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 (Main Frame Operation), MS2830A Signal Analyzer Operation Manual (Main Frame Operation) or MS2850A Signal Analyzer Operation Manual (Main Frame Operation) and MX269015A TD-SCDMA Measurement Software Operation Manual (Operation). Please also refer to these documents before using the equipment.

Keep this manual with the equipment.
Safety Symbols

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

Symbols used in manual

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

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

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

Safety Symbols Used on Equipment and in Manual

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

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

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

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

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

- 🔄 These indicate that the marked part should be recycled.

MX269015A
TD-SCDMA Measurement Software
Operation Manual  Remote Control

7 February 2008 (First Edition)
28 April 2017 (Fifth Edition)

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About This Manual

Composition of Operation Manuals

The operation manuals for the MX269015A TD-SCDMA Measurement Software are comprised as shown in the figure below.

- Signal Analyzer Operation Manual (Main Frame Operation)
- Signal Analyzer Operation Manual (Main Frame Remote Control)
  These manuals describe basic operating methods, maintenance procedures, common functions, and common remote control of the signal analyzer Main Frame.
- TD-SCDMA Measurement Software Operation Manual (Operation)
  This manual describes basic operating methods and functions of the MX269015A TD-SCDMA Measurement Software.
- TD-SCDMA Measurement Software Operation Manual (Remote Control)
  This manual describes remote control of the MX269015A TD-SCDMA Measurement Software.
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Chapter 1 Overview

This chapter overviews remote control operation of the MX269015A TD-SCDMA Measurement Software (hereafter, “this application”).

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1.4 Character Programs Available for Setting
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1.1 Overview

This application can be controlled from an external controller (PC) by remote control commands using the MS269x Series, MS2830A or MS2850A Signal Analyzer (hereafter “this instrument”).

Remote control commands for this application are in the SCPI format 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 Remote lamp lights; the lamp is off at local-interface operation.

Refer to the “MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Main Frame 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.
1.2 Basic Control Flow

This part explains the basic remote control command programming for measuring a TD-SCDMA signal.

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).

Fig. 1.2-1  Basic Test Flow

(1) Initialization
The communication interface is initialized and the parameters are initialized at the application start.
Chapter 1 Overview

(2) Basic Parameter Setting
The carrier frequency, input level and all other measurement parameters are set.

1.2.2 Basic Parameter Settings

(3) Common Setting
Common parameters for the executed modulation analysis function are set. These parameters include signal direction, scrambling code number, maximum user, target slot number, carrier number, target carrier, active channel threshold, active slot threshold, auto rate detection and spreading factor.

1.2.3 Common Settings

(4) Modulation Analysis
This application executes modulation analysis. The modulation analysis function is selected first. The trace mode, storage mode, etc., are set next and the measurement results are read.

1.2.4 Modulation Analysis

(5) Power vs Time Measurement
This application executes Power vs Time measurement. The Power vs Time measurement function is selected first. The wide dynamic range, storage mode, etc., are set next and the measurement results are read.

1.2.5 Power vs Time Measurement

(6) ACP/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 OBW Measurement
1.2.8 SEM Measurement
1.2 Basic Control Flow

1.2.1 Initialization

At initialization, this instrument and application are prepared for use. Initialization includes the following steps.

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/MS2840A/MS2850A Signal Analyzer Operation Manual (Main Frame Remote Control)” for details about the remote control interface.

2) Setting Language Mode and Response Format
   The language mode and response format used to communicate are set. Refer to the “MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Main Frame 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.
### Chapter 1 Overview

(6) Setting Measurement Mode

After initialization, the measurement mode is continuous measurement. To select single measurement, switch to the single measurement mode.

#### Initialization Flow and Command Example

<table>
<thead>
<tr>
<th>Start</th>
<th>Initialization of Communication Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Setting of language mode and response mode</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>SYST:LANG SCPI</td>
</tr>
<tr>
<td></td>
<td>SYST:RES:MODE A</td>
</tr>
<tr>
<td></td>
<td>Starting the application</td>
</tr>
<tr>
<td></td>
<td>SYST:APPL:LOAD TDSCDMA</td>
</tr>
<tr>
<td></td>
<td>SYST:APPL:LOAD SIGANA</td>
</tr>
<tr>
<td></td>
<td>SYST:APPL:LOAD SPECT</td>
</tr>
<tr>
<td></td>
<td>Selecting the application</td>
</tr>
<tr>
<td></td>
<td>INST TDSCDMA</td>
</tr>
<tr>
<td></td>
<td>Initialization</td>
</tr>
<tr>
<td></td>
<td>*RST</td>
</tr>
<tr>
<td></td>
<td>*CLS</td>
</tr>
<tr>
<td></td>
<td>Setting measurement mode</td>
</tr>
<tr>
<td></td>
<td>INIT:CONT OFF</td>
</tr>
<tr>
<td>End</td>
<td></td>
</tr>
</tbody>
</table>

![Fig. 1.2.1-1 Initialization Flow and Command Example](image-url)
1.2.2 Basic Parameter Settings

Parameters that are common to all applications such as carrier frequency and input level are set. These parameters are applied to this application, and the signal analyzer and spectrum analyzer applications. The basic parameters include:

1. Frequency
2. Input Level (Reference Level/Attenuator)
3. Level Offset
4. Pre-Amp (Option)
5. Trigger (Gate)

**Fig. 1.2.2-1 Flow of Basic Parameter Setting and Command Example**

- **Setting Frequency**
  - FREQ:MODE MULT
  - FREQ:CENT 2.010GHZ

- **Setting Input Level**
  - POW:RANG:ILEV -10.00DBM

- **Setting Level Offset**
  - DISP:WIND:TRAC:Y:RLEV:OFFS 0.25DB

- **Setting Pre-Amp (Option)**
  - POW:GAIN OFF

- **Setting Trigger**
  - TRIG ON
  - TRIG:SOUR EXT
  - TRIG:SLOP POS
  - TRIG:DEL 0
1.2.3 Common Settings

Common parameters for this application are set. There are no restrictions on the setting order unless otherwise specified.

1. Signal Direction
2. Scrambling Code Number
3. Maximum User
4. Target Slot Number
5. Carrier Number
6. Target Carrier
7. Active Channel Threshold
8. Active Slot Threshold
9. Auto Rate Detection
10. Spreading Factor

Start

Setting Signal Direction
RAD:SDIR DL

Setting Scrambling Code
EVM:SYNC:SCR 0

Setting Maximum User
TDEM:MXUS 16

Setting Target Slot Number
TDEM:SLOT TS0
1.2 Basic Control Flow

**Overview**

1. **Setting Carrier Number**
   - MCP:CARR:COUN 3

2. **Setting Target Carrier**
   - MCP:CARR 3

3. **Setting Active Channel Threshold**
   - TDEM:THR:CHAN -20

4. **Setting Active Slot Threshold**
   - TDEM:THR:SLOT -10

5. **Setting Auto Rate Detection**
   - EVM:SFAC:AUTO OFF

6. **Setting Spreading Factor**
   - EVM:SFAC 16

**End**

*Fig. 1.2.3-1 Flow of Setting Common Parameters and Command Example*
1.2.4 Modulation Analysis

This executes the Modulation analysis function as follows:

1. Selecting measurement function
2. Setting measurement parameters
   This applies only to modulation analysis.
   (a) Averaging
3. Measuring and reading results
4. Setting display contents
   This step is unnecessary when results are read by remote control.
   These remote control commands display results on the screen as at
   manual operation.
   (a) Trace Mode
   (b) Scale
   (c) Marker
1.2 Basic Control Flow

Start

Setting Measurement Function
CONF:EVM

Setting Measurement Parameters
EVM:AVER ON
EVM:AVER:COUN 10

Measuring and Reading Results
READ:EVM?
STAT:ERR?

Setting Display Contents (when necessary)
DISP:EVM CDP
DISP:EVM:WIND:TRAC:Y:RLEV 60
CALC:EVM:MARK:ACT CONS
CALC:EVM:MARK:CHIP 0
CALC:EVM:MARK:X?
CALC:EVM:MARK:Y?
CALC:EVM:MARK:ACT BOTT
CALC:EVM:CDP:MARK:CODE 0
CALC:EVM:CDP:MARK:Y?

End

Fig. 1.2.4-1 Flow of Modulation Measurement and Command Example
1.2.5 Power vs Time Measurement

The Power vs Time measurement is executed in the following order:

(1) Selecting measurement function

(2) Setting measurement parameters
   The following parameters are only applied to Power vs Time measurement:
   (a) Wide Dynamic Range
   (b) Noise Correction
   (c) Pre-Amp Mode
   (d) Select Mask
   (e) Mask Setup
   (f) Smoothing
   (g) Storage

(3) Measuring and reading measurement results

(4) Setting the display content
   This setting is required for displaying measurement 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) Marker
1.2 Basic Control Flow

Overview

Selecting Measurement Function
- CONF:PVT

Setting Measurement Parameters
- PVT:WDR ON
- PVT:NCOR ON
- PVT:PAM OFF
- PVT:MASK:SEL STAN
- PVT:SMO ON
- PVT:SMO:LENG 1.0
- PVT:AVER ON
- PVT:AVER:COUN 20

Measuring and Reading Results
- READ:PVT?

Setting Contents to Be Displayed (as required)
- CALC:PVT:WIND2:MARK:MAX
- *WAI
- CALC:PVT:WIND2:MARK:POW:ABS?

End

Figure 1.2.5-1 Flow of Power vs Time Measurement and Command Example
**Note:**

1. When Wide Dynamic Range is changed to On, Pre-Amp is switched to Off automatically.

2. Noise Correction and Pre-Amp Mode can be set when Wide Dynamic Range is On.

3. Both Noise Correction and Pre-Amp Mode cannot be set to On at the same time.

4. Pre-Amp Mode can be set when Trigger Switch is On.
1.2.6 ACP (Adjacent Channel Power) Measurement

This measures Adjacent Channel Power using the spectrum analyzer or signal analyzer.

1. Selecting application and measurement function
   The application to execute ACP measurement is selected from the signal analyzer or spectrum analyzer. The application changes to the selected application when the ACP measurement function is executed. The values of the basic parameters are passed to the selected application.

2. Setting measurement parameters
   The following are parameters applied only to the specific selected application.
   (a) Trigger Delay (signal analyzer)
       Gate Length and Gate Delay (spectrum analyzer)
   (b) Time Length/Filter Type/Storage (signal analyzer)
       Sweep Time/Filter Type/Storage (spectrum analyzer)

3. Measuring and reading results

![Flowchart](image_url)

Fig. 1.2.6-1 Flow of ACP Measurement using Spectrum Analyzer and Command Example
1.2.7 OBW (Occupied Bandwidth) Measurement

This measures Occupied Bandwidth using the spectrum analyzer or signal analyzer.

(1) Selecting application and measurement function

The application to execute OBW measurement is selected from either the signal analyzer or spectrum analyzer. The application changes to the selected application when the OBW measurement function is executed. The values of the basic parameters are passed to the selected application.

(2) Setting measurement parameters

The following parameters apply only to the specific application selected.

(a) Trigger Delay (signal analyzer)

Gate Length and Gate Delay (spectrum analyzer)

(b) Time Length/Filter Type/Storage (signal analyzer)

Sweep Time/Filter Type/Storage (spectrum analyzer)

(3) Measuring and reading results

Fig. 1.2.7-1  Flow of OBW Measurement using Spectrum Analyzer and Command Example
1.2.8 SEM (Spectrum Emission Mask) Measurement

This measures Spectrum Emission Mask using the spectrum analyzer.

1) Selecting spectrum analyzer application to perform SEM measurement

   The application changes to the spectrum analyzer application when the SEM measurement function is executed. The values of the basic parameters are passed to the spectrum analyzer application.

2) Setting measurement parameters

   The following are parameters applied only to the specific selected application.

   (a) Gate Length and Gate Delay
   (b) Sweep Time/Filter Type/Storage

3) Measuring and reading results

   ![Flowchart of SEM Measurement using Spectrum Analyzer and Command Example](image)

   **Fig. 1.2.8-1** Flow of SEM Measurement using Spectrum Analyzer and Command Example
1.2.9 Switching Between Signal Analyzer and Spectrum Analyzer

The two methods for switching between the signal analyzer and spectrum analyzer by remote control are as follows:

**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>.

Basic parameters such as carrier frequency, and input level (reference level) are reflected at the selected application. Note that the template is set automatically according to the application state. There are no restrictions on control of the selected application.

Moreover, the signal analyzer and spectrum analyzer can be switched using CONFigure:<measure>. In this case, the basic parameters such as the carrier frequency, input level (reference level), template, etc. are reflected.

Changes to basic parameters, such as carrier frequency and input level (reference level), etc., at the signal analyzer or spectrum analyzer are reflected when control is returned to this application using CONFigure:<measure>.

With this method, the program execution time is shorter than method (2) because there is no need to set basic measurement parameters at each measurement function.

(2) Execute INStrument[:SELect] SIGANA | SPECT.

Using this method, neither the parameter nor template is reflected.
Fig. 1.2.9-1  Switching Measurement between Applications
1.3 Using Native Mode

To control this application using the native format, use the following commands to switch to native mode from SCPI format.

The following switching rules apply.

**Switching Rules**

1. A numeric parameter in the program header of the SCPI command is moved to the beginning of the argument and is omitted for commands that only take one kind of value.
2. When two or more nodes can be selected, the first one is used.
3. Omissible hierarchy is omitted.
4. All long-form notations are converted to short form.
5. The first “:“ is omitted.

**Example 1**

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

is switched to native form.

1. A numeric parameter in the program header is moved to the start of the argument.
   ```plaintext
   :CALCulate:MARKer[1]|2[:SET]:CENTer
   ```
   
   ```plaintext
   :CALCulate:MARKer[:SET]:CENTer <integer>
   ```
   (The argument <integer> represents the numeric value 1 or 2.)

2. Omissible hierarchy is omitted.
   ```plaintext
   :CALCulate:MARKer[:SET]:CENTer <integer>
   ```
   ```plaintext
   :CALC:MARK:CENT <integer>
   ```

3. All long-form notations are converted to short form.
   ```plaintext
   :CALCulate:MARKer:CENTer <integer>
   ```
   ```plaintext
   :CALC:MARK:CENT <integer>
   ```

4. The first “:“ is omitted.
   ```plaintext
   :CALC:MARK:CENT <integer>
   ```

5. CALC:MARK:CENT <integer>
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>`
- `<time>`
Chapter 2  SCPI Device Message Details

This chapter details the SCPI remote control commands for executing application functions. Refer to the “MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Main Frame Remote Control)” for details of IEEE488.2 common device messages and application common device messages.

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2.1 Starting and Selecting Application

The device messages for initialization and selection of this application are listed in Table 2.1-1.

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<th>Device Message</th>
</tr>
</thead>
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</tr>
<tr>
<td>Unload Application</td>
<td>:SYSTem:APPLication:UNLoad TDSCDMA</td>
</tr>
<tr>
<td>Application Switch</td>
<td>:INSTrument[:SElect] TDSCDMA</td>
</tr>
<tr>
<td></td>
<td>:INSTrument[:SElect]?</td>
</tr>
<tr>
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<td>:INSTrument:SYSTem TDSCDMA,[ACtive]</td>
</tr>
<tr>
<td></td>
<td>:INSTrument:SYSTem? TDSCDMA</td>
</tr>
<tr>
<td>Initialization</td>
<td>:INSTrument:DEFault</td>
</tr>
<tr>
<td></td>
<td>:SYSTem:PRESet</td>
</tr>
</tbody>
</table>
2.1.1 Starting Application

:SYSTem:APPLication:LOAD TDSCDMA

Load Application

Function

Loads application

Command

:SYSTem:APPLication:LOAD TDSCDMA

Details

This command loads installed application and registers it in application switch menu.

Usage Example

To load application
SYST:APPL:LOAD TDSCDMA

:SYSTem:APPLication:UNLoad TDSCDMA

Unload Application

Function

Unloads application

Command

:SYSTem:APPLication:UNLoad TDSCDMA

Details

This command unloads application and removes from application switch menu.

Usage Example

To unload this application
SYST:APPL:UNL TDSCDMA
2.1.2 Selecting Application

:INSTrument[:SELect] TDSCDMA

Application Switch

Function

Selects controlled application

Command

:INSTrument[:SELect] TDSCDMA

Details

This command switches controlled application.

Usage Example

To switches controlled object to this application
INST TDSCDMA

:INSTrument[:SELect]?

Application Switch Query

Function

Queries current controlled application

Query

:INSTrument[:SELect]?

