:RLEVel?

Response

<mode>

Parameter

<mode>	Scale
5	-5 to 5%
10	-10 to 10%
20	-20 to 20%
50	-50 to 50%

Example of Use

To query the setting of the Scale in the Magnitude Error vs Chip graph.

```
DISP:EVM:WIND3:TRAC:Y:RLEV?
```

```
> 10
```

2.7.8 Scale – Phase Error

:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel 5|10|20|50

Scale – Phase Error

Function

Sets the reference position (bottom and top scales) in Y axis (vertical) of Phase Error vs Chip graph and can be used irrespective of the selected type of Trace Mode.

Command

:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel <mode>

Parameter

<mode>	Scale
5	-5 to 5 degrees (Initial value)
10	-10 to 10 degrees
20	-20 to 20 degrees
50	-50 to 50 degrees

Example of Use

To set the Scale of the Phase Error vs Chip graph to 10 degrees.

DISP:EVM:WIND4:TRAC:Y:RLEV 10

:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel?

Scale – Phase Error Query

Function

Queries the reference position (bottom and top scales) in Y axis (vertical) of Phase Error vs Chip graph and can be used irrespective of the selected type of Trace Mode.

Query

`:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel?`

Response

`<mode>`

Parameter

<code><mode></code>	Scale
5	-5 to 5 degrees
10	-10 to 10 degrees
20	-20 to 20 degrees
50	-50 to 50 degrees

Example of Use

To query the setting of the Scale of the Phase Error vs Chip graph.

`DISP:EVM:WIND4:TRAC:Y:RLEV?`

`> 10`

2.7.9 Storage Mode

`[[:SENSe]:EVM:AVERage[:STATe] OFF|ON|AMAXimum|0|1|2`

Storage Mode

Function

Sets Storage Mode.

Command

`[[:SENSe]:EVM:AVERage[:STATe] <mode>`

Parameter

<mode>	Storage Mode
OFF 0	Off (Initial value)
ON 1	Average
AMAXimum 2	Average & Max

Example of Use

To set Storage Mode to Average.
`EVM:AVER ON`

Related Command

The following command operates the same parameter.
`[[:SENSe]:RHO:AVERage[:STATe] OFF|ON|AMAXimum|0|1|2`

[:SENSe]:EVM:AVERage[:STATe]?

Storage Mode Query

Function

Queries the setting of Storage Mode.

Query

[:SENSe]:EVM:AVERage[:STATe]?

Response

<mode>

Parameter

<mode>	Storage Mode
0	Off
1	Average
2	Average & Max

Example of Use

To query the setting of Storage Mode.

EVM:AVER?

> 1

Related Command

The following command operates the same parameter.

[:SENSe]:RHO:AVERage[:STATe]?

[:SENSe]:RHO:AVERage[:STATe] OFF|ON|AMAXimum|0|1|2

Storage Mode

Function

Sets Storage Mode.

Refer to [:SENSe]:EVM:AVERage[:STATe] OFF|ON|AMAXimum|0|1|2.

Related Command

The following command operates the same parameter.

[:SENSe]:EVM:AVERage[:STATe] OFF|ON|AMAXimum|0|1|2

[[:SENSe]:RHO:AVERage[:STATe]?

Storage Mode Query

Function

Queries the setting of Storage Mode.

Refer to [[:SENSe]:EVM:AVERage[:STATe]?.

Related Command

The following command operates the same parameter.

[[:SENSe]:EVM:AVERage[:STATe]?

2.7.10 Storage Count**[[:SENSe]:EVM:AVERage:COUNT <integer>**

Storage Count

Function

Sets the averaged count for Modulation measurement.

Command

[[:SENSe]:EVM:AVERage:COUNT <integer>

Parameter

<integer>	Storage Count
Range	2 to 9999
Resolution	1
Initial value	2

Example of Use

To set Storage Count to 10.

EVM:AVER:COUNT 10

Related Command

The following command operates the same parameter.

[[:SENSe]:RHO:AVERage:COUNT <integer>

[:SENSe]:EVM:AVERage:COUNT?

Storage Count Query

Function

Queries the setting of the averaged count for Modulation measurement.

Query

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

Response

`<integer>`

Parameter

<code><integer></code>	Storage Count
Range	2 to 9999
Resolution	1

Example of Use

To query the setting of Storage Count.

`EVM:AVER:COUNT?`

`> 10`

Related Command

The following command operates the same parameter.

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

[:SENSe]:RHO:AVERage:COUNT <integer>

Storage Count

Function

Sets the averaged count for Modulation measurement.

Refer to `[:SENSe] :EVM:AVERage:COUNT <integer>`.

Related Command

The following command operates the same parameter.

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

[:SENSe] :RHO :AVERAge :COUNT ?

Storage Count Query

Function

Queries the setting of the averaged count for Modulation measurement.

Refer to [:SENSe] :EVM :AVERAge :COUNT ? .

Related Command

The following command operates the same parameter.

[:SENSe] :EVM :AVERAge :COUNT ?

2.7.11 Marker – On/Off**:CALCulate :EVM :MARKer [:STATe] OFF | ON | 0 | 1**

Marker – On/Off

Function

Sets Marker on/off when Modulation measurement is selected.

Command

:CALCulate :EVM :MARKer [:STATe] <switch>

Parameter

<switch>	Marker
0 OFF	Off
1 ON	On (Initial value)

Example of Use

To display the marker.

CALC :EVM :MARK 1

:CALCulate:EVM:MARKer[:STATe]?

Marker – On/Off Query

Function

Queries the setting of Marker on/off when Modulation measurement is selected.

Query

:CALCulate:EVM:MARKer[:STATe]?

Response

<switch>

Parameter

<switch>	Marker
0	Off
1	On

Example of Use

To query the setting of the marker.
CALC:EVM:MARK?
> 1

2.7.12 Active Trace

:CALCulate:EVM:MARKer:ACTive CONSTellation|BOTTom

Active Trace

Function

Sets the graph (position) targeted for setting the marker.

Command

:CALCulate:EVM:MARKer:ACTive CONSTellation|BOTTom

Parameter

<switch>	Marker
CONSTellation	The upper Graph window
BOTTom	The lower Graph window (Initial value)

Example of Use

To operate the marker displayed on the Constellation graph.
CALC:EVM:MARK:ACT CONS

:CALCulate:EVM:MARKer:ACTive?

Active Trace Query

Function

Queries the setting of Active Trace.

