

**MX283087A
TRX Sweep Calibration
Operation Manual
Remote Control**

Second Edition

- For safety and warning information, please read this manual before attempting to use the equipment.
- Additional safety and warning information is provided within the MS2830A Signal Analyzer Operation Manual (Mainframe operation) and MX283087A TRX Sweep Calibration Operation Manual (Operation). Please also refer to these documents before using the equipment.
- Keep this manual with the equipment.

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Symbols used in manual



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



CAUTION

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Safety Symbols Used on Equipment and in Manual

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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.

MX283087A
TRX Sweep Calibration
Operation Manual Remote Control

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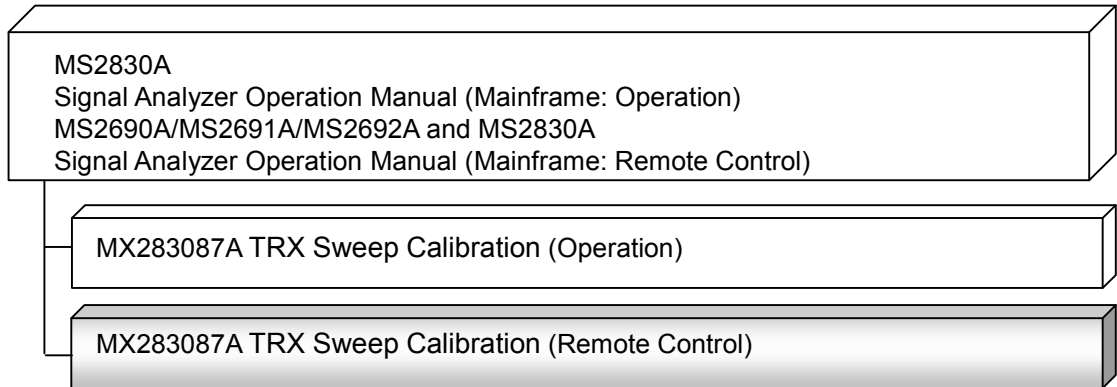
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About This Manual

■ About this document

This operation manual is for MX283087A TRX Sweep Calibration (Remote Control).



- Mainframe: Operation
- Mainframe: Remote Control

These describe basic operations, maintenance procedures, common functions and common remote functions of the signal analyzer.

- MX283087A TRX Sweep Calibration Operation Manual (Operation)

This document describes the operation of MX283087A TRX Sweep Calibration.

- MX283087A TRX Sweep Calibration Operation Manual (Remote Control: This document)

This document describes the remote control of MX283087A TRX Sweep Calibration Operation Manual.

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Appendix

Chapter 1 Overview

This chapter outlines the remote control operation of the MX283087A TRX Sweep Calibration (hereinafter referred to as “MX283087A”).


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1.1 Product Overview

The MX283087A can be controlled from an external controller (PC) by remote control commands using the MS2830A Signal Analyzer (hereafter referred to as “this instrument”). The remote control commands are defined using the SCPI format and original format.

1.1.1 Interface

This instrument has GPIB, Ethernet, and USB interfaces for remote control. Only one of these can be used at once.

The interface is automatically determined when a command is received at the start of communication. This instrument enters the remote state after the interface has been determined.  on the front panel goes off in Local status and lights up in Remote status.

Refer to the *MS2830A Signal Analyzer manual (Mainframe, Remote Control)* for more details of the basic operations for remote control, such as interface setting.

1.1.2 Controlled Application

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

In this instrument, multiple applications can be loaded at the same time. Only one application resource can be executed per piece of hardware at one time. The MX283087A measures by using the resource of RF Input/Output. Thus, the MX283087A cannot be executed at the same time with another application using the same resource such as the signal analyzer function. In order to execute a function unique to the application by using the remote control, you need to select this application while it has been running. Unlike other applications, the MX283087A uses the resources of the MS2830A Option 020/021 Vector Signal Generator (hereafter “Option 020”). Note that the MX283087A and Option 020 cannot be used at the same time.

1.2 Basic Flow of Control

This section describes the basic remote control command programming operations for measuring signals.

Figure 1.2-1 shows the flow of the basic control process.