Response

<apl_name>

Parameter

<apl_name> Application Name
TDSCDMA MX269015A TD-SCDMA Measurement software
SIGANA Signal Analyzer
SPECT Spectrum Analyzer
CONFIG Config

Usage Example

To query controlled application
INST?
> TDSCDMA
Chapter 2  SCPI Device Message Details

:INSTrument:SYStem TDSCDMA,[ACTive]|INACTive|MINimum

Application Status

Function

Sets application window state

Command

:INSTrument:SYStem TDSCDMA,<window>

Parameter

<window>  
ACTive  Operable (window displayed in foreground)  
INACTive  Inoperable  
MINimum  Minimized window  
When omitted  Set to ACTive

Details

This command switches the controlled application.

Usage Example

To sets application window to active

INST:SYST TDSCDMA,ACT
2.1 Starting and Selecting Application

:INSTrument:SYSTem? TDSCDMA

Application Status Query

Function
Queries application window state

Query
:INSTrument:SYSTem? TDSCDMA

Response
<status>,<window>

Parameter

<status>
App  lication State
CURR Application running and current controlled object
RUN Application running but not current controlled object
IDLE Application loaded but not running currently
UNL Application not loaded

<window>
App  lication Window State
ACT Operable (window displayed in foreground)
INAC Inoperable
MIN Minimized window
NON Not displayed

Usage Example
To query the application window state
INST:SYST? TDSCDMA
> CURR,ACT
2.1.3 Initializing

:INSTRument:DEFault
Preset Current Application

Function
Sets application initial settings

Command
:INSTRument:DEFault

Usage Example
To set application initial settings
INST:DEF

Related Command
This related command operates on the same parameter.
:SYSTem:PRESet

:SYSTem:PRESet
Preset Current Application

Function
Sets application initial settings

Command
:SYSTem:PRESet

Usage Example
Sets application initial settings
SYST:PRES

Related Command
This related command operates on the same parameter.
:INSTRument:DEFault
# 2.2 Setting Basic Parameters

This section describes the device messages for parameter settings for frequency, amplitude, and other basic parameters.

## Table 2.2-1 Device Messages for Setting Basic Parameters

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center Frequency</td>
<td>[:SENSe]:FREQuency:CENTer &lt;freq&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:FREQuency:CENTer?</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:FREQuency:MODE CARRier</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:FREQuency:MODE?</td>
</tr>
<tr>
<td>Amplitude</td>
<td>[:SENSe]:POWer[:RF]:RANGE:ILEvel &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:POWer[:RF]:RANGE:ILEvel?</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:POWer[:RF]:RANGE[:UPPer] &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:POWer[:RF]:RANGE[:UPPer]?</td>
</tr>
<tr>
<td>Reference Level</td>
<td>:DISPlay:WINDow[1]:TRACe:Y:[SCAle]:RLEVel &lt;real&gt;</td>
</tr>
<tr>
<td>(Remote only)</td>
<td>:DISPlay:WINDow[1]:TRACe:Y:[SCAle]:RLEVel?</td>
</tr>
<tr>
<td>Level Offset</td>
<td>:DISPlay:WINDow[1]:TRACe:Y:[SCAle]:RLEVel:OFFSet &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:WINDow[1]:TRACe:Y:[SCAle]:RLEVel:OFFSet?</td>
</tr>
<tr>
<td>Level Offset State</td>
<td>:DISPlay:WINDow[1]:TRACe:Y:[SCAle]:RLEVel:OFFSet:STATe ON</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:WINDow[1]:TRACe:Y:[SCAle]:RLEVel:OFFSet:STATe?</td>
</tr>
<tr>
<td>Auto Range</td>
<td>[:SENSe]:POWer[:RF]:RANGE:AUTO ONCE</td>
</tr>
<tr>
<td>Pre-Amp State</td>
<td>[:SENSe]:POWer[:RF]:GAIN[:STATe] ON</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:POWer[:RF]:GAIN[:STATe]?</td>
</tr>
</tbody>
</table>
2.2.1 Frequency
[:SENSe]:FREQuency:CENTer <freq>
Center (Carrier) Frequency for Target Carrier / Center Frequency for Multi Carrier.

Function
Sets center (carrier) frequency of target carrier in carrier frequency mode, or center frequency of multiple carriers in center frequency mode.

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

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;freq&gt;</td>
<td>Carrier/Center Frequency</td>
</tr>
<tr>
<td>Range</td>
<td>100 MHz to the upper limit of the instrument</td>
</tr>
<tr>
<td>Resolution</td>
<td>1 Hz</td>
</tr>
<tr>
<td>Suffix code</td>
<td>HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ</td>
</tr>
<tr>
<td></td>
<td>Without a suffix code, the input value is assumed to be in Hz.</td>
</tr>
<tr>
<td>Initial Value</td>
<td>2.01 GHz</td>
</tr>
</tbody>
</table>

Details
This command differs from panel operation because measurement does not start at command execution.

Usage Example
To set carrier frequency to 2 GHz
FREQ:CENT 2GHZ
2.2 Setting Basic Parameters

[:SENSe]:FREQuency:CENTer?
Carrier/Center Frequency Query

Function
Queries carrier/center frequency

Command
[:SENSe]:FREQuency:CENTer?

Response
<freq>

Parameter
<freq> Carrier/Center Frequency
Range 100 MHz to the upper limit of the instrument
Resolution 1 Hz
The returned value is in Hz.

Usage Example
To query carrier/center frequency
FREQ:CENT?
> 2000000000

[:SENSe]:FREQuency:MODE CARRier|MULt
Frequency Mode

Function
Selects how to set center frequency
Either the center (carrier) frequency of the target carrier (Carrier Frequency Mode), or the center frequency of multiple carriers (Center Frequency Mode) is set.

Command
[:SENSe]:FREQuency:MODE <mode>

Parameter
<mode> Frequency Setting Mode
CARRier Carrier Frequency Mode: Sets center (carrier) frequency of target carrier (default)
MULTi Center Frequency Mode: Sets center frequency of multiple carriers

Usage Example
To set frequency mode to Center Frequency Mode
FREQ:MODE MULT
[:SENSe]:FREQuency:MODE?
Frequency Mode Query

Function
Queries frequency mode setting

Query
[:SENSe]:FREQuency:MODE?

Response
<mode>

Parameter
<mode>  Frequency Mode Setting
CARR  Carrier Frequency Mode: Sets center (carrier) frequency of target carrier (default)
MULT  Center Frequency Mode: Sets center frequency of multiple carriers

Usage Example
To query frequency mode
FREQ:MODE?
> CARR
### 2.2.2 Amplitude

[:SENSe]:POWer[:RF]:RANGe:ILEVel <real>

**Input Level**

Function

Sets RF level of input signal

Command

[:SENSe]:POWer[:RF]:RANGe:ILEVel <real>

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;real&gt;</td>
<td>Input Level</td>
</tr>
<tr>
<td>Range</td>
<td>–60 to +30 dBm</td>
</tr>
<tr>
<td>At Pre-Amp On</td>
<td>–80 to +10 dBm</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Suffix Code</td>
<td>DBM, DM</td>
</tr>
<tr>
<td>Initial Value</td>
<td>–10 dBm</td>
</tr>
<tr>
<td></td>
<td>Without a suffix code, the input value is assumed to be in dBm.</td>
</tr>
</tbody>
</table>

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set input level to –15.00 dBm

POW:RANG:ILEV –15.00DBM

Related Command

This related command operates on the same parameter.

[:SENSe]:POWer[:RF]:RANG:e[:UPPer] <real>
[:SENSe]:POWer[:RF]:RANGe:ILEVel?

Input Level Query

Function

Queries RF level of input signal

Command

[:SENSe]:POWer[:RF]:RANGe:ILEVel?

Parameter

<real> Input Level

Range

−60 to +30 dBm

At Pre-Amp On or Pre-Amp Mode On

−80 to +10 dBm

Resolution 0.01 dB

The returned value is in dBm.

Usage Example

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

Related Command

This related command operates on the same parameter.

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

Input Level

Function
Sets input level

Command
[:SENSe]:POWer[:RF]:RANGe[:UPPer] <real>

Parameter

<real> Input Level
Range −60 to +30 dBm
At Pre·Amp On or Pre·Amp Mode On
−80 to +10 dBm
Resolution 0.01 dB
Suffix Code DBM, DM
Without a suffix code, the input value is assumed to be in dBm.
Initial Value −10 dBm

Details
This command differs from panel operation because measurement does not start at command execution.

Usage Example
To set input level to 0 dBm
POW:RANG 0

Related Command
This related command operates on the same parameter.
[:SENSe]:POWer[:RF]:RANGe:ILEvel <real>
[:SENSe]:POWer[:RF]:RANGe[:UPPer]?

Input Level Query

Function
Queries input level

Query
[:SENSe]:POWer[:RF]:RANGe[:UPPer]?

Response
<real>

Parameter
<real> Input Level
   Range −60 to +30 dBm
   At Pre-Amp On or Pre-Amp Mode On −80 to +10 dBm
   Resolution 0.01 dB

Usage Example
To query input level
POW:RANG?
> 0.00

Related Command
This related command operates on the same parameter.
[:SENSe]:POWer[:RF]:RANGe:ILEVel?
2.2 Setting Basic Parameters

:DISPlay:WINdow[1]:TRACe:Y[:SCAlE]:RLEVel <real>
Reference Level (Peak Power Level)

Function
Sets internal reference level (peak power level)

Command
:DISPlay:WINdow[1]:TRACe:Y[:SCAlE]:RLEVel <real>

Parameter

<table>
<thead>
<tr>
<th>&lt;real&gt;</th>
<th>Input Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>−43 to +47 dBm</td>
</tr>
<tr>
<td>At Pre·Amp On or Pre·Amp Mode On</td>
<td>−63 to +27 dBm</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Suffix Code</td>
<td>DBM, DM</td>
</tr>
</tbody>
</table>

Without a suffix code, the input value is assumed to be in dBm.

Initial value 7 dBm

Details
Reference Level indicates the peak level of the input signal using the internal parameter not displayed on the screen calculated automatically for Input Level.

When the SEM, OBW and ACP measurement functions are called, the value of this Reference Level is applied to these measurement functions. When the value of the Input Level is changed, the Reference Level is also changed.

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set internal reference level to 0 dBm
DISP:WINd:TRAC:y:RLEV 0
Chapter 2  SCPI Device Message Details

:DISP:WINDow[1]:TRACe:Y[:SCALe]:RLEVel?
Reference Level (Peak Power Level) Query

Function
Queries internal reference level (peak power level)

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

Response
<real>

Parameter
<real>  Internal Reference Level
Range  −43 to +47 dBm
At Pre-Amp On or Pre-Amp Mode On
−63 to +27 dBm
Resolution  0.01 dB

Usage Example
To query internal reference level
DISP:WIND:TRAC:Y:RLEV?
> 0.00

:DISP:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <real>
Level Offset Value

Function
Sets level offset value

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

Parameter
<real>  Level Offset Value
Range  −99.99 to +99.99 dB
Resolution  0.01 dB
Suffix Code  DB
Without a suffix code, the input value is assumed to be in dB.
Initial Value  0 dB

Usage Example
To set level offset to 10 dB
DISP:WIND:TRAC:Y:RLEV:OFFS 10
2.2 Setting Basic Parameters

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

Level Offset Value Query

Function
Queries level offset value

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

Response
<real>

Parameter
<real>

Level Offset Value
Range
−99.99 to +99.99 dB
Resolution 0.01 dB
The returned value is in dB.

Usage Example
To query level offset
DISP:WIND:TRAC:Y:RLEV:OFFS?
> 10.00

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

Level Offset Mode

Function
Sets level offset function ON or OFF

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

Parameter
<switch>

Level Offset Function
ON|1 Sets level offset function to ON
OFF|0 Sets level offset function to OFF (default)

Usage Example
To set level offset function to ON
DISP:WIND:TRAC:Y:RLEV:OFFS:STAT ON
**Chapter 2   SCPI Device Message Details**

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

**Level Offset Mode Query**

**Function**
Queries whether level offset function ON or OFF

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

**Response**
<switch>

**Parameter**

<switch> Level Offset Function

1 Level offset function ON

0 Level offset function OFF

**Usage Example**
To query level offset function


> 1

[:SENSe]:POWer[:RF]:RANGe:AUTO ONCE

**Auto Range**

**Function**
This command adjusts input level according to input signal.

**Command**
[:SENSe]:POWer[:RF]:RANGe:AUTO ONCE

**Details**
This command is not available when the Replay function is executed.

**Usage Example**
To auto-adjust the level.

POW:RANG:AUTO ONCE
2.2 Setting Basic Parameters

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

Pre-Amp

Function

Sets Pre-Amp function ON or OFF

Command

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

Parameter

<switch> Pre-Amp Function
ON|1 Pre-Amp ON
OFF|0 Pre-Amp OFF (default)

Details

When the Pre-Amp option (Option-008) is not installed, Pre-Amp is always set to OFF and this command is disabled. This cannot be set when Wide Dynamic Range is On.

Usage Example

To set Pre-Amp to ON
POW:GAIN ON
[:SENSe]:POWer[:RF]:GAIN[:STATe]?

Pre-Amp Query

Function
Queries Pre-Amp function ON or OFF

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

Response
<switch>

Parameter
<switch> Pre-Amp Function
1 Pre-Amp ON
0 Pre-Amp OFF

Details
When the Pre-Amp option (Option-008) is not installed, Pre-Amp is always set to OFF and this command is disabled.

Usage Example
To query the state of Pre-Amp function
POW:GAIN?
> 1
2.3 Common Settings

Table 2.3-1 lists the device messages for setting common parameters. These parameters are applied to modulation and code domain analysis.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Direction</td>
<td>[:SENSe]:RADio:SDIRection UL</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:SDIRection?</td>
</tr>
<tr>
<td>Scrambling Code</td>
<td>[:SENSe]:EVM:SYNC:SCRamble &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:SYNC:SCRamble?</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:TDEMod:SCODe &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:TDEMod:SCODe?</td>
</tr>
<tr>
<td>Maximum Users</td>
<td>[:SENSe]:TDEMod:MXUSer[:BURst]</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:TDEMod:MXUSer[:BURst]</td>
</tr>
<tr>
<td>Target Slot Number</td>
<td>[:SENSe]:TDEMod:SLOT TS0</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:TDEMod:SLOT?</td>
</tr>
<tr>
<td>Carrier Number</td>
<td>[:SENSe]:MCPower:CARRier:COUNt &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:MCPower:CARRier:COUNt?</td>
</tr>
<tr>
<td>Target Carrier</td>
<td>[:SENSe]:MCPower:CARRier &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:MCPower:CARRier?</td>
</tr>
<tr>
<td>Active Channel Threshold</td>
<td>:CALCulate:EVM:ASET:THReshold &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:EVM:ASET:THReshold?</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:TDEMod:THReshold:CHANnel &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:TDEMod:THReshold:CHANnel?</td>
</tr>
<tr>
<td>Active Slot Threshold</td>
<td>[:SENSe]:TDEMod:THReshold:SLOT &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:TDEMod:THReshold:SLOT?</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:SYNC:BURSt:STHReshold &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:SYNC:BURSt:STHReshold?</td>
</tr>
<tr>
<td>Auto Rate Detection</td>
<td>[:SENSe]:EVM:SFACtor:AUTO ON</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:SFACtor:AUTO?</td>
</tr>
<tr>
<td>Spreading Factor</td>
<td>[:SENSe]:EVM:SFACtor &lt;factor&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:SFACtor?</td>
</tr>
</tbody>
</table>
2.3.1 Signal Direction

[:SENSe]:RADio:SDIRection UL|DL

Signal Direction

Function

Sets measured signal direction

Command

[:SENSe]:RADio:SDIRection UL|DL

Parameter

<switch>  Signal Direction
UL  Uplink
DL  Downlink (default)

Details

This command differs from panel operation because measurement does not start at command execution.
This cannot be set when Power vs Time is set.

Usage Example

To set signal direction to Uplink
RAD:SDIR UL

[:SENSe]:RADio:SDIRection?

Signal Direction Query

Function

Queries signal direction

Query

[:SENSe]:RADio:SDIRection?

Response

<switch>

Parameter

<switch>  Signal Direction
UL  Uplink
DL  Downlink (default)

Usage Example

To query signal direction
RAD:SDIR?
> UL
2.3.2 Scrambling Code

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

Scrambling Code

Function

Sets scrambling code number

Command

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

Parameter

<integer> Scrambling Code Number

<table>
<thead>
<tr>
<th>Range</th>
<th>0 to 127</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1</td>
</tr>
<tr>
<td>Initial Value</td>
<td>0</td>
</tr>
</tbody>
</table>

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set scrambling code number to 0

EVM:SYNC:SCR 0

Related Command

This related command operates on the same parameter.

[:SENSe]TDEMod:SCODe <integer>
[:SENSe]:EVM:SYNC:SCRamble?
Scrambling Code Query

Function
Queries scrambling code number

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

Response
<integer>

Parameter
<integer> Scrambling Code Number
Range 0 to 127
Resolution 1

Usage Example
To query scrambling code number
EVM:SYNC:SCR?
> 0

Related Command
This related command operates on the same parameter.
[:SENSe]TDEMod:SCODe?
[:SENSe]:TDEMod:SCODe <integer>
Scrambling Code Number

Function
Sets scrambling code number

Command
[:SENSe]:TDEMod:SCODe <integer>

Parameter
<integer> Scrambling Code Number
Range: 0 to 127
Resolution: 1
Initial Value: 0

Details
This command differs from panel operation because measurement does not start at command execution.