Query

`:CALCulate:EVM:MARKer:ACTive?`

Response

`<mode>`

Parameter

<code><mode></code>	Active Trace
CONS	The upper Graph window
BOTT	The lower Graph window

Example of Use

To query the setting of Active Trace.

```
CALC:EVM:MARK:ACT?
> CONS
```

2.7.13 Chip Number**:CALCulate:EVM:MARKer:CHIP <integer>**

Chip Number

Function

Sets the marker position of the graph displayed in the upper Graph window or lower Graph window in chip units. The graph targeted for setting can be set by parameter Active Trace.

Command

`:CALCulate:EVM:MARKer:CHIP <integer>`

Parameter

<code><integer></code>	Chip Number
Range	0 to 2559
Resolution	1
Initial value	0

Example of Use

To set the marker position to 10 chips.

```
CALC:EVM:MARK:CHIP 10
```

:CALCulate:EVM:MARKer:CHIP?

Chip Number Query

Function

Queries the setting of the marker position of the graph displayed in the upper Graph window or lower Graph window in chip units. The graph targeted for setting can be set by parameter Active Trace.

Query

```
:CALCulate:EVM:MARKer:CHIP?
```

Response

```
<integer>
```

Parameter

<integer>	Chip Number
Range	0 to 2559
Resolution	1

Example of Use

To query the setting of the marker position.

```
CALC:EVM:MARK:CHIP?
```

```
> 10
```

2.7.14 Marker Value

:CALCulate:EVM:MARKer:X?

Marker X Axis Value – Query

Function

Queries the value of X coordinate in the marker on the Constellation graph, when Constellation is selected for parameter Active Trace.

Query

```
:CALCulate:EVM:MARKer:X?
```

Response

```
<real>
```

Parameter

<real>	X coordinate in the marker position of the Constellation graph.
--------	---

Example of Use

To query X coordinate in the marker position of the Constellation graph.

```
CALC:EVM:MARK:X?
```

```
> 0.1234
```

:CALCulate:EVM:MARKer:Y?

Marker Y Axis Value – Query

Function

Queries the value of Y coordinate in the marker of the graph selected by parameter Active Trace.

Query

```
:CALCulate:EVM:MARKer:Y?
```

Response

```
<real>
```

Parameter

```
<real>
```

Y coordinate in the marker position of the graph.
When Active Trace is Constellation:
Constellation: No unit

When Active Trace is Bottom, and Trace Mode is EVM vs Chip:

EVM: Unit %

When Active Trace is Bottom, and Trace Mode is Mag.Error vs Chip:

Magnitude Error: Unit %

When Active Trace is Bottom, and Trace Mode is Phase Error vs Chip:

Phase Error: Unit degree

Example of Use

To query Y coordinate of the marker position.

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

```
> 0.1234
```

2.8 Code Domain Measurement Function

This section describes device messages for Code Domain measurement function.

Table 2.8-1 lists the commands to execute the Code Domain measurement function and the queries to read out the result.

Table 2.8-1 Device Messages for Executing Code Domain Measurement and Reading Result

Function	Device Message
Configure	:CONFigure:CDPower
Initiate	:INITiate:CDPower
Fetch	:FETCh:CDPower [n] ?
Read	:READ:CDPower [n] ?
Measure	:MEASure:CDPower [n] ?

Tables 2.8-2 and 2.8-3 list the responses to parameter n in Table 2.8-1.

Table 2.8-2 Response to Code Domain Measurement Result

n	Result Mode	Response
1 or omitted	A	Returns the measurement results with comma separated value in the following order: 1. EVM (RMS) [%] 2. EVM (Peak) [%] 3. Magnitude Error [%] 4. Code Power [dB] 5. Mean Power [dBm] 6. Number of detected SF 7. Number of code number for detected SF
	B	Returns the measurement results with comma separated value in the following order: 1. EVM (RMS) [%] 2. EVM (Peak) [%] 3. Magnitude Error [%] 4. -999.0 5. Mean Power [dBm] 6. Code Power [dB] 7. to 44. -999.0
2	A/B	Returns Code Domain Power of 256 I phases and 256 Q phases with comma separated value. Unit: dB 1. Code Domain Power of the 1st I phase 2. Code Domain Power of the 1st Q phase ... 511. Code Domain Power of the 256 th I phase 512. Code Domain Power of the 256 th Q phase
4	A/B	Returns active or inactive state to code numbers for I and Q respectively in comma separated value format. Returns 1 when the code is active, and returns 0 when the code is inactive. 1. The 1st I phase is active. 2. The 1st Q phase is active. ... 511. Active state of the 256 th I phase 512. Active state of the 256 th Q phase

Table 2.8-2 Response to Code Domain Measurement Result (Cont'd)

n	Result Mode	Response
5	A/B	Returns the display data of EVM vs. Symbol graph to the selected code number in comma separated value format. Unit: %
6	A/B	Returns the display data of Magnitude Error vs. Symbol graph to the selected code number in comma separated value format. Unit: %
8	A/B	Returns the display IQ data of Constellation graph to the selected code number in comma separated value format.
9	A/B	Returns the display data of Code Power vs. Symbol graph to the selected code number in comma separated value format. Unit: dB
13	A/B	Returns Code Domain Error of 256 I phases 256 Q phases with comma separated value. Unit: dB 1. Code Domain Error of the 1st I phase 2. Code Domain Error of the 1st Q phase ... 511. Code Domain Error of the 256th I phase 512. Code Domain Error of the 256th Q phase
21	A	Returns Spread Factor of 256 I phases 256 Q phases with comma separated value. 1. Spread Factor of the 1st I phase 2. Spread Factor of the 1st Q phase ... 511. Spread Factor of the 256th I phase 512. Spread Factor of the 256th Q phase
	B	Returns -999.0
22	A	Returns Channelization Code Number of 256 I phases 256 Q phases with comma separated value. 1. Channelization Code Number of the 1st I phase 2. Channelization Code Number of the 1st Q phase ... 511. Channelization Code Number of the 256th I phase 512. Channelization Code Number of the 256th Q phase
	B	Returns -999.0
23	A	Returns modulation method of 256 I phases and 256 Q phases with comma separated value. Returns BPSK or 4PAM when the code is active, and returns NONE when the code is inactive. 1. 1. Modulation method of the 1st I phase, 2. 2. Modulation method of the 1st Q phase ... 511. 511. Modulation method of the 256th I phase 512. 512. Modulation method of the 256th Q phase
	B	Response is returned with the number below. -999.0

Table 2.8-3 lists the commands for setting the parameters for the Code Domain measurement function.