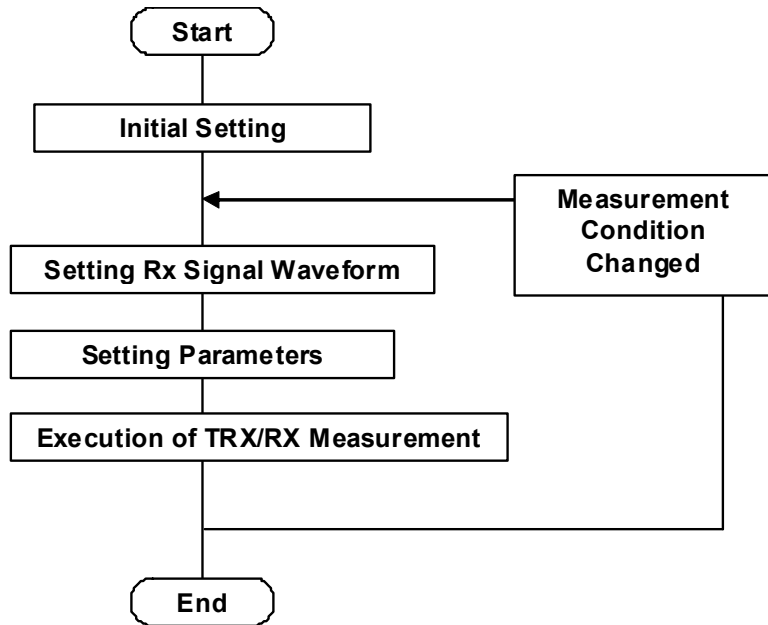


Figure 1.2-1 Basic Flow of Control

(1) Initial Setting

Initialize the communication interface and the parameters, set the communication mode, load applications, and select applications.

 1.2.1 Default Setting

(2) Setting Rx Signal Waveform

Set signal waveform pattern for Rx test.

 1.2.2 Setting Rx Signal Waveform


(3) Setting Parameters

Specify parameters applied to the TRX/RX measurement, such as the measurement mode, measurement frequency list, and measurement frequency level.

 1.2.3 Setting Parameters

(4) Execution of TRX/RX Measurement

Execute measurement end processing.

 1.2.4 Measuring

1.2.1 Default Setting

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

- (1) Initializing Communication Interface
The remote control interface to be used is initialized so sending and receiving of commands can start. Refer to the operation manual of the interface used, for details about the remote control interface.
- (2) Setting Language Mode and Response Format
The language mode and the response format used to communicate are set. Refer to *MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer manual (Mainframe Remote Control)* for details.
- (3) Starting the application
The application is loaded.
- (4) Selecting Application
The target application is selected.
- (5) Initialization
All parameters and statuses are reset at initialization.