Usage Example
To set scrambling code number to 0
TDEM:SCOD 0

Related Command
This related command operates on the same parameter.
[:SENSe]:EVM:SYNC:SCRamble <integer>
[:SENSe]:TDEMod:SCODe?
Scrambling Code Number Query

Function
Queries scrambling code number

Query
[:SENSe]:TDEMod:SCODe?

Response
<integer>

Parameter
<integer>  Scrambling Code Number
Range  0 to 127
Resolution  1

Usage Example
To query scrambling code number
TDEM:SCOD?
> 0

Related Command
This related command operates on the same parameter.
[:SENSe]:EVM:SYNC:SCRamble?
### 2.3.3 Maximum Users

[:SENSe]:TDEM:MXUSer[:BURSt][:TS[0]|1|2|3|4|5|6] <integer>

**K (Max User)**

**Function**

Sets value of K (Max user)

**Command**

[:SENSe]TDEM:MXUSer[:BURSt]|:TS[0]|1|2|3|4|5|6 <integer>

**Parameter**

<integer> K

- **Range**: 2 to 16 (even integer)
- **Resolution**: 2

**Details**

The value of K (Max Users) is common to all time slots.

This command differs from panel operation because measurement does not start at command execution.

**Usage Example**

To set K (Max Users) to 2

TDEM:MXUS 2
K (Max User) Query

Function

Queries value of K (Max Users)

Query

[:SENSe]:TDEMod:MXUSer[:BURSt]:TS[0]|1|2|3|4|5|6|?

Response

<integer>

Parameter

<integer> K

Range  2 to 16 (even integer)

Resolution  2

Details

The value of K (Max Users) is common to all time slots.

Usage Example

To query value of K

TDEM:MXUS?

> 2
2.3.4 Target Time Slot

[:SENSe]:TDEMod:SLOT TS0|TS1|TS2|TS3|TS4|TS5|TS6|BURSt

Target Time Slot

Function

Sets target time slot

Command

[:SENSe]:TDEMod:SLOT <target>

Parameter

<table>
<thead>
<tr>
<th>&lt;target&gt;</th>
<th>Target Time Slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS0</td>
<td>Time Slot 0</td>
</tr>
<tr>
<td>TS1</td>
<td>Time Slot 1</td>
</tr>
<tr>
<td>TS2</td>
<td>Time Slot 2</td>
</tr>
<tr>
<td>TS3</td>
<td>Time Slot 3</td>
</tr>
<tr>
<td>TS4</td>
<td>Time Slot 4</td>
</tr>
<tr>
<td>TS5</td>
<td>Time Slot 5</td>
</tr>
<tr>
<td>TS6</td>
<td>Time Slot 6</td>
</tr>
<tr>
<td>BURSt</td>
<td>TD-SCDMA Burst</td>
</tr>
</tbody>
</table>

Details

This cannot be set when Power vs Time is set.

Usage Example

To set target time slot to Time Slot 0

TDEM:SLOT TS0
[:SENSe]:TDEMod:SLOT?
Target Time Slot Query

Function
Queries target time slot

Query
[:SENSe]:TDEMod:SLOT?

Response
<target>

Parameter
<target> Target Time Slot
TS0 Time Slot 0
TS1 Time Slot 1
TS2 Time Slot 2
TS3 Time Slot 3
TS4 Time Slot 4
TS5 Time Slot 5
TS6 Time Slot 6
BURS TD-SCDMA Burst

Usage Example
To query target time slot
TDEM:SLOT?
> TS0
2.3.5 Carrier Number

 [:SENSe]:MCPower:CARRier:COUNt <integer>

Carrier Number

Function

Sets number of carriers at multiple-carrier measurement

Command

 [:SENSe]:MCPower:CARRier:COUNt <integer>

Parameter

<integer> Number of Carriers
Range 1 to 6
Resolution 1

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set the number of carriers to 3
MCP:CARR:COUN 3

[:SENSe]:MCPower:CARRier:COUNt?

Carrier Number Query

Function

Queries number of carriers in multi-carrier measurement

Query

 [:SENSe]:MCPower:CARRier:COUNt?

Response

<integer>

Parameter

<integer> Number of Carriers
Range 1 to 6
Resolution 1

Usage Example

To query the number of carriers
MCP:CARR:COUN?
> 3
2.3.6 Target Carrier

[:SENSe]:MCPower:CARRier <target>

Target Carrier

Function

Sets target carrier for modulation analysis

Command

[:SENSe]:MCPower:CARRier <target>

Parameter

<table>
<thead>
<tr>
<th>&lt;target&gt;</th>
<th>Target Carrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carrier 1</td>
</tr>
<tr>
<td>2</td>
<td>Carrier 2</td>
</tr>
<tr>
<td>3</td>
<td>Carrier 3</td>
</tr>
<tr>
<td>4</td>
<td>Carrier 4</td>
</tr>
<tr>
<td>5</td>
<td>Carrier 5</td>
</tr>
<tr>
<td>6</td>
<td>Carrier 6</td>
</tr>
</tbody>
</table>

Details

The target carrier setting range depends on the set number of carriers (Carrier Number).

Usage Example

To set target carrier to Carrier 3

MCP:CARR 3
[:SENSe]:MCPower:CARRier?
Target Carrier Query

Functions

Queries target carrier

Query

[:SENSe]:MCPower:CARRier?

Response

<target>

Parameter

<target>  Target Carrier
1          Carrier 1
2          Carrier 2
3          Carrier 3
4          Carrier 4
5          Carrier 5
6          Carrier 6

Usage Example

To query target carrier
MCP:CARR?
> 3
2.3.7 Active Channel Threshold

:CALCulate:EVM:ASET:THReshold <real>

Active Code Threshold

Function

Sets active channel threshold value

Command

:CALCulate:EVM:ASET:THReshold <real>

Parameter

<real> Threshold
Range −50.0 to −5.0 dB
Resolution 0.1 dB
Initial Value −30.0 dB
Suffix Code DB

Without a suffix code, the input value is assumed to be in dB units.

Details

This is different from panel operation because measurement does not start at command execution.

Usage Example

To set active channel threshold to −20.0 dB
CALC:EVM:ASET:THR −20

Related Command

This related command operates on the same parameter.
[:SENSe]:TDEMod:THReshold:CHANnel <real>
:CALCulate:EVM:ASET:THReshold?

Active Code Threshold Query

Function
Queries active channel threshold value

Query
:CALCulate:EVM:ASET:THReshold?

Response
<real>

Parameter
<real> Threshold
Range −50.0 to −5.0 dB
Resolution 0.1 dB
Initial Value −30.0 dB
Suffix Code DB
Without a suffix code, the input value is assumed to be in dB units.

Usage Example
To query active channel threshold value
CALC:EVM:ASET:THR?

Related Command
This related command operates on the same parameter.
[:SENSe]:TDEMod:THReshold:CHANnel?
[:SENSe]:TDEMod:THReshold:CHANnel <real>
Threshold Level for Code Channel

**Function**
Sets active channel threshold value

**Command**
[:SENSe]:TDEMod:THReshold:CHANnel <real>

**Parameter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;real&gt;</td>
<td>Threshold</td>
</tr>
<tr>
<td>Range</td>
<td>-50.0 to -5.0 dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 dB</td>
</tr>
<tr>
<td>Initial Value</td>
<td>-30.0 dB</td>
</tr>
<tr>
<td>Suffix Code</td>
<td>DB</td>
</tr>
</tbody>
</table>

Without a suffix code, the input value is assumed to be in dB units.

**Details**
This is different from panel operation because measurement does not start at command execution.

**Usage Example**
To set channel threshold to -10.0 dB
TDEM:THR:CHAN -10.0

**Related Command**
This related command operates on the same parameter.
:CALCulate:EVM:ASET:THReshold <real>
## [:SENSe]:TDEMod:THReshold:CHANnel?

**Threshold Level for Code Channel Query**

**Function**
Queries active channel threshold value

**Query**
[:SENSe]:TDEMod:THReshold:CHANnel?

**Response**
<real>

**Parameter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold</td>
<td>−50.0 to −5.0 dB</td>
</tr>
<tr>
<td>Range</td>
<td>0.1 dB</td>
</tr>
<tr>
<td>Initial Value</td>
<td>−30.0 dB</td>
</tr>
<tr>
<td>Suffix Code</td>
<td>DB</td>
</tr>
</tbody>
</table>

Without a suffix code, the input value is assumed to be in dB units.

**Usage Example**
To query active channel threshold value

```
TDEM:THR:CHAN?
> -10.0
```

**Related Command**
This related command operates on the same parameter.

:CALCulate:EVM:ASET:THReshold?
2.3.8 Active Slot Threshold

[:SENSe]:TDEMod:THReshold:SLOT <real>

Threshold Level for Time Slot

Function

Sets active slot threshold level of time slot burst

Command

[:SENSe]:TDEMod:THReshold:SLOT <real>

Parameter

<real> Threshold
  Range −50.0 to −10.0 dB
  Resolution 0.1 dB
  Initial Value −10 dB
  Suffix Code DB

Without a suffix code, the input value is assumed to be in dB units.

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set active slot threshold to −10.0 dB
TDEM:THR:SLOT −10.0

Related Command

This related command operates on the same parameter.
[:SENSe]:SYNC:BURSt:STHReshold <real>
[:SENSe]:TDEMod:THReshold:SLOT?
Threshold Level for Time Slot Query

Function
Queries active slot threshold level of time slot Burst

Query
[:SENSe]:TDEMod:THReshold:SLOT?

Response
<real>

Parameter
<real> Threshold
Range −50.0 to −10.0 dB
Resolution 0.1 dB
Initial Value −10 dB
Suffix Code DB
Without a suffix code, the input value is assumed to be in dB units.

Usage Example
To query active slot threshold level of time slot Burst
TDEM:THR:SLOT?
> −10.0

Related Command
This related command operates on the same parameter
[:SENSe]:SYNC:BURSt:STHReshold?
[:SENSe]:SYNC:BURSt:STHReshold <real>

Threshold Level for Time Slot

Function

Sets active slot threshold level of time slot burst

Command

[:SENSe]:SYNC:BURSt:STHReshold <real>

Parameter

<real> Threshold

Range  -50.0 to −10.0 dB
Resolution  0.1 dB
Initial Value  −10 dB
Suffix Code  DB

Without a suffix code, the input value is assumed to be in dB units.

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set active slot threshold to −10.0 dB
SYNC:BURS:STHR −10.0

Related Command

This related command operates on the same parameter.
[:SENSe]:TDEMod:THReshold:SLOT <real>
[:SENSe]:SYNC:BURSt:STHReshold?
Threshold Level for Time Slot

Function
Queries active slot threshold level of time slot burst

Query
[:SENSe]:SYNC:BURSt:STHReshold?

Response
<real>

Parameter
<real> Threshold
  Range  −50.0 to −10.0 dB
  Resolution  0.1 dB
  Initial Value  −10 dB
  Suffix Code  DB
  Without a suffix code, the input value is assumed to be in dB units.

Usage Example
To query active slot threshold level of time slot burst
SYNC:BURS:STHR?
> −10.0

Related Command
This related command operates on the same parameter.
[:SENSe]:TDEMod:THReshold:SLOT?
2.3.9 Auto Rate Detection
[:SENSe]:EVM:SFACTOR:AUTO ON|OFF|1|0
Auto Spreading Factor

Function
Sets auto spreading factor detection mode to ON or OFF

Command
[:SENSe]:EVM:SFACTOR:AUTO <switch>

Parameter
<switch> Auto Spreading Factor Detection
ON|1 Auto Spreading Factor Detection ON
    (default)
OFF|0 Auto Spreading Factor Detection OFF

Details
This command differs from panel operation because measurement does not start at command execution.

Usage Example
To set auto spreading factor detection to ON
EVM:SFACTOR:AUTO ON
[:SENSe]:EVM:SFACtor:AUTO?
Auto Spreading Factor Query

Function
Queries auto spreading factor detection mode

Query
[:SENSe]:EVM:SFACtor:AUTO?

Response
<switch>

Parameter
<switch> Auto Spreading Factor Detection
1 Auto Spreading Factor Detection ON
(default)
0 Auto Spreading Factor Detection OFF

Usage Example
To query auto spreading factor detection mode
EVM:SFAC:AUTO?
> ON
2.3.10 Spreading Factor

[:SENSe]:EVM:SFACtor <factor>

Spreading Factor

Function

Sets spreading factor

Command

[:SENSe]:EVM:SFACtor <factor>

Parameter

<factor> Spreading Factor

Range 1, 2, 4, 8, 16

Display

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set spreading factor to 16
EVM:SFAC 16

[:SENSe]:EVM:SFACtor?

Spreading Factor Query

Function

Queries spreading factor

Query

[:SENSe]:EVM:SFACtor?

Response

<factor>

Parameter

<factor> Spreading Factor

Range 1, 2, 4, 8, 16

Usage Example

To query spreading factor
EVM:SFAC?
> 16
2.4 Utility Functions

Table 2.4-1 lists device messages for settings of utility functions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delete Warm Up Message</td>
<td>:DISPlay:ANNotation:WUP:ERASe</td>
</tr>
<tr>
<td>Display Title</td>
<td>:DISPlay:ANNotation:TITLe[:STATe] ON</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:ANNotation:TITLe[:STATe]?</td>
</tr>
<tr>
<td>Title Entry</td>
<td>:DISPlay:ANNotation:TITLe:DATA &lt;string&gt;</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:ANNotation:TITLe:DATA?</td>
</tr>
</tbody>
</table>

2.4.1 Delete Warm Up Message

:DISPlay:ANNotation:WUP:ERASe
Delete Warm Up Message

Function

   Deletes warm up message at start

Command

   :DISPlay:ANNotation:WUP:ERASe

Usage Example

   To delete warm up message
   DISP:ANN:WUP:ERAS
2.4.2 Display Title

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

Display Title

Function
Sets title display state to On or Off

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

Parameter

<table>
<thead>
<tr>
<th>&lt;switch&gt;</th>
<th>Title Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>1</td>
</tr>
<tr>
<td>OFF</td>
<td>0</td>
</tr>
</tbody>
</table>

Usage Example

To display title:
DISP:ANN:TITL ON

:DISPlay:ANNotation:TITLe[:STATe]?

Display Title Query

Function
Queries state for title display

Query
:DISPlay:ANNotation:TITLe[:STATe]?

Response

<switch>

Parameter

<table>
<thead>
<tr>
<th>&lt;switch&gt;</th>
<th>Title Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>1</td>
</tr>
<tr>
<td>OFF</td>
<td>0</td>
</tr>
</tbody>
</table>

Usage Example

To query state for title display
DISP:ANN:TITL?
> 1
2.4 Utility Functions

2.4.3 Title Entry

:DISPlay:ANNotation:TITLE:DATA <string>

Title Entry

Function

Sets title character string

Command

:DISPlay:ANNotation:TITLE:DATA <string>

Parameter

<string> The title character string may be up to 32 characters and enclosed in single ('') or double ("") quotation marks.

Usage Example

To set title character string
DISP:ANN:TITL:DATA ‘TEST’

:DISPlay:ANNotation:TITLE:DATA?

Title Entry Query

Function

Queries title character string

Query

:DISPlay:ANNotation:TITLE:DATA?

Response

<string>

Usage Example

To query title character string
DISP:ANN:TITL:DATA?
> TEST
2.5 Common Measurement Functions

Table 2.5-1 lists the message devices for executing and setting parameters for common measurement functions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Measurement</td>
<td>:INITiate:CONTinuous OFF</td>
</tr>
<tr>
<td></td>
<td>:INITiate:CONTinuous?</td>
</tr>
<tr>
<td></td>
<td>:INITiate:MODE:CONTinuous</td>
</tr>
<tr>
<td>Single Measurement</td>
<td>:INITiate:MODE:SINGLE</td>
</tr>
<tr>
<td>Initiate</td>
<td>:INITiate[:IMMediate]</td>
</tr>
<tr>
<td>Configure</td>
<td>:CONFigure?</td>
</tr>
<tr>
<td>Trigger State</td>
<td>:TRIGger[:SEQUence][:STATe] OFF</td>
</tr>
<tr>
<td></td>
<td>:TRIGger[:SEQUence][:STATe]?</td>
</tr>
<tr>
<td>Trigger Source</td>
<td>:TRIGger[:SEQUence]:SOURce EXTernal[1</td>
</tr>
<tr>
<td></td>
<td>:TRIGger[:SEQUence]:SOURce?</td>
</tr>
<tr>
<td></td>
<td>:TRIGger:EVM:SOURce EXTernal[1</td>
</tr>
<tr>
<td></td>
<td>:TRIGger:EVM:SOURce?</td>
</tr>
<tr>
<td>Trigger Slope</td>
<td>:TRIGger[:SEQUence]:SLOPe POSitive</td>
</tr>
<tr>
<td></td>
<td>:TRIGger[:SEQUence]:SLOPe?</td>
</tr>
<tr>
<td>Trigger Delay</td>
<td>:TRIGger[:SEQUence]:DELay &lt;time&gt;</td>
</tr>
<tr>
<td></td>
<td>:TRIGger[:SEQUence]:DELay?</td>
</tr>
</tbody>
</table>

Note:
The trigger settings are common to all measurement functions of this application.