Table 2.8-3 Device Messages for Setting Parameters for Code Domain Measurement

Parameter	Device Message
Starting Slot Number	:CALCulate:CDPower:SWEep:START OFFSet <integer>
	:CALCulate:CDPower:SWEep:START OFFSet?
Measurement Interval	:CALCulate:CDPower:SWEep:INTerval TIME <integer>
	:CALCulate:CDPower:SWEep:INTerval TIME?
Analysis Code - Branch	:CALCulate:CDPower:AXIS[:MS] IPH QPH
	:CALCulate:CDPower:AXIS[:MS]?
I Code Number	:CALCulate:CDPower:CODE:I <integer>
	:CALCulate:CDPower:CODE:I?
Q Code Number	:CALCulate:CDPower:CODE:Q
	:CALCulate:CDPower:CODE:Q?
Trace	:DISPlay:CDPower[:VIEW][:SElect] CONStellation EVM MAGNitude CPOWER
	:DISPlay:CDPower[:VIEW][:SElect]?
Trace - Code Domain	:DISPlay:CDPower[:VIEW]:CDOMain[:SElect] POWER ERROR
	:DISPlay:CDPower[:VIEW]:CDOMain[:SElect]?
Target Slot Number	:DISPlay:CDPower[:VIEW]:SLOT <integer>
	:DISPlay:CDPower[:VIEW]:SLOT?
Scale – EVM	:DISPlay:CDPower[:VIEW]:WINDow2:TRACe:Y[:SCALE]:RLEVel 5 10 20 50
	:DISPlay:CDPower[:VIEW]:WINDow2:TRACe:Y[:SCALE]:RLEVel?
Scale – Magnitude Error	:DISPlay:CDPower[:VIEW]:WINDow3:TRACe:Y[:SCALE]:RLEVel 5 10 20 50
	:DISPlay:CDPower[:VIEW]:WINDow3:TRACe:Y[:SCALE]:RLEVel?
Scale – Code Domain Power	:DISPlay:CDPower[:VIEW]:WINDow5:TRACe:Y[:SCALE]:RLEVel 20 40 60 80
	:DISPlay:CDPower[:VIEW]:WINDow5:TRACe:Y[:SCALE]:RLEVel?
Scale – Code Domain Error	:DISPlay:CDPower[:VIEW]:WINDow6:TRACe:Y[:SCALE]:RLEVel 20 40 60 80
	:DISPlay:CDPower[:VIEW]:WINDow6:TRACe:Y[:SCALE]:RLEVel?
Scale – Code Power	:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALE]:RLEVel 20 40 60 80
	:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALE]:RLEVel?
Scale – Code Power Scale Offset	:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALE]:RLEVel
	:OFFSet 0DIV 1DIV
	:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALE]:RLEVel :OFFSet?

Table 2.8-4 lists the commands/queries for reading out the value of the marker setting/the marker position for Code Domain measurement.

Table 2.8-4 Device Messages for Marker of Code Domain Measurement

Parameter	Device Message
Marker – On/Off	:CALCulate:CDPower:MARKer[:STATe] OFF ON 0 1
	:CALCulate:CDPower:MARKer[:STATe]?
Symbol Number	:CALCulate:CDPower:MARKer:SYMBol <integer>
	:CALCulate:CDPower:MARKer:SYMBol?
Marker X axis Value	:CALCulate:CDPower:MARKer:X?
Marker Y axis Value	:CALCulate:CDPower:MARKer:Y?
Marker Y axis Value - I phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:I?
Marker Y axis Code Power Value - I phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:I:CPOWer?
Marker Y axis Code Error Value - I phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:I:CERRor?
Marker Y axis Code Modulation I phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:I:MODulation?
Marker Y axis Spread Factor Value - I phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:I:SFACTor?
Marker Y axis Channelization Code Value - I phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:I:CCODE?
Marker Y axis Value - Q phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:Q?
Marker Y axis Code Power Value - Q phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:Q:CPOWer?
Marker Y axis Code Error Value - Q phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:Q:CERRor?
Marker Y axis Code Modulation Q phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:Q:MODulation?
Marker Y axis Spread Factor Value - Q phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:Q:SFACTor?
Marker Y axis Channelization code Value - Q phase for CDP and CDE	:CALCulate:CDPower:MARKer:Y:Q:CCODE?

2.8.1 Measure

:CONFigure:CDPower

Code Domain

Function

Selects the Code Domain measurement function and does not execute any measurement.

Command

```
:CONFigure:CDPower
```

Example of Use

To select the Code Domain measurement function.
CONF:CDP

:INITiate:CDPower

Code Domain

Function

Executes Code Domain measurement.

Command

```
:INITiate:CDPower
```

Example of Use

To execute Code Domain measurement.
INIT:CDP

:FETCh:CDPower[n]?

Code Domain Query

Function

Queries the result of Code Domain measurement.

Query

```
:FETCh:CDPower [n] ?
```

Response

Refer to Table 2.8-2.

Example of Use

To query the result of Code Domain measurement.
FETC:CDP?

:READ:CDPower[n]?

Code Domain Query

Function

Queries the result after executing Single measurement of Code Domain measurement by the present setting value.

Query

:READ:CDPower [n] ?

Response

Refer to Table 2.8-2.

Example of Use

To execute Code Domain measurement and query the result.

READ:CDP?

Related Command

Has the same operation as the following command.

:MEASure:CDPower [n] ?

:MEASure:CDPower[n]?

Code Domain Query

Function

Queries the result after executing Single measurement of Code Domain measurement by the present setting value.

Refer to :READ:CDPower [n] ? .

Related Command

Has the same operation as the following command.

:READ:CDPower [n] ?

2.8.2 Starting Slot Number

:CALCulate:CDPower:SWEep:STARt|OFFSet <integer>

Starting Slot Number

Function

Sets the starting slot position for Code Domain Power measurement.

Command

```
:CALCulate:CDPower:STARt|OFFSet <integer>
```

Parameter

<integer>	Starting Slot Number
Range	0 to 14
Resolution	1
Initial value	1

Example of Use

To set the Starting Slot Number to 14.
 CALC:CDP:SWE:STAR 14

:CALCulate:CDPower:SWEep:STARt|OFFSet?

Starting Slot Number Query

Function

Queries the Starting Slot Number.