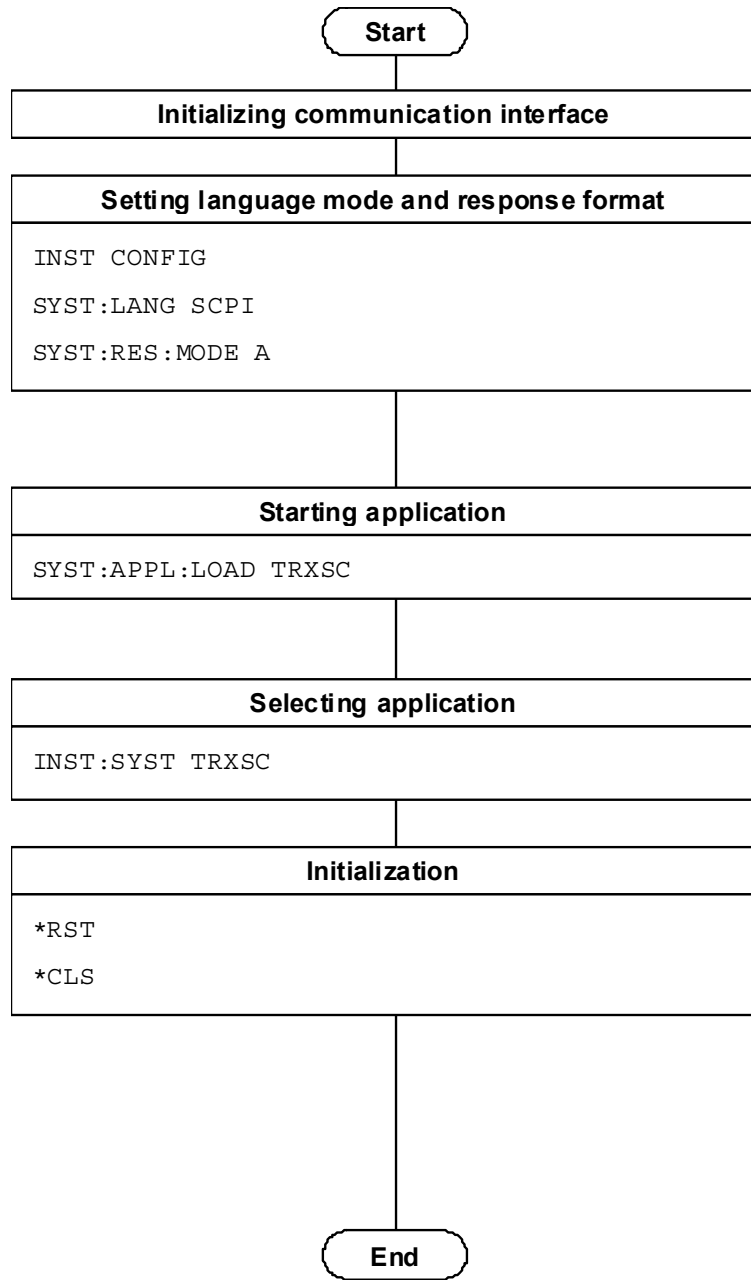


Figure 1.2.1-1 Initialization Flow and Command Example

1.2.2 Setting Rx Signal Waveform

Set up the waveform pattern of the Rx test signal. The waveform pattern set up by the Signal Generator application is used as this pattern. Switch to this application to set up the waveform pattern. For details of the control of Signal Generator, refer to *MS2830A Signal Analyzer Vector Signal Generator Operation Manual Remote Control*.

- (1) Switching the Application
Switch to the Signal Generator application.
- (2) Setting Rx Signal Waveform
Set up the waveform pattern of the Rx signal. This setup can be omitted if an unmodulated wave is used as the Rx signal.
- (3) Enabling or Disabling the Modulation Function
Enable (turn on) or disable (turn off) modulation.
- (4) Switching the Application
Switch the MX283087A application.

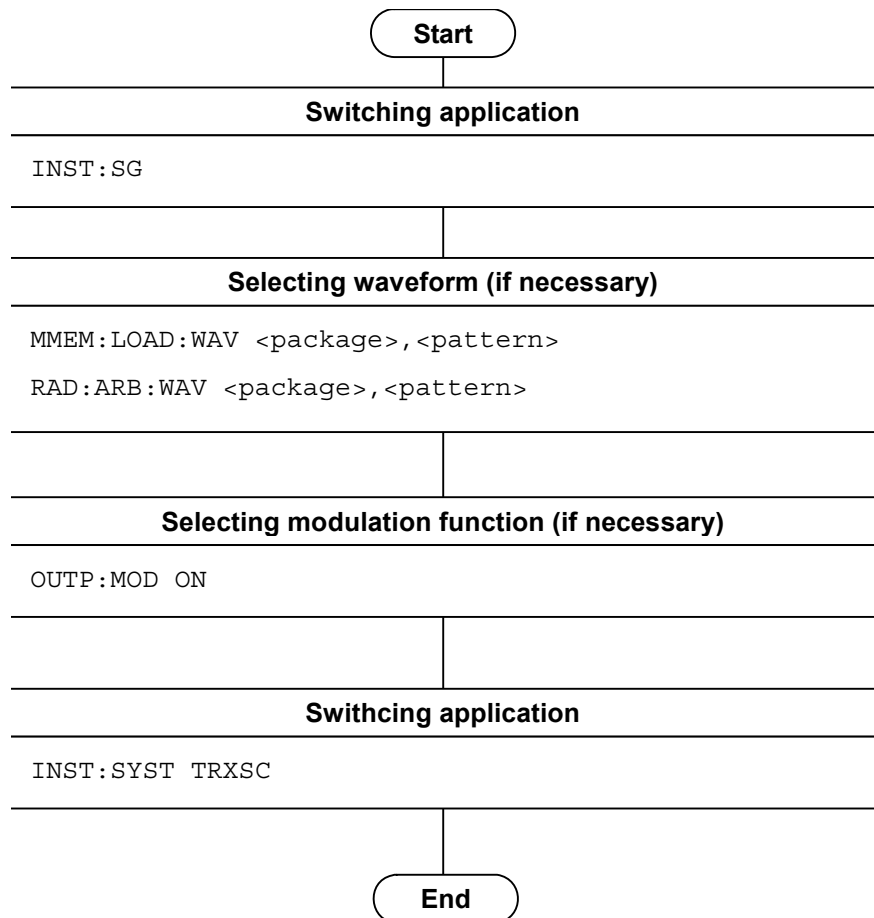


Figure 1.2.2-1 Rx Signal Waveform Setup Flow and Command Example

1.2.3 Setting Parameters

Specify the measurement mode, common parameters, TX parameters, RX parameters, and other parameters as required.