Also, when a trigger is set using the signal analyzer, this setting applies to the signal analyzer measurement functions. The same condition applies to the spectrum analyzer.

However, to avoid application of trigger settings not intended for a particular function, set the trigger for each measurement function, which hardly delays processing time.
2.5 Common Measurement Functions

2.5.1 Measurement and Control

:INITiate:CONTinuous OFF|ON|0|1

Continuous Measurement

Function

Switches measurement mode between Single and Continuous

Command

:INITiate:CONTinuous <switch>

Parameter

<switch> Measurement Mode
0|OFF Single Measurement
1|ON Continuous Measurement (default)

Details

When the measurement mode is On, the Continuous Measurement starts. On the other hand, when the measurement mode is Off, the measurement does not start due to the single measurement mode selected.

Usage Example

To set mode to Continuous Measurement

INIT:CONT ON
:INITiate:CONTinuous?
Continuous Measurement Query

Function
Queries measurement mode

Query
:INITiate:CONTinuous?

Response
<switch>

Parameter
<switch> Capture Mode
0 Single Measurement
1 Continuous Measurement

Usage Example
To query measurement mode
INIT:CONT?
> 0

:INITiate:MODE:SINGLE
Single Measurement

Functions
Starts measurement in Single Measurement mode

Command
:INITiate:MODE:SINGLE

Usage Example
To start measurement in Single Measurement mode
INIT:MODE:SING
2.5  Common Measurement Functions

:INITiate:MODE:CONTinue
Continuous Measurement

Function
Starts measurement in Continuous Measurement mode

Command
:INITiate:MODE:CONTinue

Usage Example
To start measurement in Continuous Measurement mode
INIT:MODE:CONT

:INITiate[:IMMediate]
Initiate

Function
Starts measurement using current mode

Command
:INITiate[:IMMediate]

Usage Example
To start measurement
INIT
Chapter 2  SCPI Device Message Details

:CONFigure?
Configure Query

Function
Queries current mode

Query
:CONFigure?

Response
<mode>

Parameter
<mode>  Measurement Function
  EVM   Modulation Analysis
  ACP   ACP Measurement
  SEM   SEM Measurement
  OBW   OBW Measurement

Usage Example
To query current measurement mode
CONF?
2.5.2 Trigger Switch

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

Trigger Switch

Function

Sets trigger switch to On or Off

Command

:TRIGger[:SEQUence][:STATe] <switch>

Parameter

<switch>  Triggering
   OFF|0  No Triggering (default)
   ON|1  Triggering

Details

This command differs from panel operation because the measurement does not start at command execution.

Usage Example

To set trigger switch to On
TRIG ON

:TRIGger[:SEQUence][:STATe]?

Trigger Switch Query

Function

Queries trigger switch state

Query

:TRIGger[:SEQUence][:STATe]?

Response

<switch>

Parameter

<switch>  Trigger State
   0  No Triggering
   1  Triggering Required

Usage Example

To query Trigger switch
TRIG?
> 0
2.5.3 Trigger Source

:TRIGger[:SEQuence]:SOURce EXTernal[1|2]|EXT2|IMMediate|SG

Trigger Source

Function

Sets trigger signal source

Command

:TRIGger[:SEQuence]:SOURce <source>

Parameter

<source> Trigger Source
EXTernal[1] External Input
EXTernal2|EXT2 External Input 2
IMMediate Free Run
SG SG Marker

Details

The SG marker trigger source is only enabled when the Vector Signal Generator option is installed. This command differs from panel operation because measurement does not start at command execution. External Input 2 is selectable only for MS2850A.

Usage Example

Sets trigger source to external input 2.
TRIG:SOUR EXT2

Related Command

This related command operates on the same parameter.
:TRIGger:EVM:SOURce EXTernal[1|2]|EXT2|IMMediate|SG
2.5 Common Measurement Functions

:TRIGGER[:SEQUENCE]:SOURce?
Trigger Source Query

Function
Queries trigger signal source

Query
:TRIGGER[:SEQUENCE]:SOURce?

Response
<source>

Parameter
<source>  Trigger Source
  EXT    External Input
  EXT2   External Input 2
  IMM    Free Run
  SG     SG Marker

Details
The SG marker trigger source is only enabled when the Vector Signal Generator option is installed. This command differs from panel operation because the measurement does not start at command execution.

Usage Example
To query trigger source
TRIG:SOUR?
> EXT

Related Command
This related command operates on the same parameter.
:TRIGger:EVM:SOURce?
Chapter 2  SCPI Device Message Details

:TRIGger:EVM:SOURce EXTernal[1|2]|EXT2|IMMediate|SG

Trigger Source

Function

Sets trigger signal source

Refer to:

TRIGger[:SEQUence]:SOURce <source>

Related Command

This related command operates on the same parameter.

:TRIGger[:SEQUence]:SOURce
EXTernal[1|2]|EXT2|IMMediate|SG

:TRIGger:EVM:SOURce?

Trigger Source Query

Function

Queries trigger signal source

Refer to:

TRIGger[:SEQUence]:SOURce?

Related Command

This related command operates on the same parameter.

:TRIGger[:SEQUence]:SOURce?
2.5.4 Trigger Slope

:TRIGger[:SEQuence]:SLOPe POSitive|NEGative

**Trigger Slope**

Function

Sets trigger detection (rising/falling edge)

Command

:TRIGger[:SEQuence]:SLOPe <mode>

Parameter

<mode> Trigger Detection
  POSitive Rising Edge Detection (default)
  NEGative Falling Edge Detection

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set trigger detection to rising edge
TRIG:SLOP POS

:TRIGger[:SEQuence]:SLOPe?

**Trigger Slope Query**

Function

Queries trigger detection (rising/falling edge)

Query

:TRIGger[:SEQuence]:SLOPe?

Response

<mode>

Parameter

<mode> Trigger Detection
  POS Rising Edge Detection (default)
  NEG Falling Edge Detection

Usage Example

To query trigger detection
TRIG:SLOP?
  > POS
2.5.5 Trigger Delay

:\TRIgger[:\SEQuence]:DE\La y <time>

Trigger Delay

Function
Sets delay from trigger to start of capture

Command
:\TRIgger[:\SEQuence]:DE\La y <time>

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;time&gt;</td>
<td>Delay time from trigger to start of capture</td>
</tr>
<tr>
<td>Range</td>
<td>−0.5 to 0.5 seconds</td>
</tr>
<tr>
<td>Resolution</td>
<td>50 nanoseconds</td>
</tr>
<tr>
<td>Suffix Code</td>
<td>NS, US, MS, S</td>
</tr>
<tr>
<td>Initial Value</td>
<td>0 seconds</td>
</tr>
</tbody>
</table>

Without a suffix code, the input value is assumed to be in seconds.

Details
This command differs from panel operation because measurement does not start at command execution.

Usage Example
To set trigger delay to 20 milliseconds
TRIG:DEL 20MS
2.5 Common Measurement Functions

:TRIGger[:SEQUence]:DElay?
Trigger Delay Query

Function
queries delay from trigger to start of capture

Query
:TRIGger[:SEQUence]:DElay?

Response
<time>

Parameter
<time> Delay from trigger to start of capture
  Range −0.5 to 0.5 seconds
  Resolution 50 nanoseconds
  The returned value is in seconds.

Usage Example
To query Trigger delay
TRIG:DEL?
> 0.02000000
2.6 ACP/OBW/SEM Measurement Functions

Table 2.6-1 lists the device messages to call the Adjacent Channel Power (ACP), Occupied Bandwidth (OBW), and Spectrum Emission Mask (SEM) measurement functions. The spectrum analyzer and signal analyzer applications must be preloaded.

See the “MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Main Frame Remote Control)” for the Query commands used after these functions are called.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure – ACP</td>
<td>:CONFigure[:FFT]:SWEpt:ACP</td>
</tr>
<tr>
<td>Configure – OBW</td>
<td>:CONFigure[:FFT]:SWEpt:OBWidth</td>
</tr>
<tr>
<td>Configure – SEM</td>
<td>:CONFigure[:SWEpt]:SEM</td>
</tr>
<tr>
<td>Using application for ACP</td>
<td>[:SENSe]:ACPower:INStrument[:SELect] FFT</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:ACPower:INStrument[:SELect]?</td>
</tr>
</tbody>
</table>
| Using application for OBW | [:SENSe]:OBWidth:INStrument[:SELect] FFT|SWEpt |}

<table>
<thead>
<tr>
<th>Device Message</th>
</tr>
</thead>
</table>
| [:SENSe]:OBWidth:INStrument[:SELect]?

Table 2.6-1  Device Messages for ACP, OBW and SEM Functions
2.6 ACP/OBW/SEM Measurement Functions

:CONFigure[:FFT]:SWEPt]:ACP
Adjacent Channel Power Configure

Function

Selects adjacent channel power (ACP) measurement function.

If FFT|SWEPt is omitted, the measurement mode set previously by the [:SENSe]:ACPower:INStRument[:SELection] command is used.

Command

:CONFigure[:FFT]:SWEPt]:ACP

Details

No measurement is made.

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.

Usage Example

To select ACP function of spectrum analyzer
CONF:SWEP:ACP

:CONFigure[:FFT]:SWEPt]:OBWidth
Occupied Bandwidth Configure

Function

Selects occupied bandwidth (OBW) measurement function.

If FFT|SWEPt is omitted, the measurement mode set previously by the [:SENSe]:OBWidth:INStRument[:SELection] command is used.

Command

:CONFigure[:FFT]:SWEPt]:OBWidth

Details

No measurement is made.

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.

Usage Example

To select OBW function of spectrum analyzer
CONF:SWEP:OBW
Chapter 2  SCPI Device Message Details

:CONFigure[:SWEPt]:SEM
Spectrum Emission Mask Configure

Function
Selects spectrum emission mask (SEM) measurement function of spectrum analyzer

Command
:CONFigure[:SWEPt]:SEM

Usage Example
To select SEM measurement function of spectrum analyzer
CONF:SWEP:SEM

[:SENSe]:ACPower:INSTrument[:SELect] FFT|SWEPt
Measurement Method for ACP

Function
Sets measurement mode when :CONfigure:ACP is executed

Command
[:SENSe]:ACPower:INSTrument[:SELect] <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Measurement Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFT</td>
<td>Signal Analyzer Function</td>
</tr>
<tr>
<td>SWEPt</td>
<td>Spectrum Analyzer Function (default)</td>
</tr>
</tbody>
</table>

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

Usage Example
To use signal analyzer when ACP function executed
ACP:INST SWEP
[:SENSe]:ACPower:INSTrument[:SELect]?
Measurement Method for ACP Query

Function
Queries measurement mode when :CONFigure:ACP is executed

Command
[:SENSe]:ACPower:INSTrument[:SELect]?

Response
<mode>

Parameter
<mode> Measurement Mode
FFT Signal Analyzer Function
SWEP Spectrum Analyzer Function (default)

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

Usage Example
To query measurement mode for ACP
ACP:INST?
> FFT
Chapter 2  SCPI Device Message Details

[:SENSe]:OBWidth:INSTrument[:SELect] FFT|SWEP
Measurement Method for OBW

Function
Sets measurement mode when :CONFigure:OBWidth is executed

Command
[:SENSe]:OBWidth:INSTrument[:SELect] <mode>

Parameter

<mode>  Measurement mode
FFT     Signal Analyzer Function
SWEPt   Spectrum Analyzer Function (default)

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

Usage Example
To use signal analyzer when OBW function executed

OBW:INST SWEP
[:SENSe]:OBWidth:INSTrument[:SELect]?

Measurement Method for OBW

Function
Queries measurement mode when :CONFigure:OBWidth is executed

Command
[:SENSe]:OBWidth:INSTrument[:SELect]?

Response
<mode>

Parameter
<mode> Measurement Mode
FFT Signal Analyzer Function
SWEP Spectrum Analyzer Function (default)

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

Usage Example
To query measurement mode for OBW
OBW:INST?
> FFT
2.7 Modulation Analysis Function

This section describes the device messages for the modulation analysis function of this application.

Table 2.7-1 lists the execution and query commands for modulation analysis.

Table 2.7-1  Devices Messages at Executing Modulation Analysis and Reading Results

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure</td>
<td>:CONFigure:EVM</td>
</tr>
<tr>
<td>Initiate</td>
<td>:INITiate:EVM</td>
</tr>
<tr>
<td>Fetch</td>
<td>:FETCh:EVM[n]?</td>
</tr>
<tr>
<td>Read/Measure</td>
<td>:READ:EVM[n]?</td>
</tr>
<tr>
<td></td>
<td>:MEASure:EVM[n]?</td>
</tr>
</tbody>
</table>
2.7 Modulation Analysis Function

Table 2.7-2 lists the response for parameter \( n \) in Table 2.7-1.

Table 2.7-2  Response for Modulation Analysis Result

<table>
<thead>
<tr>
<th>( n )</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
</table>
| 1 or at omission | A | Measurement results are returned, starting from TS0 of Carrier 1, in the following order separated by a comma (,). \(<6*7*16>\)
When target time slot is Burst \(<16>\)
1. RMS EVM (Average)(float) [%]
2. RMS EVM (Max)(float) [%]
3. Peak EVM (Average)(float) [%]
4. Peak EVM (Max)(float) [%]
5. Chip number at peak EVM (Off)(int) [chip]
6. Peak CDE (Average)(float) [dB]
7. Peak CDE (Max)(float) [dB]
8. Frequency Error (Average)(float) [Hz]
(Returns 999999999999 when unable to perform measurement)
9. Frequency Error (Max)(float) [Hz]
(Returns 999999999999 when unable to perform measurement)
10. I/Q Origin Offset (Average)(float) [dB]
11. I/Q Origin Offset (Max)(float) [dB]
12. SF of Peak CDE (Max)(int) [NA]
13. Channel of Peak CDE (Max)(int) [NA]
14. Number of Active Channel (Off)(int) [NA]
15. Mean Power (Average)(float) [dBm]
16. Mean Power (Max)(float) [dBm] |
### Table 2.7-2  Response for Modulation Analysis Result (Cont’d)

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
</table>
| 1 or at omission | B | Measurement results for the target slot of the target carrier are returned in the following order separated by a comma (,). <34>
1. –999.0
2. –999.0
3. RMS EVM (Average) (float) [%]
4. RMS EVM (Max) (float) [%]
5. Peak EVM (Average) (float) [%]
6. Peak EVM (Max) (float) [%]
7. –999.0
8. –999.0
9. –999.0
10. –999.0
11. –999.0
12. –999.0
13. –999.0
14. –999.0
15. Peak CDE (Average) (float) [dB]
16. Peak CDE (Max) (float) [dB]
17. –999.0
18. –999.0
19. Frequency Error (Average) (float) [Hz]
(Returns 999999999999 when unable to perform measurement)
20. Frequency Error (Max) (float) [Hz]
(Returns 999999999999 when unable to perform measurement)
21. I/Q Origin Offset (Average) (float) [dB]
22. I/Q Origin Offset (Max) (float) [dB]
23. –999.0
24. –999.0
25. –999.0
26. –999.0
27. –999.0
28. –999.0
29. SF of Peak CDE (Max) (int) [NA]|
### Table 2.7-2  Response for Modulation Analysis Result (Cont’d)

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
</table>
| 1 or at omission | B           | 30. Channel of Peak CDE (Max) (int) [NA]  
|         |             | 31. –999.0  
|         |             | 32. –999.0  
|         |             | 33. –999.0  
|         |             | 34. Mean Power (Average) (float) [dBm] |
| 8       | A           | Code Length Vector (Off) (int) [NA] <6*7*16>  
|         |             | Code domain measurement results of each time slot are separated into 16 fields and are returned separated by commas (,). Results, in this case SF values (2,4,8,16), are returned starting from TS0 of Carrier 1.  
|         |             | (When target time slot is Burst <16>)  
|         |             | (Example) {2, 2, 2, 2, 2, 2, 2, 4, 4, 4, 4, 16, 16, 8, 8, …} |
|         | B           | Code Length Vector (Off) (int) [NA] <16>  
|         |             | Code domain measurement results for the target slot of the target carrier are separated into 16 fields and are returned separated by commas (,). SF values (2,4,8,16) are returned.  
|         |             | (Example) {2, 2, 2, 2, 2, 2, 2, 4, 4, 4, 4, 16, 16, 8, 8} |
| 9       | A           | Active Flag Vector (Off) (int) [NA] <6*7*16>  
|         |             | Code domain measurement results of each time slot are separated into 16 fields and are returned separated by commas (,). Results, in this case Active Channels, are returned starting from TS0 of Carrier 1.  
|         |             | (When target time slot is Burst <16>)  
|         |             | (Example) {1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 1, 0, 1, 1, …} |
|         | B           | Active Flag Vector (Off) (int) [NA] <16>  
|         |             | Code domain measurement results for the target slot of the target carrier are separated into 16 fields and are returned separated by commas (,). Active channels are returned.  
|         |             | (Example) {1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 1, 0, 1} |
### Table 2.7-2  Response for Modulation Analysis Result (Cont’d)