Query

```
:CALCulate:CDPower:STARt|OFFSet?
```

Response

```
<integer>
```

Parameter

<integer>	Starting Slot Number
Range	0 to 14
Resolution	1

Example of Use

To query the Starting Slot Number.
 CALC:CDP:SWE:STAR?
 > 14

2.8.3 Measurement Interval

:CALCulate:CDPower:SWEep:INTerval|TIME <integer>

Measurement Interval

Function

Sets the continuous measurement interval for Code Domain Power measurement in slot units.

Command

:CALCulate:CDPower:SWEep:INTerval|TIME <integer>

Parameter

<integer>	Measurement Interval
Range	1 to 15 – Starting Slot Number
Resolution	1
Initial value	1

Example of Use

To set the Measurement Interval to 15.
CALC:CDP:SWE:INT 15

:CALCulate:CDPower:SWEep:INTerval|TIME?

Measurement Interval Query

Function

Queries the Measurement Interval.

Query

:CALCulate:CDPower:SWEep:INTerval|TIME?

Response

<integer>

Parameter

<integer>	Measurement Interval
Range	1 to 15 – Starting Slot Number
Resolution	1

Example of Use

To query the Measurement Interval.
CALC:CDP:SWE:INT?
> 15

2.8.4 Branch

:CALCulate:CDPower:AXIS[:MS] IPH|QPH

Branch

Function

Sets I/Q phase targeted for analysis.

Command

```
:CALCulate:CDPower:AXIS[:MS] <mode>
```

Parameter

<mode>	Analysis Code – Branch
IPH	I (Initial value)
QPH	Q

Example of Use

To set I phase to the analysis target.
 CALC:CDP:AXIS IPH

:CALCulate:CDPower:AXIS[:MS]?

Branch – Query

Function

Queries the setting of I/Q phase targeted for analysis.

Query

```
:CALCulate:CDPower:AXIS[:MS]?
```

Response

```
<mode>
```

Parameter

<mode>	Analysis Code – Branch
IPH	I
QPH	Q

Example of Use

To query the setting of Branch.
 CALC:CDP:AXIS?
 > IPH

2.8.5 I Code Number

:CALCulate:CDPower:CODE:I <integer>

I Code Number

Function

Sets the code number of the analysis/display target of I phase.

Command

:CALCulate:CDPower:CODE:I <integer>

Parameter

<integer>	I Code Number
Range	0 to 255
Resolution	1
Initial value	0

Example of Use

To set I Code Number to 16.
CALC:CDP:CODE:I 16

:CALCulate:CDPower:CODE:I?

I Code Number – Query

Function

Queries the setting of the code number of the analysis/display target of I phase.

Command

:CALCulate:CDPower:CODE:I?

Parameter

<integer>	I Code Number
Range	0 to 255
Resolution	1

Example of Use

To query the setting of I Code Number.
CALC:CDP:CODE:I?
> 16

2.8.6 Q Code Number

:CALCulate:CDPower:CODE:Q <integer>

Q Code Number

Function

Sets the code number of the analysis/display target of Q phase.

Command

:CALCulate:CDPower:CODE:Q <integer>

Parameter

<integer>	Q Code Number
Range	0 to 255
Resolution	1
Initial value	0

Example of Use

To set Q Code Number to 16.
CALC:CDP:CODE:Q 16

:CALCulate:CDPower:CODE:Q?

Q Code Number – Query

Function

Queries the setting of the code number of the analysis/display target of Q phase.

Command

:CALCulate:CDPower:CODE:Q?

Parameter

<integer>	Q Code Number
Range	0 to 255
Resolution	1

Example of Use

To query the setting of Q Code Number.
CALC:CDP:CODE:Q?
 > 16

2.8.7 Trace

:DISPlay:CDPower[:VIEW][:SElect]

CONStellation|EVM|MAGNitude|CPOWer

Trace Mode

Function

Sets the type of the graph displayed in the lower Graph window when Code Domain measurement is selected.

Command

:DISPlay:CDPower[:VIEW][:SElect] <mode>

Parameter

<mode>	Trace Mode
CONStellation	Constellation
EVM	EVM vs. Symbol
MAGNitude	Mag. Error vs. Symbol
CPOWer	Code Power vs. Symbol (Initial value)

Example of Use

To set Trace Mode to Code Power vs. Symbol.
DISP:CDP CPOW

:DISPlay:CDPower[:VIEW][:SElect]?

Trace Mode Query

Function

Queries the type of the graph displayed in the lower Graph window when Code Domain measurement is selected.

Query

```
:DISPlay:CDPower[:VIEW][:SElect]?
```

Response

```
<mode>
```

Parameter

<mode>	Trace Mode
CONS	Constellation
EVM	EVM vs. Symbol
MAGN	Mag. Error vs. Symbol
CPOW	Code Power vs. Symbol

Example of Use

To query the setting of Trace Mode.

```
DISP:CDP?
> CPOW
```

2.8.8 Trace - Code Domain**:DISPlay:CDPower[:VIEW]:CDOMain[:SElect] POWER|ERRor**

Trace Mode - Code Domain

Function

Sets the type of the graph displayed in the upper Graph window when Code Domain measurement is selected.

Command

```
:DISPlay:CDPower[:VIEW]:CDOMain[:SElect] <mode>
```

Parameter

<mode>	Trace Mode
POWER	Code Domain Power (Initial value)
ERRor	Code Domain Error

Example of Use

To set Trace Mode to Code Domain Error.

```
DISP:CDP:CDOM ERR
```

:DISPlay:CDPower[:VIEW]:CDOMain[:SElect]?

Trace Mode Query

Function

Queries the type of the graph displayed in the upper Graph window when Code Domain measurement is selected.

Query

```
:DISPlay:CDPower[:VIEW]:CDOMain[:SElect]?
```

Response

```
<mode>
```

Parameter

<mode>	Trace Mode
POW	Code Domain Power
ERR	Code Domain Error

Example of Use

```
To query the setting of Trace Mode.  
DISP:CDP:CDOM?  
> ERR
```

2.8.9 Target Slot Number

:DISPlay:CDPower[:VIEW]:SLOT <integer>

Target Slot Number

Function

Sets the slot number of the measured signal displayed on the graph.

Command

```
:DISPlay:CDPower[:VIEW]:SLOT <integer>
```

Parameter

<integer>	Target Slot Number
Range	Starting Slot Number to Starting Slot Number + Measurement Interval - 1
Resolution	1
Initial value	0

Example of Use

```
To set Target Slot Number to 1.  
DISP:CDP:SLOT 1
```

:DISPlay:CDPower[:VIEW]:SLOT?

Target Slot Number Query

Function

Queries the setting of the slot number of the measured signal displayed on the graph.