The parameters can be set in any order, unless otherwise specified.

- (1) Measurement mode
- (2) Common parameters
 - Number of sequences
 - Number of segments
 - Segment length
- (3) TX parameters
 - Measurement ratio
 - Trigger on/off
 - Trigger timeout
 - Trigger level
 - Analysis bandwidth
 - Filter
 - Frequency list
 - Level list
- (4) RX parameters
 - Frequency list
 - Level list
- (5) RX trigger sequence parameters
 - Number of short burst segments
 - Number of time offset segments
 - Short burst level

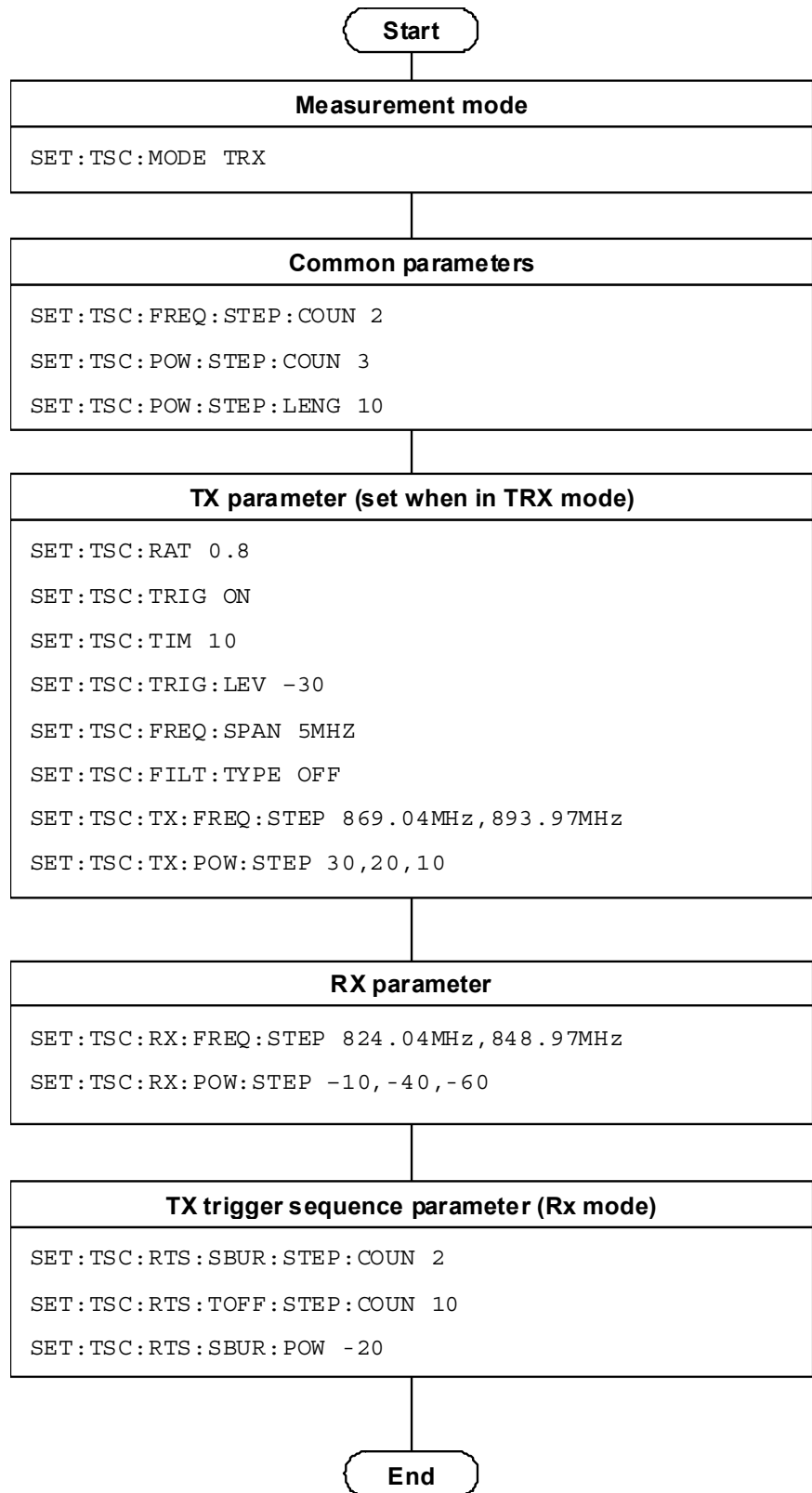


Figure 1.2.3-1 Parameter Setup Flow and Command Example

1.2.4 Measuring

Perform measurement according to the specified settings in each measurement mode.

■ TRx measurement mode

- (1) Starting Measurement