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
</table>
| 11 | A | Code Domain Power (Off) (float) [dB] <6*7*16>  
Code domain measurement results of each time slot are separated into 16 fields and are returned separated by commas (.). Results, in this case Code Domain Power, are returned starting from TS0 of Carrier 1.  
(When target time slot is Burst <16>)  
(Example) {P1, P1, P1, P1, P1, P1, P1, P1, –999.0, –999.0, –999.0, –999.0, P2, –999.0, P3, P3, ...} |
| 11 | B | Code Domain Power (Off) (float) [dB] <16>  
Code domain measurement results for the target slot of the target carrier are separated into 16 fields and are returned separated by commas (.). Code domain powers are returned.  
(Example) {P1, P1, P1, P1, P1, P1, P1, P1, –999.0, –999.0, –999.0, –999.0, P2, –999.0, P3, P3} |
| 12 | A | Code Domain Error (Off) (float) [dB] <6*7*16>  
Code domain measurement results of each time slot are separated into 16 fields and are returned separated by commas (.). Results, in this case Code Domain Error, are returned starting from TS0 of Carrier 1.  
(When target time slot is Burst <16>)  
(Example) {E1, E1, E1, E1, E1, E1, E1, E1, –999.0, –999.0, –999.0, –999.0, E2, –999.0, E3, E3, ...} |
| 12 | B | Code Domain Error (Off) (float) [dB] <16>  
Code domain measurement results for the target slot of the target carrier are separated into 16 fields and are returned separated by commas (.). Code Domain Errors are returned.  
(Example) {E1, E1, E1, E1, E1, E1, E1, E1, –999.0, –999.0, –999.0, –999.0, E2, –999.0, E3, E3} |
| 13 | A | Multi Slot Mean Power (Average, Max) (float) [dBm] <2*6*9>  
Mean power results, starting from TS0 of Carrier 1, are returned separated by commas (.).  
TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6, ... |
| 13 | B | Multi Slot Mean Power (Average) (float) [dBm] <9>  
Mean power results for the target slot of the target carrier are returned separated by commas (.).  
TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6 |
### Table 2.7-2  Response for Modulation Analysis Result (Cont’d)

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
</table>
| 14 | A           | Multi Slot Midamble Power (Average, Max) (float) [dBm] <2*6*9>  
Midamble power results, starting from TS0 of Carrier 1, are returned separated by commas (,).  
TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6, …  
Mean powers are returned for DwPTS and UpPTS. |
|    | B           | Multi Slot Midamble Power (Average) (float) [dBm] <9>  
Midamble power results for the target carrier are returned separated by commas (,).  
TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6  
Mean Powers are returned for DwPTS and UpPTS. |
| 15 | A           | Multi Slot Data1 Power (Average, Max) (float) [dBm] <2*6*9>  
Data1 power results, starting from TS0 of Carrier 1, are returned separated by commas (,).  
TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6, …  
Mean powers are returned for DwPTS and UpPTS. |
|    | B           | Multi Slot Data1 Power (Average) (float) [dBm] <9>  
Data1 power results for the target carrier are returned separated by commas (,).  
TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6  
Mean powers are returned for DwPTS and UpPTS. |
| 16 | A           | Multi Slot Data2 Power (Average, Max) (float) [dBm] <2*6*9>  
Data2 power results, starting from TS0 of Carrier 1, are returned separated by commas (,).  
TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6, …  
Mean powers are returned for DwPTS and UpPTS. |
|    | B           | Multi Slot Data2 Power (Average) (float) [dBm] <9>  
Data2 power results for the target carrier are returned separated by commas (,).  
TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6  
Mean powers are returned for DwPTS and UpPTS. |
Table 2.7-2  Response for Modulation Analysis Result (Cont’d)

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>A</td>
<td>Time Slot Active Flag (Off)(int) [NA] &lt;6*9&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active time slot results, starting from Carrier 1, are returned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>separated by commas (,).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6, …</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Example) {1, 1, 0, 0, 0, 0, 1, 1, 1, …}</td>
</tr>
<tr>
<td>20</td>
<td>A/B</td>
<td>Time Slot Active Flag (Off)(int) [NA] &lt;9&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active time slot results for the target carrier are returned separated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>by commas (,).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TS0, DwPTS, UpPTS, TS1, TS2, TS3, TS4, TS5, TS6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Example) {1, 1, 0, 0, 0, 0, 1, 1, 1, }</td>
</tr>
<tr>
<td>21</td>
<td>A/B</td>
<td>Multi Carrier Power (Average, Max)(float) [dBm] &lt;2<em>6</em>9&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean powers of the time slots of the six carriers are returned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>separated by commas (,).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If there is no carrier, the power of the time slots returns –999.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subframe Total Power (Average, Max) (float) [dBm] &lt;2*6&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The subframe total power of the six carriers are returned separated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>by commas (,).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>–999.0 is returned when there are no measurement results.</td>
</tr>
</tbody>
</table>

For details of the Result Mode, see SYSTem:RESult:MODE in the Main Frame Remote Control Manual.
Table 2.7-3 lists the commands for setting modulation analysis parameters.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Mode</td>
<td>:DISPlay:EVM:VIEW[:SELect] CDP</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:EVM:VIEW[:SELect]?</td>
</tr>
<tr>
<td>Storage Mode</td>
<td>[:SENSe]:EVM:AVERage[:STAtE] OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:AVERage[:STAtE]?</td>
</tr>
<tr>
<td>Storage Count</td>
<td>[:SENSe]:EVM:AVERage:COUNt &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:AVERage:COUNt?</td>
</tr>
</tbody>
</table>

Table 2.7-4 lists marker settings and query commands for a marker position on the Constellation Diagram.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker – On/Off</td>
<td>:CALCulate:MARKer[:STAtE] ON</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:MARKer[:STAtE]?</td>
</tr>
<tr>
<td>Active Trace</td>
<td>:CALCulate:EVM:MARKer:ACTive CONStellation</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:EVM:MARKer:ACTive?</td>
</tr>
<tr>
<td>Constellation – Chip Number</td>
<td>:CALCulate:EVM:MARKer:CHIP &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:EVM:MARKer:CHIP?</td>
</tr>
<tr>
<td>Marker X-axis Value</td>
<td>:CALCulate:EVM:MARKer:X?</td>
</tr>
<tr>
<td>Marker Y-axis Value</td>
<td>:CALCulate:EVM:MARKer:Y?</td>
</tr>
</tbody>
</table>
Table 2.7-5 lists the commands for setting the vertical scale of the Code Domain Graph.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale – CDP</td>
<td>:DISPlay:EVM:WINDow[1]:TRACe:Y[:SCALe]:RLEVel 20</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:EVM:WINDow[1]:TRACe:Y[:SCALe]:RLEVel?</td>
</tr>
<tr>
<td>Scale – CDE</td>
<td>:DISPlay:EVM:WINDow2:TRACe:Y[:SCALe]:RLEVel 20</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:EVM:WINDow2:TRACe:Y[:SCALe]:RLEVel?</td>
</tr>
</tbody>
</table>

Table 2.7-6 lists marker settings and query commands for a marker position on the Code Domain Graph.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker Position</td>
<td>:CALCulate:EVM:CDPower:MARKer:CODE &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:EVM:CDPower:MARKer:CODE?</td>
</tr>
<tr>
<td>Marker Channel</td>
<td>:CALCulate:EVM:CDPower:MARKer:X:CHANnel?</td>
</tr>
<tr>
<td>Marker Spreading Factor</td>
<td>:CALCulate:EVM:CDPower:MARKer:X:SFActor?</td>
</tr>
<tr>
<td>Marker Modulation Scheme</td>
<td>:CALCulate:EVM:CDPower:MARKer:X:MODulation?</td>
</tr>
<tr>
<td>Marker Y-axis Value –</td>
<td></td>
</tr>
<tr>
<td>CDP or CDE Level</td>
<td>:CALCulate:EVM:CDPower:MARKer:Y?</td>
</tr>
</tbody>
</table>
2.7 Modulation Analysis Function

2.7.1 Measure

:CONFigure:EVM

Modulation Analysis

Function

Sets measurement mode to modulation analysis

Command

:CONFigure:EVM

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set measurement mode to modulation analysis

CONF:EVM

:INITiate:EVM

Modulation Analysis Initiate

Function

Starts modulation analysis

Command

:INITiate:EVM

Usage Example

To start modulation analysis

INIT:EVM
Chapter 2  SCPI Device Message Details

:FETCh:EVM[n]?
Modulation Analysis Read Fetch

Function
Reads modulation analysis results from modulation analysis display

Query
:FETCh:EVM[n]?

Response
See Table 2.7-2.

Details
This command returns –999.0 when unable to perform measurement. This command outputs modulation analysis measurement results from the last measurement. It only outputs the measurement result and does not execute any measurement function itself. Use the READ command to execute measurement and output the result simultaneously.

:READ:EVM[n]?
Modulation Analysis Read

Function
Performs modulation analysis and outputs results

Related Command
The following command operates on the same parameter.
:MEASure:EVM[n]?

:MEASure:EVM[n]?
Modulation Analysis Measure

Function
Performs modulation analysis and outputs results

Related Command
The following command operates on the same parameter.
:READ:EVM[n]?
2.7.2 Trace Mode

:DISPlay:EVM[:VIEW][:SELect] CDP|CDE|MSLot|MCPower

Trace Mode/Constellation Select/Code Domain Graph Select

Function

Sets modulation analysis trace mode

Command

:DISPlay:EVM[:VIEW][:SELect] <mode>

Parameter

<mode> Trace Mode
CDP Code Domain Power (default)
CDE Code Domain Error
MSLot Multi Slot Power
MCPower Multi Carrier Power

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set trace mode to Multi Slot Power
DISP:EVM MSL
Chapter 2  SCPI Device Message Details

:DISPlay:EVM[:VIEW][:SELect]?
Trace Mode/Constellation Select/Code Domain Graph Select Query

Function

Queries modulation analysis trace mode

Query

:DISPlay:EVM[:VIEW][:SELection]?

Response

<mode>

Parameter

<mode> Trace Mode
CDP Code Domain Power
CDE Code Domain Error
MSL Multi Slot Power
MCP Multi Carrier Power

Usage Example

To query trace mode
DISP:EVM?
> MSL
2.7.3 Storage Mode
[:SENSe]:EVM:AVERage[:STATe] OFF|ON|AMAXimum|0|1|2

Storage Mode for Modulation Analysis

Function
Sets modulation analysis results display method

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

Parameter
<mode> Display Method
OFF|0 Normal (Default)
ON|1 Results averaged for interval specified in Average Count and then displayed
AMAXimum|2 Average & Max

Details
This command differs from panel operation because measurement does not start at command execution.

Usage Example
To set result display method to Average
EVM:AVER ON
[:SENSe]:EVM:AVERage[:STATe]?

Storage Mode for Modulation Analysis Query

Function

Queries modulation analysis results display method

Query

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

Response

<mode>

Parameter

<mode> Display Method
0 Normal (Default)
1 Average
   Results averaged for interval specified in Average Count and then displayed
2 Average & Max
   Results averaged for interval specified in Average Count and then displayed with Maximum result values

Usage Example

To query display method
EVM:AVER?
> ON
2.7.4 Storage Count

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

Average Count for Modulation Analysis

Function

Sets averaging interval when Storage Mode set to Average or Average & Max.

Command

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

Parameter

<integer> Storage Count (Averaging interval)

Range 2 to 9999

Details

This command differs from panel operation because measurement does not start at command execution.

Usage Example

To set Storage Count (averaging interval) to 50

EVM:AVER:COUN 50
[:SENSe]:EVM:AVERage:COUNt?
Average Count for Modulation Analysis Query

Function
Queries averaging interval when Storage Mode set to Average or Average & Max.

Query
[:SENSe]:EVM:AVERage:COUNt?

Response
<integer>

Parameter
<integer> Storage Count (Averaging interval)
  Range 2 to 9999

Usage Example
To query Storage Count
EVM:AVER:COUN?
> 50
2.7.5 Marker – ON/OFF

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

Marker On/Off

Function

Sets marker On or Off

Command

:CALCulate:MARKer[:STATe] <mode>

Parameter

<mode>          Marker ON/OFF
  ON|1             Positions marker at entry state (default)
  OFF|0           Does not display marker and releases position

Usage Example

To display marker
CALC:MARK ON

:CALCulate:MARKer[:STATe]?  

Marker On/Off Query

Function

Queries marker state

Query

:CALCulate:EVM:MARKer[:STATe]?

Response

<mode>

Parameter

<mode>          Marker On/Off
  1               Positions marker at entry state (default)
  0            Does not display marker and releases position

Usage Example

To query marker state
CALC:MARK?
> 1
2.7.6 Active Trace

:CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom
Constellation Select/Bottom Graph Select

Function

Sets marker operation graph

Command

:CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom

Parameter

<switch>

Marker

CONStellation Constellation Select (default)

BOTTom Bottom Graph Select

Usage Example

To set marker on Constellation Diagram
CALC:EVM:MARK:ACT CONS

:CALCulate:EVM:MARKer:ACTive?
Constellation Select/Bottom Graph Select Query

Function

Queries marker operation graph

Query

:CALCulate:EVM:MARKer:ACTive

Response

<mode>

Parameter

<mode>

Active Trace

CONS Constellation Select

BOTT Bottom Graph Select

Usage Example

To query marker operation graph (Active Trace)
CALC:CDP:MARK:ACT?
> CONS
2.7.7 Constellation Chip Number

:CALCulate:EVM:MARKer:CHIP <integer>

Marker Position for Constellation

Function

Sets marker position on Constellation Diagram during modulation analysis

Command

:CALCulate:EVM:MARKer:CHIP <integer>

Parameter

<integer>  Chip Position
Range  0 to 847 Chip
Initial Value  Graph left end (0)
Resolution  1
Suffix Code  None

Usage Example

To set marker position to Chip number 60
CALC:EVM:MARK:CHIP 60
Chapter 2  SCPI Device Message Details

:CALCulate:EVM:MARKer:CHIP?
Marker Position for Constellation Query

Function
Queries marker position on Constellation Diagram during modulation analysis

Query
:CALCulate:EVM:MARKer:CHIP?

Response
<integer>

Parameter

<integer>  Chip Position
Range  0 to 847 Chip
Initial Value  Graph left end (0)
Resolution  1
Suffix Code  None

Usage Example
To query marker position
CALC:EVM:MARK:CHIP?
> 60
2.7.8 Marker X-axis Value

:CALCulate:EVM:MARKer:X?

Marker Level for Constellation – Query

Function

Queries X coordinate value (I value) at marker position on Constellation Diagram

When the marker display is off, the character string "NAN" is returned.

Query

:CALCulate:EVM:MARKer:X?

Response

<real>

Parameter

<real> X coordinate (I value) at marker position on Constellation Diagram

Usage Example

To query X coordinate value at marker position on Constellation Diagram
CALC:EVM:MARK:X?
> 0.1234
2.7.9 Marker Y-axis Value
:CALCulate:EVM:MARKer:Y?
Marker Level for Constellation – Query

Function
Queries Y coordinate value (Q value) at marker position on Constellation Diagram

When the marker display is off, the character string "NAN" is returned.

Query
:CALCulate:EVM:MARKer:Y?