Query

```
:DISPlay:CDPower[:VIEW]:SLOT?
```

Response

```
<integer>
```

Parameter

<code><integer></code>	Target Slot Number
Range	Starting Slot Number to Starting Slot Number + Measurement Interval - 1
Resolution	1

Example of Use

To query the setting of Target Slot Number.

```
DISP:CDP:SLOT?
> 1
```

2.8.10 Scale – EVM

:DISPlay:CDPower[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel 5|10|20|50

Scale – EVM

Function

Sets the reference position (top scale) of Y axis (vertical) of EVM vs Symbol graph and can be used irrespective of the type of the selected Trace Mode.

Command

```
:DISPlay:CDPower[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel  
<mode>
```

Parameter

<mode>	Scale
5	0 to 5% (Initial value)
10	0 to 10%
20	0 to 20%
50	0 to 50%

Example of Use

To set the Scale of EVM vs Symbol graph to 10%.
DISP:CDP:WIND2:TRAC:Y:RLEV 10

:DISPlay:CDPower[:VIEW]:WINDow2:TRACe:Y[:SCALE]:RLEVel?

Scale – EVM Query

Function

Queries the reference position (top scale) of Y axis (vertical) of EVM vs Symbol graph and can be used irrespective of the type of the selected Trace Mode.

Query

`:DISPlay:CDPower[:VIEW]:WINDow2:TRACe:Y[:SCALE]:RLEVel?`

Response

<mode>

Parameter

<mode>	Scale
5	0 to 5%
10	0 to 10%
20	0 to 20%
50	0 to 50%

Example of Use

To query the setting of the Scale of EVM vs Symbol graph.
`DISP:CDP:WIND2:TRAC:Y:RLEV?`
 > 10

2.8.11 Scale – Magnitude Error

:DISPlay:CDPower[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel 5|10|20|50

Scale – Magnitude Error

Function

Sets the reference position (bottom and top scales) of Y axis (vertical) of Magnitude Error vs Symbol graph and can be used irrespective of the type of the selected Trace Mode.

Command

```
:DISPlay:CDPower[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel  
<mode>
```

Parameter

<mode>	Scale
5	-5 to 5% (Initial value)
10	-10 to 10%
20	-20 to 20%
50	-50 to 50%

Example of Use

To set the Scale of Magnitude Error vs Symbol graph to 10%.

```
DISP:CDP:WIND3:TRAC:Y:RLEV 10
```

:DISPlay:CDPower[:VIEW]:WINDow3:TRACe:Y[:SCALE]:RLEVel?

Scale – Magnitude Error Query

Function

Queries the reference position (bottom and top scales) of Y axis (vertical) of Magnitude Error vs Symbol graph and can be used irrespective of the type of the selected Trace Mode.

Query

```
:DISPlay:CDPower[:VIEW]:WINDow3:TRACe:Y[:SCALE]:RLEVel?
```

Response

```
<mode>
```

Parameter

<mode>	Scale
5	-5 to 5%
10	-10 to 10%
20	-20 to 20%
50	-50 to 50%

Example of Use

To query the setting of the Scale of Magnitude Error vs Symbol graph.

```
DISP:CDP:WIND3:TRAC:Y:RLEV?
> 10
```

2.8.12 Scale – CDP

:DISPlay:CDPower[:VIEW]:WINDow5:TRACe:Y[:SCALe]:RLEVel 20|40|60|80
Scale – CDP

Function

Sets the scale of Y axis (vertical) of CDP graph. The reference position (top scale) is fixed to 0 dB. This function can be used irrespective of the type of the selected Trace Mode.

Command

```
:DISPlay:CDPower[:VIEW]:WINDow5:TRACe:Y[:SCALe]:RLEVel  
<mode>
```

Parameter

<mode>	Scale
20	-20 to 0 dB
40	-40 to 0 dB
60	-60 to 0 dB
80	-80 to 0 dB (Initial value)

Example of Use

To set the Scale of CDP graph to 60 dB.
DISP:CDP:WIND5:TRAC:Y:RLEV 60

:DISPlay:CDPower[:VIEW]:WINDow5:TRACe:Y[:SCALE]:RLEVel?

Scale – CDP Query

Function

Queries the scale of Y axis (vertical) of CDP graph. The reference position(top scale) is fixed to 0 dB. This function can be used irrespective of the type of the selected Trace Mode.

Query

```
:DISPlay:CDPower[:VIEW]:WINDow5:TRACe:Y[:SCALE]:RLEVel?
```

Response

```
<mode>
```

Parameter

<mode>	Scale
20	-20 to 0 dB
40	-40 to 0 dB
60	-60 to 0 dB
80	-80 to 0 dB

Example of Use

To query the setting of the Scale of CDP graph.

```
DISP:CDP:WIND5:TRAC:Y:RLEV?
```

```
> 60
```

2.8.13 Scale – CDE

:DISPlay:CDPower[:VIEW]:WINDow6:TRACe:Y[:SCALe]:RLEVel 20|40|60|80

Scale – CDE

Function

Sets the scale of Y axis (vertical) of CDE graph. The reference position(bottom scale) is fixed to -80 dB. This function can be used irrespective of the type of the selected Trace Mode.

Command

```
:DISPlay:CDPower[:VIEW]:WINDow6:TRACe:Y[:SCALe]:RLEVel  
<mode>
```

Parameter

<mode>	Scale
20	-80 to -60 dB
40	-80 to -40 dB
60	-80 to -60 dB
80	-80 to 0 dB (Initial value)

Example of Use

To set the Scale of CDE graph to 20 dB.
DISP:CDP:WIND6:TRAC:Y:RLEV 20

:DISPlay:CDPower[:VIEW]:WINDow6:TRACe:Y[:SCALE]:RLEVel?

Scale – CDE Query

Function

Queries the scale of Y axis (vertical) of CDE graph. The reference position(bottom scale) is fixed to -80 dB. This function can be used irrespective of the type of the selected Trace Mode.

Query

```
:DISPlay:CDPower[:VIEW]:WINDow6:TRACe:Y[:SCALE]:RLEVel?
```

Response

```
<mode>
```

Parameter

<mode>	Scale
20	-80 to -60 dB
40	-80 to -40 dB
60	-80 to -60 dB
80	-80 to 0 dB

Example of Use

To query the setting of the Scale of CDE graph.

```
DISP:CDP:WIND6:TRAC:Y:RLEV?
```

```
> 20
```

2.8.14 Scale – Code Power

:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALE]:RLEVel 20|40|60|80

Scale – Code Power

Function

Sets the scale of Y-axis (vertical) of Code Power graph. The reference position (uppermost scale) of the vertical scale depends on Code Power Scale Offset. This function can be used irrespective of the type of the selected Trace Mode.