Start TRx measurement and wait for a trigger signal.
- (2) Checking Trigger Wait State
Make sure that the MX283087A can receive a trigger signal.
Next, start test signal output from the DUT.
- (3) Reading Measurement Results

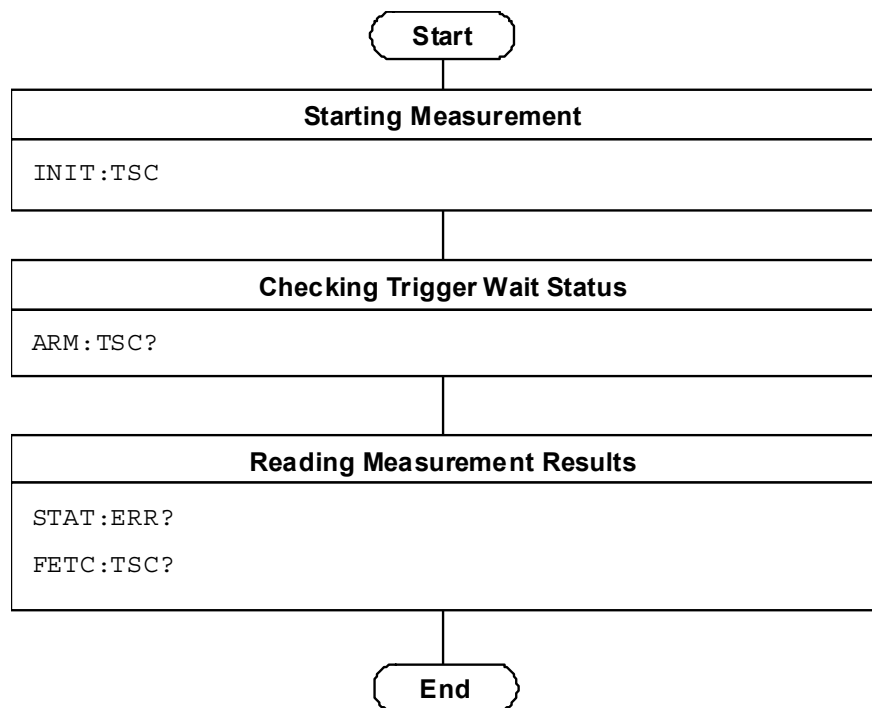


Figure 1.2.4-1 Measurement Flow (TRX Measurement Mode) and Command Example

■ Rx measurement mode

- (1) Starting Measurement
Start Rx signal transmission.
- (2) Ending Measurement
Make sure that Rx signal transmission has finished.

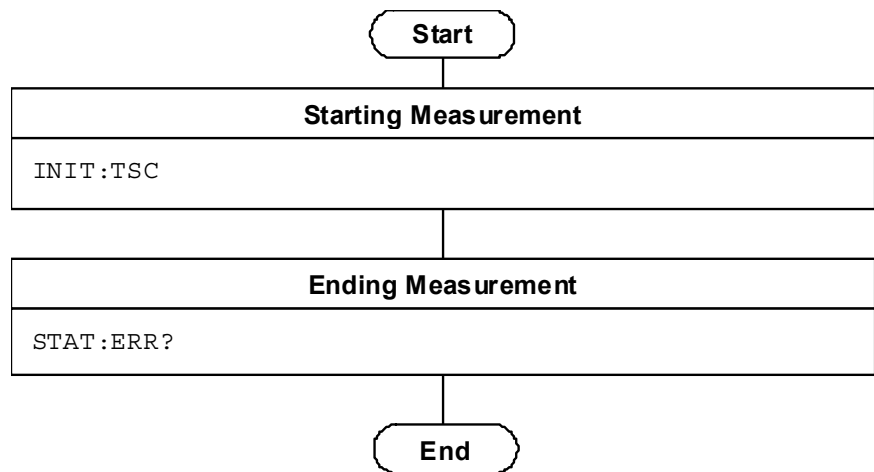


Figure 1.2.4-2 Measurement Flow (RX Measurement Mode) and Command Example

1.3 Native Mode

This instrument defines the syntax/format types of the remote control commands as “Language mode”. The language mode has two modes: SCPI and Native.