Response
<real>

Parameter
<real> Y coordinate (Q value) at marker position on Constellation Diagram

Usage Example
To query Y coordinate value at marker position on Constellation Diagram
CALC:EVM:MARK:Y?
> 0.1234
2.7.10 Scale – Code Domain Power

:DISPlay:EVM[:VIEW]:WINDow[1]:TRACe:Y[:SCALe]:RLEVel 20|40|60|80

Vertical Scale of Code Domain Power

Function

Sets vertical scale of Code Domain Power Trace display

Command

:DISPlay:EVM[:VIEW]:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <rel_ampl>

Parameter

<table>
<thead>
<tr>
<th>&lt;rel_ampl&gt;</th>
<th>CDP Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>−20 to 0 dB</td>
</tr>
<tr>
<td>40</td>
<td>−40 to 0 dB</td>
</tr>
<tr>
<td>60</td>
<td>−60 to 0 dB (default)</td>
</tr>
<tr>
<td>80</td>
<td>−80 to 0 dB</td>
</tr>
</tbody>
</table>

Usage Example

To set Code Domain Power Display range from −40 to 0 dB
DISP:EVM:WIND:TRAC:Y:RLEV 40


**Chapter 2  SCPI Device Message Details**

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

Vertical Scale of Code Domain Power Query

**Function**

Queries vertical scale of Code Domain Power Trace display

**Query**

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

**Response**

<rel_ampl>

**Parameter**

<rel_ampl> CDP Range

20  –20 to 0 dB

40  –40 to 0 dB

60  –60 to 0 dB (default)

80  –80 to 0 dB

**Usage Example**

To query vertical scale of Code Domain Power Trace display

DISP:EVM:WIND:TRAC:Y:RLEV?

> 40
2.7.11 Scale – Code Domain Error

:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel 20|40|60|80

Vertical Scale of Code Domain Error

Function

Sets vertical scale of Code Domain Error Trace display

Command

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

Parameter

<table>
<thead>
<tr>
<th>&lt;rel_ampl&gt;</th>
<th>CDE Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>–80 to –60 dB</td>
</tr>
<tr>
<td>40</td>
<td>–80 to –40 dB</td>
</tr>
<tr>
<td>60</td>
<td>–80 to –20 dB (default)</td>
</tr>
<tr>
<td>80</td>
<td>–80 to 0 dB</td>
</tr>
</tbody>
</table>

Usage Example

To set Code Domain Error Display range from –80 to –40 dB

DISP:EVM:WIND2:TRAC:Y:RLEV 40
:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel?

Vertical Scale of Code Domain Error Query

Function
Queries vertical scale of Code Domain Error Trace display

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

Response
<rel_ampl>

Parameter
<rel_ampl> CDE Range
20 −80 to −60 dB
40 −80 to −40 dB
60 −80 to −20 dB (default)
80 −80 to 0 dB

Usage Example
To query vertical scale of Code Domain Error Trace display
DISP:EVM:WIND2:TRAC:Y:RLEV?
> 40
2.7 Modulation Analysis Function

2.7.12 Marker Position

:CALCulate:EVM:CDPower:MARKer:CODE <integer>

Marker Position for Code Domain

Function

Sets marker position on Code Domain Trace display

Command

:CALCulate:EVM:CDPower:MARKer:CODE <integer>

Parameter

Parameter																						Parameter
<integer>		Marker Position
Range		0 to (SF−1)
Initial Value	0
Resolution	1
Suffix Code	None

Usage Example

To set marker to starting code of Code Domain Trace display
CALC:EVM:CDP:MARK:CODE 0

:CALCulate:EVM:CDPower:MARKer:CODE?

Marker Position for Code Domain Query

Function

Queries marker position on Code Domain Trace display

Query

:CALCulate:EVM:CDPower:MARKer:CODE?

Response

<integer>

Parameter

Parameter																						Parameter
<integer>		Marker Position
Range		0 to (SF−1)
Initial Value	0
Resolution	1
Suffix Code	None

Usage Example

To query marker position on Code Domain Trace display
CALC:EVM:CDP:MARK:CODE?
> 0
2.7.13 Marker Channel

:CALCulate:EVM:CDPower:MARKer:X:CHANnel?

Marker Channel for Code Domain Query

Function

Queries channel number of current marker position on Code Domain Trace display

Query

:CALCulate:EVM:CDPower:MARKer:X:CHANnel?

Response

<integer>

Parameter

<integer> Channel
Range 1 to SF
Resolution 1
Suffix Code None

Usage Example

To query channel number of marker position on Code Domain Trace display

CALC:EVM:CDP:MARK:X:CHAN?

> 1
2.7 Modulation Analysis Function

2.7.14 Marker Spreading Factor

:CALCulate:EVM:CDPower:MARKer:X:SFACtor?

Marker Spreading Factor for Code Domain Query

Function

Queries SF of current marker position on Code Domain Trace display

Query

:CALCulate:EVM:CDPower:MARKer:X:SFACtor?

Response

<integer>

Parameter

<integer> Marker Position

Range 1, 2, 4, 8, 16
Resolution 1
Suffix Code None

Usage Example

To query SF of marker position on Code Domain Trace display

CALC:EVM:CDP:MARK:X:SFAC?

> 16
2.7.15 Marker Modulation

:CALCulate:EVM:CDPower:MARKer:X:MODulation?
Marker Modulation for Code Domain Query

Function
Queries Modulation Scheme of current marker position on Code Domain Trace display

Query
:CALCulate:EVM:CDPower:MARKer:X:MODulation?

Response

Response

Parameter

```
<mode>
```
Modulation
QPSK   QPSK
16Q    16QAM
16QP   16QAM&QPSK
NONE   None(Inactive)

Usage Example
To query the Modulation scheme of marker position on Code Domain Trace display
CALC:EVM:CDP:MARK:X:MOD?
> QPSK
2.7.16 Marker Y-axis Value – CDP or CDE Level

:CALCulate:EVM:CDPower:MARKer:Y?

Marker Level for Code Domain

**Function**

Queries CDP or CDE at marker position on Code Domain Trace display

**Query**

:CALCulate:EVM:CDPower:MARKer:Y?

**Response**

<real>

**Parameter**

<real> Marker Level/Error
Resolution 0.01 dB

**Usage Example**

To query CDP or CDE at marker position 1
CALC:EVM:CDP:MARK:CODE 1
CALC:EVM:CDP:MARK:Y?
> -10.62
2.8 Power vs Time Function

This section describes the device messages for the Power vs Time function of this application.

Table 2.8-1 lists the execution and query commands for Power vs Time.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure</td>
<td>:CONFigure:PVT</td>
</tr>
<tr>
<td>Initiate</td>
<td>:INITiate:PVT</td>
</tr>
<tr>
<td>Fetch</td>
<td>:FETCh:PVT[n]?</td>
</tr>
<tr>
<td>Read/Measure</td>
<td>:READ:PVT[n]?</td>
</tr>
<tr>
<td></td>
<td>:MEASure:PVT[n]?</td>
</tr>
</tbody>
</table>
Table 2.8-2 lists the response for parameter $n$ in Table 2.8-1.

### Table 2.8-2 Response for Power vs Time Result

<table>
<thead>
<tr>
<th>$n$</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or at omission</td>
<td>A</td>
<td>Measurement results are returned in the following order separated by a comma (,).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Time Mask judgement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Off power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. On Power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. $-999.0$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. TS0 time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. DwPTS time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. UpPTS time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. TS1 time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. TS2 time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. TS3 time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. TS4 time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. TS5 time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13. TS6 time slot power [dBm]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14. to 40. $-999.0$</td>
</tr>
</tbody>
</table>

Table 2.8-3 lists the commands for setting Power vs Time parameters.

### Table 2.8-3 Device Messages for Setting Modulation Analysis Parameters

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide Dynamic Range</td>
<td>[:SENSe]:PVTime:WDRange OFF</td>
</tr>
<tr>
<td>Noise Correction</td>
<td>[:SENSe]:PVTime:NCORrection OFF</td>
</tr>
<tr>
<td>Pre-Amp Mode</td>
<td>[:SENSe]:PVTime:PAMode OFF</td>
</tr>
<tr>
<td>Select Mask</td>
<td>[:SENSe]:PVTime:MASK:SELet STANdard</td>
</tr>
</tbody>
</table>
Table 2.8-3  Device Messages for Setting Modulation Analysis Parameters

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mask Setup</td>
<td>[:SENSe]:PVTime:MASK:LIST:DL:TIME &lt;time_1&gt;,&lt;time_2&gt;,&lt;time_3&gt;,&lt;time_4&gt;,&lt;time_5&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:DL:TIME</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:DL:LIMit:ABSolute &lt;level_1&gt;,&lt;level_2&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:DL:LIMit:ABSolute</td>
</tr>
<tr>
<td>Load Standard Setting</td>
<td>[:SENSe]:PVTime:MASK:LSSetting</td>
</tr>
<tr>
<td>Smoothing Mode</td>
<td>[:SENSe]:PVTime:SMOothing[:STATe] OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:SMOothing[:STATe]?</td>
</tr>
<tr>
<td>Smoothing Length</td>
<td>[:SENSe]:PVTime:SMOothing:LENGth &lt;chip&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:SMOothing:LENGth?</td>
</tr>
<tr>
<td>Storage Mode</td>
<td>[:SENSe]:PVTime:AVERage[:STATe] OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:AVERage[:STATe]?</td>
</tr>
<tr>
<td>Storage Count</td>
<td>[:SENSe]:PVTime:AVERage:COUNt &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:AVERage:COUNt?</td>
</tr>
</tbody>
</table>

Table 2.8-4 lists marker settings and query commands for a marker position on the Code Domain Power vs Code Number.
### Table 2.8-4  Device Messages for Modulation Analysis Marker

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker</td>
<td>:CALCulate:EVM:CDPower:MARKer:X:MODulation?</td>
</tr>
<tr>
<td>Marker – ON/OFF</td>
<td>:CALCulate:PVT ime:MARKer[:STATe] OFF</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVT ime:MARKer[:STATe]?</td>
</tr>
<tr>
<td>Top Graph Chip Number</td>
<td>:CALCulate:PVT ime:WINDow[1]:MARKer:CHIP &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVT ime:WINDow[1]:MARKer:CHIP?</td>
</tr>
<tr>
<td>Top Graph Marker TSi</td>
<td>:CALCulate:PVT ime:WINDow[1]:MARKer:TSI?</td>
</tr>
<tr>
<td>Top Graph Marker to Transient</td>
<td>:CALCulate:PVT ime:WINDow[1]:MARKer:TRANsient</td>
</tr>
<tr>
<td>Top Graph Marker to Fail</td>
<td>:CALCulate:PVT ime:WINDow[1]:MARKer:FAIL</td>
</tr>
<tr>
<td>Bottom Graph Chip Number</td>
<td>:CALCulate:PVT ime:WINDow2:MARKer:CHIP &lt;chip&gt;</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVT ime:WINDow2:MARKer:CHIP?</td>
</tr>
<tr>
<td>Bottom Graph Marker Value</td>
<td>:CALCulate:PVT ime:WINDow2:MARKer:POWer:ABSolute?</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVT ime:WINDow2:MARKer:JUDge?</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVT ime:WINDow2:MARKer:TSI?</td>
</tr>
<tr>
<td>Peak Search</td>
<td>:CALCulate:PVT ime:WINDow2:MARKer:MAXimum</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVT ime:WINDow2:MARKer:MAXimum:NEXT</td>
</tr>
</tbody>
</table>
2.8.1 Measure

:CONFigure:PVT

Power vs Time

Function

Sets measurement mode to Power vs Time

Command

:CONFigure:PVT

Details

This command differs from the panel operation because the measurement does not start at command execution.

This command can be used when Signal Direction is set to DL.

Usage Example

To set measurement mode to Power vs Time

CONF:PVT
:INITiate:PVT
Power vs Time Initiate

Function
Starts Power vs Time

Command
:INITiate:PVT

Usage Example
To start Power vs Time
INIT:PVT

:FETCh:PVT[n]?
Power vs Time Read Fetch

Function
Queries Power vs Time results from Power vs Time display

Query
:FETCh:PVT[n]?

Response
See Table 2.8-2.

Details
−999.0 is returned when the measurement cannot be performed

This command outputs Power vs Time measurement results from the last measurement. It only outputs the measurement results and does not execute any measurement function itself. Use the READ command to execute measurement and output the result simultaneously.
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:READ:PVT[n]?
Power vs Time Read

Function
Performs Power vs Time and outputs results

Related Command
The following command operates on the same parameter.
:MEASure:PVT[n]?

:MEASure:PVT[n]?
Power vs Time Measure

Function
Performs Power vs Time and outputs results

Related Command
The following command operates on the same parameter.
:READ:PVT[n]?

2.8.2 Wide Dynamic Range
[:SENSe]:PVTime:WDRange OFF|ON|0|1
Wide Dynamic Range

Function
Set Dynamic Range ON or OFF

Command
[:SENSe]:PVTime:WDRange <switch>

Parameter

<switch>
ON|1  Wide Dynamic Range On
OFF|0  Wide Dynamic Range Off

Details
When Wide Dynamic Range is On, Pre-Amp is changed to Off.

Usage Example
To set Wide Dynamic Range to On
PVT:WDR ON
2.8 Power vs Time Function

[:SENSe]:PVTime:WDRange?
Function
Queries Wide Dynamic Range settings

Query
[:SENSe]:PVTime:WDRange?

Response
<switch>

Parameter
<switch>
0 Wide Dynamic Rang OFF
1 Wide Dynamic Rang ON

Usage Example
To query Wide Dynamic Range setting
PVT:WDR?
> 1

2.8.3 Noise Correction
[:SENSe]:PVTime:NCORrection OFF|ON|0|1
Noise Correction

Function
Sets Noise Correction ON or OFF

Command
[:SENSe]:PVTime:NCORrection <switch>

Parameter
<switch>
OFF|0 Noise Correction OFF
ON|1 Noise Correction ON

Details
This command cannot be set when Wide Dynamic Range is Off.
Also, this command cannot be set when Pre-Amp Mode is On.

Usage Example
To set Noise Correction to On:
PVT:NCOR ON
[:SENSe]:PVTime:NCORrection?
Noise Correction Query

Function
Queries Noise Correction settings

Query
[:SENSe]:PVTime:NCORrection?

Response
<switch>

Parameter
<switch>
0   Noise Correction Off
1   Noise Correction On

Usage Example
To query Noise Correction settings
PVT:NCOR?
> 1
2.8.4 Pre-Amp Mode

[:SENSe]:PVTime:PAMode OFF|ON|0|1

Pre-Amp Mode

Function

Sets Pre-Amp Mode On or Off.

When Pre-Amp Mode is On, Pre-Amp is set to On or Off at On Power or Off Power measurement, respectively.

Command

[:SENSe]:PVTime:PAMode <switch>

Parameter

<switch>

ON|1 Sets Pre-Amp Mode to On
OFF|0 Sets Pre-Amp Mode to Off

Details

Pre-Amp Mode can be set when Wide Dynamic Range is set to On and Trigger Switch is set to On.
When Wide Dynamic Range is set to Off, the Pre-Amp Mode menu is displayed in gray and this function is enabled.
Both Pre-Amp Mode and Noise Correction cannot be set to On at the same time.

When Pre-Amp Mode is On, it is required to input the trigger.

When Pre-Amp Mode is On, input the +10 dBm or less signal level.

When the Pre-Amp option (Option-008) is not installed, Pre-Amp is always set to Off, and this command is enabled.

Usage Example

To set Pre-Amp Mode to On

PVT:PAM ON
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[:SENSe]:PVTime:PAMode?
Function
Queries Pre-Amp Mode settings
Query
[:SENSe]:PVTime:WDRange?
Response
<switch>
Parameter
<switch>
0  Wide Dynamic Rang OFF
1  Wide Dynamic Rang ON
Usage Example
To query Wide Dynamic Range settings:
PVT:WDR?
> 1

2.8.5 Select Mask
[:SENSe]:PVTime:MASK:SELect STANdard|USER
Select Mask
Function
Selects Mask for judgement
Command
[:SENSe]:PVTime:MASK:SELect STANdard|USER
Parameter
<mode>
STANdard  Uses standard Mask
USER      Uses User defined Mask
Usage Example
To set User defined Mask:
PVT:MASK:SEL  USER
[:SENSe]:PVTime:MASK:SELect?
Select Mask Query

Function
Queries mask for judgement

Query
[:SENSe]:PVTime:MASK:SELect?

Response
<mode>

Parameter
<mode>
STAN Selects standard Mask
USER Selects User defined Mask

Usage Example
To query user selected Mask setting:
PVT:MASK:SEL?
> USER
2.8.6 Mask Setup - Time

[:SENSe]:PVTime:MASK:LIST:DL:TIME

<time_1>,<time_2>,<time_3>,<time_4>,<time_5>

Mask Setup - Time

Function
Sets time for User Mask

Command
[:SENSe]:PVTime:MASK:LIST:DL:TIME
<time_1>,<time_2>,<time_3>,<time_4>,<time_5>

Parameter
<time_n>
Range(n=1,2,4,5)  0.0 to 100.0
Range(n=3)  0.0 to 200.0
Resolution  0.1
Unit Chip

Usage Example
To set Mask Time to 1.0, 2.0, 3.0, 4.0, 5.0
PVT:MASK:LIST:DL:TIME 1.0,2.0,3.0,4.0,5.0

[:SENSe]:PVTime:MASK:LIST:DL:TIME?

Mask Setup - Time Query

Function
Queries Time for User Mask

Query
[:SENSe]:PVTime:MASK:LIST:DL:TIME?