Command

```
:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALE]:RLEVel  
<mode>
```

Parameter

When Code Power Scale Offset = 0 div:

<mode>	Scale
20	-20 to 0 dB
40	-40 to 0 dB (Initial value)
60	-60 to 0 dB
80	-80 to 0 dB

When Code Power Scale Offset = 1 div:

<mode>	Scale
20	-15 to +5 dB
40	-30 to +10 dB
60	-45 to +15 dB
80	-60 to +20 dB

Example of Use

To set the Scale of Code Power graph to 20 dB.

```
DISP:CDP:WIND7:TRAC:Y:RLEV 20
```


:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALE]:RLEVel?

Scale – Code Power Query

Function

Queries the scale of Y-axis (vertical) of Code Power graph. The reference position (uppermost scale) of the vertical scale depends on Code Power Scale Offset. This function can be used irrespective of the type of the selected Trace Mode.

Query

```
:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALE]:RLEVel?
```

Response

```
<mode>
```

Parameter

When Code Power Scale Offset = 0 div:

<mode>	Scale
20	-20 to 0 dB
40	-40 to 0 dB
60	-60 to 0 dB
80	-80 to 0 dB

When Code Power Scale Offset = 1 div:

<mode>	Scale
20	-15 to +5 dB
40	-30 to +10 dB
60	-45 to +15 dB
80	-60 to +20 dB

Example of Use

To query the setting of the Scale of Code Power graph.

```
DISP:CDP:WIND7:TRAC:Y:RLEV?
```

```
> 20
```

2.8.15 Scale – Code Power Scale Offset

`:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALe]:RLEVel:OFFSet`
`0DIV|1DIV`

Scale – Code Power Scale Offset

Function

This command sets the offset setting of the vertical scale of the Code Power graph.

Command

`:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALe]:RLEVel`
`:OFFSet <mode>`

Parameter

<mode>	Scale range offset
0DIV	0 div (Initial value)
1DIV	1 div

Details

div is a unit of one scale of the graph.

The shift amount (dB) depends on the setting for the vertical scale of the Code Power graph.

The vertical scale ranges for the Code Power graph are as follows.

When Code Power Scale Offset = 0 div:

Setting for vertical scale	Scale range
20	-20 to 0 dB
40	-40 to 0 dB
60	-60 to 0 dB
80	-80 to 0 dB

When Code Power Scale Offset = 1 div:

Setting for vertical scale	Scale range
20	-15 to +5 dB
40	-30 to +10 dB
60	-45 to +15 dB
80	-60 to +20 dB

Example of Use

To set the offset for the vertical scale of the Code Power graph to 1 div.

`DISP:CDP:WIND7:TRAC:Y:RLEV:OFFS 1DIV`

:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALe]:RLEVel:OFFSet?

Scale – Code Power Scale Offset Query

Function

This command queries the offset setting of the vertical scale of the Code Power graph.

Query

```
:DISPlay:CDPower[:VIEW]:WINDow7:TRACe:Y[:SCALe]:RLEVel:OFFSet?
```

Response

```
<mode>
```

Parameter

<mode>	Scale range offset
0DIV	0 div
1DIV	1 div

Details

div is a unit of one scale of the graph.

The shift amount (dB) depends on the setting for the vertical scale of the Code Power graph.

The vertical scale ranges for the Code Power graph are as follows.

When Code Power Scale Offset = 0 div:

Setting for vertical scale	Scale range
20	-20 to 0 dB
40	-40 to 0 dB
60	-60 to 0 dB
80	-80 to 0 dB

When Code Power Scale Offset = 1 div:

Setting for vertical scale	Scale range
20	-15 to +5 dB
40	-30 to +10 dB
60	-45 to +15 dB
80	-60 to +20 dB

Example of Use

To query the offset for the vertical scale of the Code Power graph.

```
DISP:CDP:WIND7:TRAC:Y:RLEV:OFFS?
```

```
> 1DIV
```

2.8.16 Marker – On/Off

:CALCulate:CDPower:MARKer[:STATe] OFF|ON|0|1

Marker – On/Off

Function

Sets whether to enable/disable the marker when Code Domain measurement is selected.

Command

:CALCulate:CDPower:MARKer[:STATe] <switch>

Parameter

<switch>	Marker
0 OFF	Off
1 ON	On (Initial value)

Example of Use

To display the marker.
CALC:CDP:MARK 1

:CALCulate:CDPower:MARKer[:STATe]?

Marker – On/Off Query

Function

Queries the setting of whether to enable/disable the marker when Code Domain measurement is selected.

Query

:CALCulate:CDPower:MARKer[:STATe]?

Response

<switch>

Parameter

<switch>	Marker
0	Off
1	On

Example of Use

To query the setting of the marker.
CALC:CDP:MARK?
> 1

2.8.17 Symbol Number

:CALCulate:CDPower:MARKer:SYMBOL <integer>

Symbol Number

Function

Sets the marker position Constellation/EVM/Magnitude Error/Code Power graph in symbol units.

Command

```
:CALCulate:CDPower:MARKer:SYMBOL <integer>
```

Parameter

<integer>	Symbol Number
Range	0 to 2560/SF-1
Resolution	1
Initial value	0

Example of Use

To set the marker position to the 10th symbol.
CALC:CDP:MARK:SYMB 10

:CALCulate:CDPower:MARKer:SYMBOL?

Symbol Number Query

Function

Queries the marker position of Constellation/EVM/Magnitude Error/Code Power graph in symbol units.

Query

```
:CALCulate:CDPower:MARKer:SYMBOL?
```

Response

```
<integer>
```

Parameter

<integer>	Symbol Number
Range	0 to 2560/SF-1
Resolution	1

Example of Use

To query the setting of the marker position.
CALC:CDP:MARK:SYMB?
> 10

2.8.18 Marker Value

:CALCulate:CDPower:MARKer:X?

Marker X Axis Value – Query

Function

Queries the X coordinate value in the marker displayed on Constellation graph, when Constellation is displayed in the lower Graph window.

Query

:CALCulate:CDPower:MARKer:X?

Response

<real>

Parameter

<real> X coordinate of the marker position on Constellation graph.