(1) SCPI mode

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

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

(2) Native mode

The Native mode processes commands that are in this instrument’s own definition type. Unless otherwise specified, the character string of a command header is fixed. If application commands are defined only by the SCPI mode, character strings converted according to the conversion rules are the commands in the Native mode.

Note:

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

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

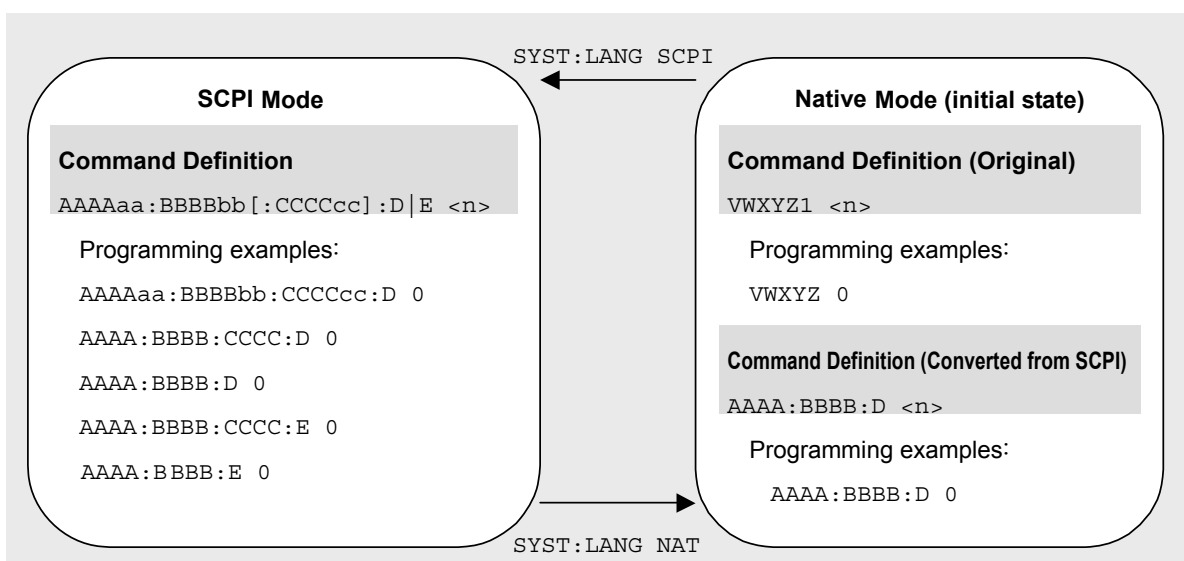


Figure 1.3-1 SCPI Mode and Native Mode

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

The below 1 to 5 indicates the conversion rules.

Conversion Rules

1. Move the numeric parameters in the SCPI mode program header to the head of the arguments. Omit a numeric parameter, which only has one value.
2. Use the first node if multiple ones can be selected.
3. Delete layers that can be deleted.
4. Alter all the long forms into the short ones.
5. Omit the colon (":") at the head of the command.

Example 1

To convert `:CALCulate:MARKer [1] | 2 [:SET] :CENTer` into a Native mode command.

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

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

↓

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

(A numeric value (1 or 2) is put <integer>.)

2. Delete layers that can be deleted.

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

↓

```
:CALCulate:MARKer:CENTer <integer>
```

3. Alter all the long forms into the short ones.

```
:CALCulate:MARKer:CENTER <integer>
```

↓

```
:CALC:MARK:CENT <integer>
```

4. Omit the colon (":") at the head of the command.

```
:CALC:MARK:CENT <integer>
```

↓

```
CALC:MARK:CENT <integer>
```

1.4 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

After DEFault has been set to numeric program data, the target parameter is set to the default value.

(2) MINimum

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

(3) MAXimum

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

In the MX283087A, DEFault, MINimum, and MAXimum can be used for the following parameters.