Response
<time_1>,<time_2>,<time_3>,<time_4>,<time_5>

Parameter
<time_n>
Resolution  0.1
Unit Chip

Usage Example
To query Mask Time settings
PVT:MASK:LIST:DL:TIME ?
> 1.0,2.0,3.0,4.0,5.0
2.8.7 Mask Setup - Level

[:SENSe]:PVTime:MASK:LIST:DL:LI Mi t:ABSo lute <level_1>,<level_2>

**Function**
Sets Level for User Mask

**Command**
[:SENSe]:PVTime:MASK:LIST:DL:LI Mi t:ABSo lute
<level_1>,<level_2>

**Parameter**
<level_n>
- **Range**: –20.00 to –110.00
- **Resolution**: 0.01
- **Unit**: dBm

**Usage Example**
To set Mask Level from –42.0 to –82.0
PVT:MASK:LIST:DL:LI Mi t:ABSo lute -42.0,-82.0

[:SENSe]:PVTime:MASK:LIST:DL:LI Mi t:ABSo lute?

**Function**
Queries Level for User Mask

**Query**
[:SENSe]:PVTime:MASK:LIST:DL:LI Mi t:ABSo lute?

**Response**
<level_1>,<level_2>

**Parameter**
<level_n>
- **Range**: –20.0 to –110.0
- **Resolution**: 0.01
- **Unit**: dBm

**Usage Example**
To query level for User Mask
PVT:MASK:LIST:DL:LI Mi t:ABSo lute?
> -42.00,-82.00
2.8.8 Load Standard Setting

[:SENSe]:PVTime:MASK:LSSetting

Load Standard Setting

Function

Copies Standard Mask settings to User Mask

Command

[:SENSe]:PVTime:MASK:LSSetting

Usage Example

To set standard setting to User Mask
PVT:MASK:LSS

2.8.9 Smoothing Mode

[:SENSe]:PVTime:SMOoothing[:STATe] OFF|ON|0|1

Smoothing Mode

Function

Sets Smoothing On or Off.

Command

[:SENSe]:PVTime:SMOoothing[:STATe] OFF|ON|0|1

Parameter

<mode>

0|OFF Sets Smoothing to Off
1|ON: Sets Smoothing to On

Usage Example

To set Smoothing to On
PVT:SMO ON
2.8 Power vs Time Function

[:SENSe]:PVTime:SMOothing[:STATe]?

Smoothing Query

Function
Queries Smoothing settings

Query
[:SENSe]:PVTime:SMOothing[:STATe]?

Response

<mode>
0 Sets smoothing to Off
1 Sets smoothing to On

Usage Example
To query Smoothing Off
PVT:SMO?
>0

2.8.10 Smoothing Length

[:SENSe]:PVTime:SMOothing:LENGth <chip>

Smoothing Length

Function
Sets Smoothing length

Command
[:SENSe]:PVTime:SMOothing:LENGth <chip>

Parameter

<chip>
Range 0.2 to 10.0
Resolution 0.1
Initial value 1.0
Unit: chip

Usage Example
To set Smoothing length to 2.0
PVT:SMO:LENG 2.0
Chapter 2  SCPI Device Message Details

[:SENSe]:PVTime:SMOothing:LENGth?
Smoothing Length Query

Function
Queries Smoothing setting length

Query
[:SENSe]:PVTime:SMOothing:LENGth?

Response
<Chip>
Resolution  0.1
Unit  chip

Usage Example
To query Smoothing length
PVT:SMO:LENG?
> 2.0
2.8.11 Storage Mode

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

Storage Mode for Power vs Time

Function
- Sets Storage mode

Command
- [:SENSe]:PVTime:AVERage[:STATe] <mode>

Parameter
- <mode>
  - 0|OFF: Sets storage mode to Off
  - 1|ON: Sets storage mode to Average

Usage Example
- To set Storage mode to On
  - PVT:AVER ON

[:SENSe]:PVTime:AVERage[:STATe]?

Storage Mode for Power vs Time Query

Function
- Queries Storage mode settings

Query
- [:SENSe]:PVTime:AVERage[:STATe]?

Response
- <mode>
  - 0: Sets storage mode to Off
  - 1: Sets storage mode to Average

Usage Example
- To query Storage mode
  - PVT:AVER?
  - > 1
2.8.12 Storage Count

[:SENSe]:PVTtime:AVERage:COUNt <integer>
Average Count for Power vs Time

Function
Sets Storage count

Command
[:SENSe]:PVTtime:AVERage:COUNt <integer>

Parameter
<integer>
Range 2 to 999
Initial value 10
Resolution 1
Unit None

Usage Example
To set Storage count to 20
PVT:AVER:COUN 20

[:SENSe]:PVTtime:AVERage:COUNt?
Average Count for Power vs Time Query

Function
Queries Storage count

Query
[:SENSe]:PVTtime:AVERage:COUNt?

Response
<integer>
Resolution 1

Usage Example
To query Storage count
PVT:AVER:COUN?
>20
2.8.13 Marker – ON/OFF

:CALCulate:PVTime:MARKer[:STATe] OFF|ON|0|1
Marker On/Off for Power vs Time

Function

Sets Marker ON or OFF

Command

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

Parameter

<switch>
OFF|0  Marker OFF
ON|1  Marker ON

Usage Example

To display marker:
CALC:PVT:MARK ON

:CALCulate:PVTime:MARKer[:STATe]?
Marker On/Off for Power vs Time Query

Function

Queries Marker settings

Query

:CALCulate:PVTime:MARKer[:STATe]?

Response

<switch>
0  Marker OFF
1  Marker ON

Usage Example

To query marker state
CALC:PVT:MARK?
> 1
2.8.14 Top Graph Chip Number

:CALCulate:PVTIme:WINDow[1]:MARKer:CHIP <integer>

Marker Position for Top Graph

Function

Sets Top Graph Marker

Command

:CALCulate:PVTIme:WINDow[1]:MARKer:CHIP

Parameter

<integer>

Range: 0 to 6399
Resolution: 1
Unit: Chip

Usage Example

To set Top Graph Marker to 1100 chip

CALC:PVT:WIND:MARK:CHIP 1100
2.8 Power vs Time Function

:CALCulate:PVT:WINDow[1]:MARKer:CHIP?
Marker Position for Top Graph - Query

Function
Queries position for Top Graph Marker

Query
:CALCulate:PVT:WINDow[1]:MARKer:CHIP?

Response
<chip>
Resolution: 1
Unit: Chip

Usage Example
To query the position for Top Graph Marker
CALC:PVT:WIND:MARK:CHIP?
> 1100

2.8.15 Top Graph Marker TSi
:CALCulate:PVT:WINDow[1]:MARKer:TSI?
Top Graph Marker TSi

Function
Queries TSi for Top Graph Marker position

Query
:CALCulate:PVT:WINDow[1]:MARKer:TSI?

Response
<TSi>
TS0     TS0 for Top Graph Marker position
DWPT    DwPTS for Top Graph Marker position
GP      GP for Top Graph Marker position
UPPT    UpPTS for Top Graph Marker position
TS1     TS1 for Top Graph Marker position
TS2     TS2 for Top Graph Marker position
TS3     TS3 for Top Graph Marker position
TS4     TS4 for Top Graph Marker position
TS5     TS5 for Top Graph Marker position
TS6     TS6 for Top Graph Marker position

Usage Example
To query TSi for Top Graph Marker position
CALC:PVT:WIND:MARK:TSI?
> UPPT
Chapter 2  SCPI Device Message Details

2.8.16 Top Graph Marker to Transient

:CALCulate:PVTime:WINDow[1]:MARKer:TRAnsient
Top Graph Marker Position move to Transient

Function
Moves Marker to next Transient

Command
:CALCulate:PVTime:WINDow[1]:MARKer:TRAnsient

Usage Example
To move Top Graph Marker to Transient
CALC:PVT:WIND:MARK:TRAN

2.8.17 Top Graph Marker to Fail

:CALCulate:PVTime:WINDow[1]:MARKer:FAIL
Top Graph Marker Position move to Fail

Function
Moves Marker to next Fail

Command
:CALCulate:PVTime:WINDow[1]:MARKer:FAIL

Usage Example
To move Top Graph Marker to Fail
CALC:PVT:WIND:MARK:FAIL
2.8.18 Bottom Graph Chip Number

:CALCulate:PVTime:WINDow2:MARKer:CHIP <chip>

Bottom Graph Marker

Function

Sets Bottom Graph Marker position

Command

:CALCulate:PVTime:WINDow2:MARKer:CHIP <chip>

Parameter

<chip>
Range   (Top Graph Marker value –300) to (Top Graph Marker value + 299.9)
Resolution  0.1
Unit     Chip

Usage Example

To set Bottom Graph Marker position to 3600.0 chip
CALC:PVT:WIND2:MARK:CHIP 3600.0

:CALCulate:PVTime:WINDow2:MARKer:CHIP?

Bottom Graph Marker Query

Function

Queries Bottom Graph Marker position

Query

:CALCulate:PVTime:WINDow2:MARKer:CHIP?

Response

<chip>

Parameter

<chip>
Resolution  0.1
Unit     Chip

Usage Example

To query Bottom Graph Marker position
CALC:PVT:WIND2:MARK:CHIP?
> 3600.0
Chapter 2  SCPI Device Message Details

2.8.19 Bottom Graph Marker Value

:CALCulate:PVTime:WINDow2:MARKer:POWer:ABSolute?

Bottom Graph Marker Power

Function

Queries Power values for Bottom Graph Marker position

Query

:CALCulate:PVTime:WINDow2:MARKer:POWer:ABSolute?

Response

<power>

Parameter

<power>
Resolution  0.01
Unit        dBm

Usage Example

To query power values for Bottom Graph Marker position
CALC:PVT:WIND2:MARK:POW:ABS?
> -83.00

:CALCulate:PVTime:WINDow2:MARKer:JUDGe?

Bottom Graph Marker Judge

Function

Queries Pass/Fail judgement results for Bottom Graph Marker position

Query

:CALCulate:PVTime:WINDow2:MARKer:JUDGe?

Response

<judge>

Parameter

<judge>
0      Pass
1      Fail

Usage Example

To query Bottom Graph Marker JUDGe
CALC:PVT:WIND2:MARK:JUDG?
> 0
2.8 Power vs Time Function

:CALCulate:PVT:WIN:MARKer:TSI?
Bottom Graph Marker TSi

Function
Queries TSi position for Bottom Graph Marker

Query
:CALCulate:PVT:WIN:MARKer:TSI?

Response
<TSi>
TS0  TS0 for Top Graph Marker position
DWPT  DwPTS for Top Graph Marker position
GP  GP for Top Graph Marker position
UPPT  UpPTS for Top Graph Marker position
TS1  TS1 for Top Graph Marker position
TS2  TS2 for Top Graph Marker position
TS3  TS3 for Top Graph Marker position
TS4  TS4 for Top Graph Marker position
TS5  TS5 for Top Graph Marker position
TS6  TS6 for Top Graph Marker position

Usage Example
To query TSi for Bottom Graph Marker position
CALC:PVT:WIN:MARK:TSI?
> TS3
2.8.20 Peak Search

:CALCulate:PVTime:WINDow2:MARKer:MAXimum

Peek Search Function

Finds the point with the maximum difference between the Bottom Graph Mask value and measured value and moves the marker to that point.

Command

:CALCulate:PVTime:WINDow2:MARKer:MAXimum

Details

To query the measurement results after executing this command, use the *WAI command to control synchronization

Usage Example

To move the marker to the maximum level point and query the marker value

```
CALC:PVT:WIND2:MARK:MAX
*WAI
CALC:PVT:WIND2:MARK:POW:ABS?
> -83.00
```

:CALCulate:PVTime:WINDow2:MARKer:MAXimum:NEXT

Next Peak Search Function

Moves Marker to next peak

Command

:CALCulate:PVTime:WINDow2:MARKer:MAXimum:NEXT

Details

To query the measurement results after executing this command, use the *WAI command to control synchronization

Usage Example

To move Top Graph Marker to Fail:

```
CALC:PVT:WIND2:MARK:MAX:NEXT
*WAI
CALC:PVT:WIND2:MARK:POW:ABS?
> -84.00
```
Chapter 3  SCPI Status Register

This chapter explains the SCPI commands used to read the state of the application and the status register.

3.1  Reading Measurement Status ........................................ 3-2
    :STATus:ERRor? ...................................................... 3-2
    :SYSTem:ERRor? .................................................... 3-3

3.2  STATus:QUEStionable Register ..................................... 3-5
    :STATus:QUEStionable[:EVENt]? ................................ 3-7
    :STATus:QUEStionable:CONDition? .............................. 3-7
    :STATus:QUEStionable:ENABle <integer> .................... 3-8
    :STATus:QUEStionable:NTRansition <integer> ............. 3-9
    :STATus:QUEStionable:PTRansition <integer> ............. 3-10
    :STATus:QUEStionable:MEASure[:EVENt]? ................. 3-11
    :STATus:QUEStionable:MEASure:CONDition? .............. 3-11
    :STATus:QUEStionable:MEASure:ENABle <integer> .......... 3-12
    :STATus:QUEStionable:MEASure:NTRansition <integer> 3-13
    :STATus:QUEStionable:MEASure:PTRansition <integer> 3-14

3.3  STATus:OPERation Register ......................................... 3-15
    :STATus:OPERation[:EVENt]? .................................. 3-17
    :STATus:OPERation:CONDition? ................................. 3-17
    :STATus:OPERation:ENABle <integer> ....................... 3-18
    :STATus:OPERation:NTRansition <integer> ............... 3-19
    :STATus:OPERation:PTRansition <integer> ............... 3-20
3.1 Reading Measurement Status

:STATus:ERRor?
Measurement Status Error Query

Function
Queries measurement error

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: $2^0 = 1$  No measurement
bit1: $2^1 = 2$  Level Over
bit2: $2^2 = 4$  Signal Abnormal
bit3: $2^3 = 8$  (Not Used)
bit4: $2^4 = 16$  (Not Used)
bit5: $2^5 = 32$  (Not Used)
bit6: $2^6 = 64$  (Not Used)
bit7: $2^7 = 128$  (Not Used)
bit8: $2^8 = 256$  (Not Used)
bit9: $2^9 = 512$  (Not Used)
bit10: $2^{10} = 1024$  (Not Used)
bit11: $2^{11} = 2048$  (Not Used)
bit12: $2^{12} = 4096$  (Not Used)
bit13: $2^{13} = 8192$  (Not Used)
bit14: $2^{14} = 16384$  (Not Used)
bit15: $2^{15} = 32768$  (Not Used)

Range 0 to 65535

Details
0 is returned at normal termination

Usage Example
Queries measurement error
:STAT:ERR?
> 0
### SCPI Status Register

#### :SYSTem:ERRor?

**System Error Query**

**Function**  
Queries error number

**Query**  
:SYSTem:ERRor?

**Response**  
<status>

**Parameter**  
<status> Error Number

<table>
<thead>
<tr>
<th>Number</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-222</td>
<td>Out-of-range</td>
<td>The settable range is exceeded.</td>
</tr>
<tr>
<td>-221</td>
<td>Unavailable in Center Frequency Mode</td>
<td>The Carrier Frequency Mode is unavailable when the Center Frequency Mode is set and vice versa.</td>
</tr>
<tr>
<td>-221</td>
<td>Unavailable in Carrier Frequency Mode</td>
<td>The Center Frequency Mode is unavailable when the Carrier Frequency Mode is set and vice versa.</td>
</tr>
<tr>
<td>-221</td>
<td>Unavailable at Auto Detection On</td>
<td>Spreading Factor is unavailable when Auto Detection is on.</td>
</tr>
<tr>
<td>-221</td>
<td>Only available for Code Domain</td>
<td>The target time slot cannot be set to Burst when Trace Mode is set to either Multi Slot Power or Multi Carrier Power.</td>
</tr>
<tr>
<td>-221</td>
<td>Only available for Code Domain Power</td>
<td>Code Domain Power Scale can only be set when Trace Mode is set to Code Domain Power.</td>
</tr>
<tr>
<td>-221</td>
<td>Only available for Code Domain Error</td>
<td>Code Domain Error Scale can only be set when Trace Mode is set to Code Domain Error.</td>
</tr>
<tr>
<td>-221</td>
<td>Unavailable at Multi Slot Power</td>
<td>Marker Select and Marker Number are unavailable when Trace Mode is set to Multi Slot Power.</td>
</tr>
<tr>
<td>-221</td>
<td>Unavailable at Multi Carrier Power</td>
<td>Marker Select and Marker Number are unavailable when Trace Mode is set to Multi Carrier Power.</td>
</tr>
<tr>
<td>-221</td>
<td>Unavailable at Burst</td>
<td>Trace Mode cannot be set to Multi Slot Power when Target Time Slot is set to Burst.</td>
</tr>
<tr>
<td>-221</td>
<td>Unavailable at Burst</td>
<td>Trace Mode cannot be set to Multi Carrier Power when Target Time Slot is set to Burst.</td>
</tr>
<tr>
<td>-221</td>
<td>Unavailable at Bottom Graph Select</td>
<td>Constellation Marker Number is unavailable when Bottom Graph Select is set.</td>
</tr>
</tbody>
</table>
Table 3.1-1  Error Number and Description (Cont’d)

<table>
<thead>
<tr>
<th>Number</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-221</td>
<td>Unavailable at Constellation Select</td>
<td>Bottom Graph Marker Number is unavailable when Constellation Select is set.</td>
</tr>
<tr>
<td>-200</td>
<td>Load signal analyzer</td>
<td>The Signal Analyzer function must be loaded.</td>
</tr>
<tr>
<td>-200</td>
<td>Load spectrum analyzer</td>
<td>The Spectrum Analyzer function must be loaded.</td>
</tr>
<tr>
<td>-256</td>
<td>No file to read</td>
<td>There is no file to read.</td>
</tr>
<tr>
<td>-250</td>
<td>File read error</td>
<td>The file cannot be read.</td>
</tr>
<tr>
<td>-200</td>
<td>File format error</td>
<td>The file format is invalid.</td>
</tr>
</tbody>
</table>

Details
0 is returned at normal termination.