Example of Use

To query X coordinate of the marker position on Constellation graph.
CALC:CDP:MARK:X?
> 1.0014

:CALCulate:CDPower:MARKer:Y?

Marker Y Axis Value – Query

Function

Queries the X coordinate value in the marker on the presently displayed graph in the lower Graph window.

Query

```
:CALCulate:CDPower:MARKer:Y?
```

Response

```
<real>
```

Parameter

```
<real>          Y coordinate
                  of the marker position on the graph
Constellation:   No unit
EVM:             Unit %
Magnitude Error: Unit %
Code Power:      Unit dB
```

Example of Use

```
To query Y coordinate of the marker position.
CALC:CDP:MARK:Y?
> 0.9998
```

:CALCulate:CDPower:MARKer:Y:I?

Marker Y axis Value - I phase for CDP and CDE – Query

Function

Queries the Y coordinate value in the marker for I phase of CDP or CDE graph.

Query

:CALCulate:CDPower:MARKer:Y:I?

Response

<real>

Parameter

<real>	Y coordinate of the marker position on the graph
CDP (I):	Unit dB
CDE (I):	Unit dB

Example of Use

To query Y coordinate of the marker position.
CALC:CDP:MARK:Y:I?
> -10.12

:CALCulate:CDPower:MARKer:Y:I:CPOWER?

Marker Y axis Code Power Value - I phase for CDP and CDE – Query

Function

Queries Code Power in the marker for I phase of CDP or CDE graph.

Query

:CALCulate:CDPower:MARKer:Y:I:CPOWER?

Response

<real>

Parameter

<real>	Code Power of the marker position on the graph
CDP (I):	Unit dB

Example of Use

To query Code Power of the marker position.
CALC:CDP:MARK:Y:I:CPOW?
> -10.12

:CALCulate:CDPower:MARKer:Y:I:CERRor?

Marker Y axis Code Error Value - I phase for CDP and CDE – Query

Function

Queries Code Error in the marker for I phase of CDP or CDE graph.

Query

`:CALCulate:CDPower:MARKer:Y:I:CERRor?`

Response

`<real>`

Parameter

<code><real></code>	Code Error of the marker position on the graph Unit dB
CDE (I):	

Example of Use

To query Code Error of the marker position.

```
CALC:CDP:MARK:Y:I:CERR?
> -50.12
```

:CALCulate:CDPower:MARKer:Y:I:MODulation?

Marker Y axis Modulation - I phase for CDP and CDE – Query

Function

This function queries the modulation method for marker to I phase in CDP or CDE graph.

Query

`:CALCulate:CDPower:MARKer:Y:I:MODulation?`

Response

`<mode>`

Parameter

<code><mode></code>	The modulation method for graph marker position
BPSK	BPSK
4PAM	4PAM
NONE	It is not active code.

Example of Use

To query the modulation method for graph marker position

```
CALC:CDP:MARK:Y:I:MOD?
> BPSK
```

:CALCulate:CDPower:MARKer:Y:I:SFACTOR?

Marker Y axis Spread Factor Value - I phase for CDP and CDE – Query

Function

Queries Spread Factor in the marker for I phase of CDP or CDE graph.

Query

:CALCulate:CDPower:MARKer:Y:I:SFACTOR?

Response

<integer>

Parameter

<integer>	Spread Factor of the marker position on the graph
SF (I):	Unit None

Example of Use

To query Spread Factor of the marker position.
CALC:CDP:MARK:Y:I:SFAC?
> 64

:CALCulate:CDPower:MARKer:Y:I:CCODE?

Marker Y axis Channelization Code Value - I phase for CDP and CDE – Query

Function

Queries Channelization Code Number in the marker for I phase of CDP or CDE graph.

Query

:CALCulate:CDPower:MARKer:Y:I:CCODE?

Response

<integer>

Parameter

<integer>	Channelization Code Number of the marker position on the graph
CH (I):	Unit None

Example of Use

To query Channelization Code Number of the marker position.
CALC:CDP:MARK:Y:I:CCOD?
> 16

:CALCulate:CDPower:MARKer:Y:Q?

Marker Y Axis Value – Query

Function

Queries the Y coordinate value in the marker for Q phase of CDP or CDE graph.

Query

```
:CALCulate:CDPower:MARKer:Y:Q?
```

Response

```
<real>
```

Parameter

```
<real>          Y coordinate of the marker position of the graph
                CDP (Q):          Unit dB
                CDE (Q):          Unit dB
```

Example of Use

```
To query Y coordinate of the marker position.
CALC:CDP:MARK:Y:Q?
> -10.12
```

:CALCulate:CDPower:MARKer:Y:Q:CPOWer?

Marker Y axis Code Power Value - Q phase for CDP and CDE – Query

Function

Queries Code Power in the marker for Q phase of CDP or CDE graph.

Query

```
:CALCulate:CDPower:MARKer:Y:Q:CPOWer?
```

Response

```
<real>
```

Parameter

```
<real>          Code Power
                of the marker position of the graph
                CDP (Q):          Unit dB
```

Example of Use

```
To query Code Power of the marker position.
CALC:CDP:MARK:Y:Q:CPOW?
> -10.12
```

:CALCulate:CDPower:MARKer:Y:Q:CERRor?

Marker Y axis Code Error Value - Q phase for CDP and CDE – Query

Function

Queries Code Error in the marker for Q phase of CDP or CDE graph.

Query

:CALCulate:CDPower:MARKer:Y:Q:CERRor?

Response

<real>

Parameter

<real>	Code Error of the marker position of the graph Unit dB
CDE (Q):	

Example of Use

To query Code Error of the marker position.

CALC:CDP:MARK:Y:Q:CERR?

> -40.12

:CALCulate:CDPower:MARKer:Y:Q:MODulation?

Marker Y axis Modulation - Q phase for CDP and CDE – Query

Function

This function queries the modulation method for marker to Q phase in CDP or CDE graph

Query

:CALCulate:CDPower:MARKer:Y:Q:MODulation?

Response

<mode>

Parameter

<mode>	The modulation method for graph marker position.
BPSK	BPSK
4PAM	4PAM
NONE	It is not active code.

Example of Use

To query the modulation method for graph marker position

CALC:CDP:MARK:Y:Q:MOD?

> 4PAM

:CALCulate:CDPower:MARKer:Y:Q:SFACTOR?

Marker Y axis Spread Factor Value - Q phase for CDP and CDE – Query

Function

Queries Spread Factor in the marker for Q phase of CDP or CDE graph.