<numeric_value>

<integer>

Chapter 2 SCPI Device Message Details

This chapter describes the detailed specifications of SCPI remote control commands for executing the functions of the MX 283087A. The device messages are listed according to function. Refer to the *MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe Remote Control)* for detailed specifications of the IEEE488.2 common device messages and application common device messages.

2.1	Config Function Device Messages.....	2-3
	:SYSTem:APPLication:LOAD <apl_name>	2-4
	:SYSTem:APPLication:UNLoad <apl_name>	2-5
	:SYSTem:APPLication:VERSion? <apl_name>	2-5
2.2	Application Common Device Messages.....	2-6
	:INSTrument[:SELEct] SIGANA SPECT SG CONFIg TRXSC	2-8
	:INSTrument[:SELEct]?	2-9
	:INSTrument:SYSTem SIGANA SPECT SG CONFIg TRXSC,[ACTive] INACTive MINimum .	2-10
	:INSTrument:SYSTem?	2-11
	:SETup:TSCalibration:TX:POWer:STEP[:LEVels]	
	<pow_1>,<pow_2>,<pow_3>,<pow_4>,<pow_5>,<pow_6>,<pow_7>,<pow_8>,<pow_9>,<pow_10>,<pow_11>,<pow_12>,<pow_13>,<pow_14>,<pow_15>,<pow_16>,<pow_17>,<pow_18>,<pow_19>,<pow_20>,<pow_21>,<pow_22>,<pow_23>,<pow_24>,<pow_25>,<pow_26>,<pow_27>,<pow_28>,<pow_29>,<pow_30>,<pow_31>,<pow_32>,<pow_33>,<pow_34>,<pow_35>,<pow_36>,<pow_37>,<pow_38>,<pow_39>,<pow_40> , ,<pow_80>	2-12
	:SETup:TSCalibration:TX:POWer:STEP[:LEVels]?	2-13
	:SETup:TSCalibration:RX:POWer:STEP[:LEVels]	
	<pow_1>,<pow_2>,<pow_3>,<pow_4>,<pow_5>,<pow_6>,<pow_7>,<pow_8>,<pow_9>,<pow_10>,<pow_11>,<pow_12>,<pow_13>,<pow_14>,<pow_15>,<pow_16>,<pow_17>,<pow_18>,<pow_19>,<pow_20>,<pow_21>,<pow_22>,<pow_23>,<pow_24>,<pow_25>,<pow_26>,<pow_27>,<pow_28>,<pow_29>,<pow_30>,<pow_31>,<pow_32>,<pow_33>,<pow_34>,<pow_35>,<pow_36>,<pow_37>,<pow_38>,<pow_39>,<pow_40> , ,<pow_80>	2-14
	:SETup:TSCalibration:RX:POWer:STEP[:LEVels]?	2-15
	:SETup:TSCalibration:RX:POWer:OFFSet:STATe ON OFF 1 0.....	2-16
	:SETup:TSCalibration:RX:POWer:OFFSet:STATe?	2-16
	:SETup:TSCalibration:RX:POWer:OFFSet	
	<offset1>,<offset2>,<offset3>,<offset4>,<offset5>,<offset6>,<offset7>,<offset8>,<offset9>,<offset10>,<offset11>,<offset12>,<offset13>,<offset14>,<offset15>,<offset16>,<offset17>,<offset18>,<offset19>,<offset20>	2-17
	:SETup:TSCalibration:RX:POWer:OFFSet?.....	2-18
	:SETup:TSCalibration:RX:POWer:OFFSet:ERRor?.....	2-19
	:SETup:TSCalibration:TX:FREQuency:STEP[:VALues]	
	<freq_1>,<freq_2>,<freq_3>,<freq_4>,<freq_5>,<freq_6>,<freq_7>,<freq_8>,<freq_9>,<freq_10>,<freq_11>,<freq_12>,<freq_13>,<freq_14>,<freq_15>,<freq_16>,<freq_17>,<freq_18>,<freq_19>,<freq_20>	2-20