Usage Example
Reads error number
:SYST:ERR?
> 0
3.2 STATus:QUESTionable Register

The hierarchical structure of the QUESTionable Status register is described in Figures 3.2-1 and 3.2-2, and Tables 3.2-1 and 3.2-2.

### Table 3.2-1 Bit Definition of QUESTionable Status Register

<table>
<thead>
<tr>
<th>Bit</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB5</td>
<td>Reference Clock Unlock</td>
</tr>
<tr>
<td>DB9</td>
<td>QUESTionable Measure Register Summary</td>
</tr>
</tbody>
</table>

### Table 3.2-2 Bit Definition of QUESTionable Measure Register

<table>
<thead>
<tr>
<th>Bit</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB5</td>
<td>Level Over</td>
</tr>
<tr>
<td>DB8</td>
<td>Signal Abnormal</td>
</tr>
</tbody>
</table>
Table 3.2-3 lists the device messages for the QUEStionable Status register.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionable Status Register Event</td>
<td>:STATus:QUEStionable[:,:EVENT]?</td>
</tr>
<tr>
<td>Questionable Status Register Condition</td>
<td>:STATus:QUEStionable:CONDition?</td>
</tr>
<tr>
<td>Questionable Status Register Enable</td>
<td>:STATus:QUEStionable:ENABLE &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUEStionable:ENABLE?</td>
</tr>
<tr>
<td>Questionable Status Register Negative Transition</td>
<td>:STATus:QUEStionable:NTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUEStionable:NTRansition?</td>
</tr>
<tr>
<td>Questionable Status Register Positive Transition</td>
<td>:STATus:QUEStionable:PTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUEStionable:PTRansition?</td>
</tr>
<tr>
<td>Questionable Measure Register Event</td>
<td>:STATus:QUEStionable:MEASure[:,:EVENT]?</td>
</tr>
<tr>
<td>Questionable Measure Register Condition</td>
<td>:STATus:QUEStionable:MEASure:CONDition?</td>
</tr>
<tr>
<td>Questionable Measure Register Enable</td>
<td>:STATus:QUEStionable:MEASure:ENABLE &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUEStionable:MEASure:ENABLE?</td>
</tr>
<tr>
<td>Questionable Measure Register Negative Transition</td>
<td>:STATus:QUEStionable:MEASure:NTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUEStionable:MEASure:NTRansition?</td>
</tr>
<tr>
<td>Questionable Measure Register Positive Transition</td>
<td>:STATus:QUEStionable:MEASure:PTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUEStionable:MEASure:PTRansition?</td>
</tr>
</tbody>
</table>
3.2 \textit{STATus:QUEStionable Register}

:STATus:QUEStionable[:EVENt]?  
Questionable Status Register Event

Function  
Reads Event register of QUEStionable Status register

Query  
:STATus:QUEStionable[:EVENt]?

Response  
<integer>

Parameter  
<integer> Bit Sum Total of Event Register  
Resolution 1  
Range 0 to 65535

Usage Example  
Reads event register of QUEStionable Status register  
:STAT:QUES?
> 0

:STATus:QUEStionable:CONDition?  
Questionable Status Register Condition

Function  
Reads Condition register of QUEStionable Status register

Query  
:STATus:QUEStionable:CONDition?

Response  
<integer>

Parameter  
<integer> Bit Sum Total of Condition Register  
Resolution 1  
Range 0 to 65535

Usage Example  
Reads Condition register of QUEStionable Status register  
:STAT:QUES:COND?
> 0
:STATus:QUESTionable:ENABle <integer>
Questionable Status Register Enable

Function
Sets Event Enable register of QUESTionable Status register

Command
:STATus:QUESTionable:ENABle <integer>

Parameter
<integer> Bit Sum Total of Event Enable Register
Resolution 1
Range 0 to 65535

Usage Example
Sets value of Event Enable register of QUESTionable Status register to 16
:STAT:QUES:ENAB 16

:STATus:QUESTionable:ENABle?
Questionable Status Register Enable Query

Function
Reads Event Enable register of QUESTionable Status register

Query
:STATus:QUESTionable:ENABle?

Response
<integer>

Parameter
<integer> Bit Sum Total of Event Enable Register
Resolution 1
Range 0 to 65535

Usage Example
Reads Event Enable register of QUESTionable Status register
:STAT:QUES:ENAB?
> 16
3.2 \textit{STATus:QUEStionable Register}

\textbf{:STATus:QUEStionable:NTRansition} \texttt{<integer>}

Questionable Status Register Negative Transition

Function

Sets transition filter (Negative Transition) of QUEStionable Status register

Command

:STATus:QUEStionable:NTRansition \texttt{<integer>}

Parameter

\texttt{<integer>} \quad \text{Bit Sum Total of Transition Filter (Negative Transition)}

\hspace{1cm} \text{Resolution} \quad 1

\hspace{1cm} \text{Range} \quad 0 \text{ to } 65535

Usage Example

Sets transition filter (Negative Transition) of QUEStionable Status register to 16

:STAT:QUES:NTR 16

\textbf{:STATus:QUEStionable:NTRansition?}

Questionable Status Register Negative Transition Query

Function

Queries transition filter (Negative Transition) of QUEStionable Status register

Query

:STATus:QUEStionable:NTRansition?

Response

\texttt{<integer>}

Parameter

\texttt{<integer>} \quad \text{Bit Sum Total of Transition Filter (Negative Transition)}

\hspace{1cm} \text{Resolution} \quad 1

\hspace{1cm} \text{Range} \quad 0 \text{ to } 65535

Usage Example

Queries transition filter (Negative Transition) of QUEStionable Status register

:STAT:QUES:NTR?

> 16
Chapter 3  SCPI Status Register

:STATus:QUEStionable:PTRansition <integer>
Questionable Status Register Positive Transition

Function
Sets transition filter (Positive Transition) of QUEStionable Status register

Command
:STATus:QUEStionable:PTRansition <integer>

Parameter
<integer> Bit Sum Total of Transition Filter (Positive Transition)
Resolution 1
Range 0 to 65535

Usage Example
Sets transition filter (Positive Transition) of QUEStionable Status register to 16
:STAT:QUES:PTR 16

:STATus:QUEStionable:PTRansition?
Questionable Status Register Positive Transition Query

Function
Queries transition filter (Positive Transition) of QUEStionable Status register

Query
:STATus:QUEStionable:PTRansition?

Response
<integer>

Parameter
<integer> Bit Sum Total of Transition Filter (Positive Transition)
Resolution 1
Range 0 to 65535

Usage Example
Queries transition filter (Positive Transition) of QUEStionable Status register
:STAT:QUES:PTR?
> 16
3.2 \textit{STATus:QUESTionable Register}

\texttt{:STATus:QUESTionable:MEASure[:EVENt]?

Questionable Measure Register Event}

\textbf{Function} \\
Reads Event register of QUESTionable Measure register

\textbf{Query} \\
\texttt{:STATus:QUESTionable[:EVENt]?

\textbf{Response} \\
\texttt{<integer>}

\textbf{Parameter} \\
\texttt{<integer>} \\
Bit Sum Total of Event Register

Resolution 1 \hspace{1cm} Range 0 to 65535

\textbf{Usage Example} \\
Reads Event register of QUESTionable Measure register
\texttt{:STAT:QUES?} \\
\texttt{> 0}

\texttt{:STATus:QUESTionable:MEASure:CONDition?

Questionable Measure Register Condition}

\textbf{Function} \\
Reads Condition register of QUESTionable Measure register

\textbf{Query} \\
\texttt{:STATus:QUESTionable:CONDition?}

\textbf{Response} \\
\texttt{<integer>}

\textbf{Parameter} \\
\texttt{<integer>} \\
Bit Sum Total of Condition Register

Resolution 1 \hspace{1cm} Range 0 to 65535

\textbf{Usage Example} \\
Reads Condition register of QUESTionable Measure register
\texttt{:STAT:QUES:COND?} \\
\texttt{> 0}
Chapter 3  SCPI Status Register

:STATus:QUEStionable:MEASure:ENABle <integer>
Questionable Measure Register Enable

Function
Sets Event Enable register of QUEStionable Measure register

Command
:STATus:QUEStionable:ENABle <integer>

Parameter
<integer> Bit Sum Total of Event Enable Register
Resolution 1
Range 0 to 65535

Usage Example
Sets value of Event Enable register of QUEStionable Measure register to 16
:STAT:QUES:ENAB 16

:STATus:QUEStionable:MEASure:ENABle?
Questionable Measure Register Enable Query

Function
Reads Event Enable register of QUEStionable Measure register

Query
:STATus:QUEStionable:ENABle?

Response
<integer>

Parameter
<integer> Bit Sum Total of Event Enable Register
Resolution 1
Range 0 to 65535

Usage Example
Reads Event Enable register of QUEStionable Measure register
:STAT:QUES:ENAB?
> 16
### :STATus:QUESTionable:MEASure:NTRansition <integer>

**Questionable Measure Register Negative Transition**

**Function**
Sets transition filter (Negative Transition) of QUEStionable Measure register

**Command**
:STATus:QUESTionable:NTRansition <integer>

**Parameter**
<integer> Bit Sum Total of Transition Filter (Negative Transition)

Resolution  1  
Range 0 to 65535

**Usage Example**
Sets transition filter (Negative Transition) of QUEStionable Measure register to 16
:STAT:QUES:NTR 16

### :STATus:QUESTionable:MEASure:NTRansition?

**Questionable Measure Register Negative Transition Query**

**Function**
Queries transition filter (Negative Transition) of QUEStionable Measure register

**Query**
:STATus:QUESTionable:NTRansition?

**Response**
<integer>

**Parameter**
<integer> Bit Sum Total of Transition Filter (Negative Transition)

Resolution  1  
Range 0 to 65535

**Usage Example**
Queries transition filter (Negative Transition) of QUEStionable Measure register
:STAT:QUES:NTR?
> 16
:STATus:QUESTionable:MEASure:PTRansition <integer>
Questionable Measure Register Positive Transition

Function
Sets transition filter (Positive Transition) of QUEStionable Measure register

Command
:STATus:QUESTionable:PTRansition <integer>

Parameter
<integer> Bit Sum Total of Transition Filter (Positive Transition)
Resolution 1
Range 0 to 65535

Usage Example
Sets transition filter (Positive Transition) of QUEStionable Measure register to 16
:STAT:QUES:PTR 16

:STATus:QUESTionable:MEASure:PTRansition?
Questionable Measure Register Positive Transition Query

Function
Queries transition filter (Positive Transition) of QUEStionable Measure register

Query
:STATus:QUESTionable:PTRansition?

Response
<integer>

Parameter
<integer> Bit Sum Total of Transition Filter (Positive Transition)
Resolution 1
Range 0 to 65535

Usage Example
Queries transition filter (Positive Transition) of QUEStionable Measure register
:STAT:QUES:PTR?
> 16
3.3 STATus:OPERation Register

The hierarchical structure of the OPERation Status register is described in Figure 3.3-1 and Table 3.3-1.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB0</td>
<td>CAL Executed</td>
</tr>
<tr>
<td>DB1</td>
<td>Warm-up displayed</td>
</tr>
<tr>
<td>DB4</td>
<td>Capture executed (Always 1 at Continuous measurement)</td>
</tr>
<tr>
<td>DB5</td>
<td>Waiting for trigger signal</td>
</tr>
<tr>
<td>DB8</td>
<td>Operating on file</td>
</tr>
</tbody>
</table>
Table 3.3-2 lists the device messages for the OPERation status register.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Status Register Event</td>
<td>:STATus:OPERation[:EVENt]?</td>
</tr>
<tr>
<td>Operation Status Register Condition</td>
<td>:STATus:OPERation:CONDition?</td>
</tr>
<tr>
<td>Operation Status Register Enable</td>
<td>:STATus:OPERation:ENABLE &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:OPERation:ENABLE?</td>
</tr>
<tr>
<td>Operation Status Register Negative Transition</td>
<td>:STATus:OPERation:NTRTransition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:OPERation:NTRTransition?</td>
</tr>
<tr>
<td>Operation Status Register Positive Transition</td>
<td>:STATus:OPERation:PTRTransition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:OPERation:PTRTransition?</td>
</tr>
</tbody>
</table>
3.3 **STATus:OPERation Register**

:STATus:OPERation[:EVENt]?

Operation Status Register Event

**Function**

Reads Event register of OPERation Status register

**Query**

:STATus:OPERation[:EVENt]?

**Response**

<integer>

**Parameter**

<integer> Bit Sum Total of Event Register

Resolution 1
Range 0 to 65535

**Usage Example**

Reads Event register of OPERation Status register

:STAT:OPER?

> 0

:STATus:OPERation:CONDition?

Operation Status Register Condition

**Function**

Reads Event register of OPERation Condition register

**Query**

:STATus:OPERation:CONDition?

**Response**

<integer>

**Parameter**

<integer> Bit Sum Total of Condition Register

Resolution 1
Range 0 to 65535

**Usage Example**

Reads Event register of OPERation Condition register

:STAT:OPER:COND?

> 0
Chapter 3  SCPI Status Register

:STATus:OPERation:ENABle <integer>
Operation Status Register Enable

Function
Sets Event Enable register of OPERation Status register

Command
:STATus:OPERation:ENABle <integer>

Parameter
<integer>  Bit Sum Total of Event Enable Register
Resolution  1
Range      0 to 65535

Usage Example
Sets Event Enable register of OPERation Status register to 16
:STAT:OPER:ENAB 16

:STATus:OPERation:ENABle?
Operation Status Register Enable Query

Function
Reads Event Enable register of OPERation Status register

Query
:STATus:OPERation:ENABle?

Response
<integer>

Parameter
<integer>  Bit Sum Total of Event Enable Register
Resolution  1
Range      0 to 65535

Usage Example
Reads Event Enable register of OPERation Status register
:STAT:OPER:ENAB?
> 16
3.3 STATus:OPERation Register

:STATus:OPERation:NTRansition <integer>
Operation Status Register Negative Transition

Function
Sets transition filter (Negative Transition) of OPERation Status register

Command
:STATus:OPERation:NTRansition <integer>

Parameter
<integer> Bit Sum Total of Transition Filter (Negative Transition)
Resolution 1
Range 0 to 65535

Usage Example
Sets transition filter (Negative Transition) of OPERation Status register to 16
:STAT:OPER:NTR 16

:STATus:OPERation:NTRansition?
Operation Status Register Negative Transition Query

Function
Reads transition filter (Negative Transition) of OPERation Status register

Query
:STATus:OPERation:NTRansition?

Response
<integer>

Parameter
<integer> Bit Sum Total of Transition Filter (Negative Transition)
Resolution 1
Range 0 to 65535

Usage Example
Reads transition filter (Negative Transition) of OPERation Status register
:STAT:OPER:NTR?
> 16
Chapter 3  SCPI Status Register

:STATus:OPERation:PTRansition <integer>
Operation Status Register Positive Transition

Function
Sets transition filter (Positive Transition) of OPERation Status register

Command
:STATus:OPERation:PTRansition <integer>

Parameter
<integer>  Bit Sum Total of Transition Filter (Positive Transition)  
Resolution  1  
Range  0 to 65535

Usage Example
Sets transition filter (Positive Transition) of OPERation Status register to 16
:STAT:OPER:PTR 16

:STATus:OPERation:PTRansition?
Operation Status Register Positive Transition Query

Function
Reads transition filter (Positive Transition) of OPERation Status register

Query
:STATus:OPERation:PTRansition?

Response
<integer>

Parameter
<integer>  Bit Sum Total of Transition Filter (Positive Transition)  
Resolution  1  
Range  0 to 65535

Usage Example
Reads transition filter (Positive Transition) of OPERation Status register
:STAT:OPER:PTR?
> 16