Query

`:CALCulate:CDPower:MARKer:Y:Q:SFACTOR?`

Response

`<integer>`

Parameter

<code><integer></code>	Spread Factor of the marker position of the graph
SF (Q):	Unit None

Example of Use

To query Spread Factor of the marker position.

`CALC:CDP:MARK:Y:Q:SFAC?``> 4`**:CALCulate:CDPower:MARKer:Y:Q:CCODE?**

Marker Y axis Channelization Code Value - Q phase for CDP and CDE – Query

Function

Queries the Channelization Code Number in the marker for Q phase of CDP or CDE graph.

Query

`:CALCulate:CDPower:MARKer:Y:Q:CCODE?`

Response

`<integer>`

Parameter

<code><integer></code>	Channelization Code Number of the marker position of the graph
CH (Q):	Unit None

Example of Use

To query Channelization Code Number of the marker position.

`CALC:CDP:MARK:Y:Q:CCOD?``> 1`

Chapter 3 *SCPI Status Register*

This chapter describes the SCPI commands and the Status register for querying application statuses.

3.1	Querying Measurement Status	3-2
3.2	STATus:QUESTionable Register.....	3-3
3.3	STATus:OPERation Register	3-13

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.

Example of Use

To query the measurement status.
:STAT:ERR?
> 0

3.2 STATUS:QUESTIONABLE Register

Figure 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.

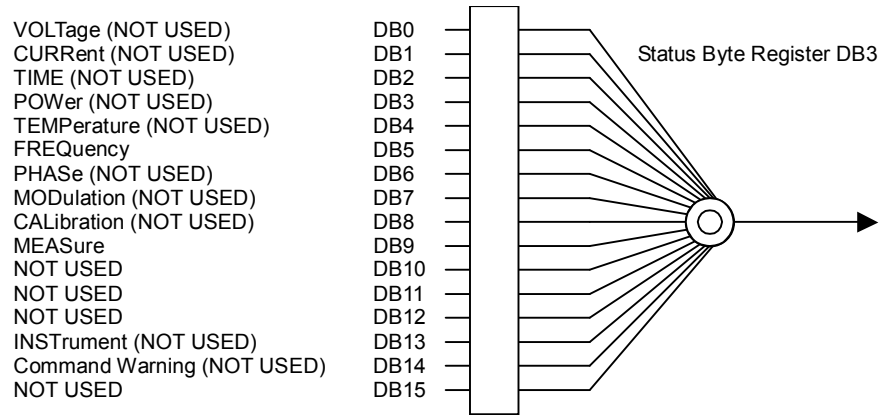


Figure 3.2-1 QUESTIONABLE Status Register

Table 3.2-1 Bit Definition of QUESTIONABLE Status Register

Bit	Definition
DB5	Unlock Reference Clock
DB9	QUESTIONABLE Measure Register Summary

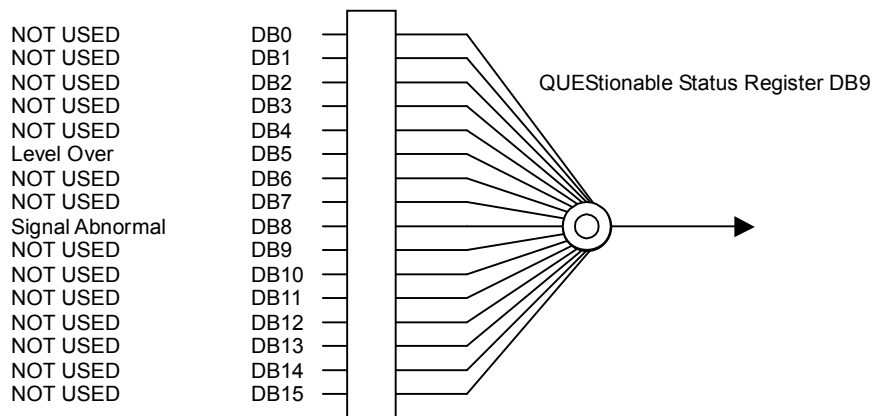


Figure 3.2-2 QUESTIONABLE Measure Register

Table 3.2-2 Bit Definition of QUESTIONABLE Measure Register

Bit	Definition
DB5	Exceeded the level.
DB8	Signal abnormal

Table 3.2-3 lists the device messages for the QUESTIONable Status register.

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

<code><integer></code>	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

<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 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

<integer>	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

<integer>	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

<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 the QUESTIONABLE Measure Register.

```

:STAT: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

<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 QUESTIONABLE Measure register.

```

:STAT:QUES: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

<integer>	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: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

<integer>	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: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: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: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: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:PTR?  
> 16
```

3.3 STATUS:OPERation Register

Figure 3.3-1 and Table 3.3-1 show the layer structure of the OPERATION Status register.

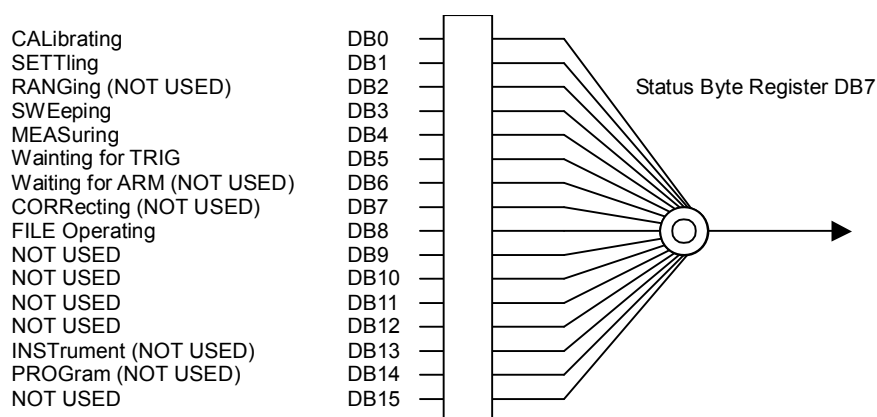


Figure 3.3-1 OPERATION Status Register

Table 3.3-1 Bit Definition of OPERATION Status Register

Bit	Definition
DB0	Executing CAL
DB1	Displaying Warm Up
DB3	Measuring (fixed to 1 in Continuous)
DB5	Waiting for trigger
DB8	Manipulating file

Table 3.3-2 lists the device messages for the OPERATION Status register.

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?

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SCPI Status Register

:STATus:OPERation[:EVENT]?

Operation Status Register Event

Function

Queries the event register of the OPERation Status register.

Query

:STATus:OPERation[: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 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

<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 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

<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 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

<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 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
```