<freq_9>,<freq_10>,<freq_11>,<freq_12>,<freq_13>,<freq_14>,<freq_15>, <freq_16>,<freq_17>,<freq_18>,<freq_19>,<freq_20>.....	2-20
:SETup:TSCalibration:TX:FREQUency:STEP[:VALues]?	2-21
:SETup:TSCalibration:RX:FREQUency:STEP[:VALues] <freq_1>,<freq_2>,<freq_3>,<freq_4>,<freq_5>,<freq_6>,<freq_7>,<freq_8>, <freq_9>,<freq_10>,<freq_11>,<freq_12>,<freq_13>,<freq_14>,<freq_15>, <freq_16>,<freq_17>,<freq_18>,<freq_19>,<freq_20>.....	2-22
:SETup:TSCalibration:RX:FREQUency:STEP[:VALues]?	2-23
:SETup:TSCalibration:POWer:STEP:COUNT <integer>.....	2-24
:SETup:TSCalibration:POWer:STEP:COUNT?	2-24
:SETup:TSCalibration:POWer:STEP:LENGth <integer>.....	2-25
:SETup:TSCalibration:POWer:STEP:LENGth?.....	2-25
:SETup:TSCalibration:FREQUency:STEP:COUNT <integer>.....	2-26
:SETup:TSCalibration:FREQUency:STEP:COUNT?	2-26
:SETup:TSCalibration:TIMEout <integer>.....	2-27
:SETup:TSCalibration:TIMEout?	2-28
:SETup:TSCalibration:RATio <real>.....	2-29
:SETup:TSCalibration:RATio?	2-30
:SETup:TSCalibration:OFFSet <real>.....	2-31
:SETup:TSCalibration:OFFSet?	2-32
:SETup:TSCalibration:MODE TRX RX.....	2-33
:SETup:TSCalibration:MODE?	2-33
:SETup:TSCalibration:RTSequence:SBURst:STEP:COUNT <integer>.....	2-34
:SETup:TSCalibration:RTSequence:SBURst:STEP:COUNT?	2-34
:SETup:TSCalibration:RTSequence:TOFFset:STEP:COUNT <integer>.....	2-35
:SETup:TSCalibration:RTSequence:TOFFset:STEP:COUNT?.....	2-35
:SETup:TSCalibration:RTSequence:SBURst:POWer <pow>.....	2-36
:SETup:TSCalibration:RTSequence:SBURst:POWer?	2-36
:INITiate[:IMMEDIATE].....	2-37
:INITiate:TSCalibration.....	2-37
:ARM:TSCalibration?	2-38
:FETCh:TSCalibration[1]?.....	2-39
:SETup:TSCalibration:FREQUency:SPAN <freq>.....	2-40
:SETup:TSCalibration:FREQUency:SPAN?.....	2-40
:SETup:TSCalibration:FILTer:TYPE OFF RNYQuist.....	2-41
:SETup:TSCalibration:FILTer:TYPE?	2-41
:SETup:TSCalibration:TRIGger[:STATe] ON OFF 1 0	2-42
:SETup:TSCalibration:TRIGger[:STATe]?	2-43
:SETup:TSCalibration:TRIGger:LEVel <level>.....	2-43
:SETup:TSCalibration:TRIGger:LEVel?.....	2-44

2.1 Config Function Device Messages

Config Function device messages available in this application are shown in Table 2.1-1.

Table 2.1-1 Config Function Device Messages

Function	Device Messages
Load Application	:SYSTem:APPLication:LOAD <apl_name>
Unload Application	:SYSTem:APPLication:UNLoad <apl_name>
Software Version Query	:SYSTem:APPLication:VERSion? <apl_name>

:SYSTem:APPLication:LOAD <apl_name>

Load Application

Function

This command loads an application.

Command

:SYSTem:APPLication:LOAD <apl_name>

Parameter

<apl_name>	Target application name
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
SG	Signal Generator
TRXSC	TRX Sweep Calibration

Detail

This function loads an installed application and registers it to the Application Switch menu.

For parameters to specify an application other than the standard ones, refer to the operation manual (remote control) for each application.

Example of Use

To load the Signal Analyzer application.
SYST:APPL:LOAD SIGANA

:SYSTem:APPLication:UNLoad <apl_name>

Unload Application

Function

This command exits an application.

Command

`:SYSTem:APPLication:UNLoad <apl_name>`

Parameter

<code><apl_name></code>	Target application name
<code>SIGANA</code>	Signal Analyzer
<code>SPECT</code>	Spectrum Analyzer
<code>SG</code>	Signal Generator
<code>TRXSC</code>	TRX Sweep Calibration

Detail

This function exits the active application and deletes it from the Application Switch menu.

For parameters to specify an application other than the standard ones, refer to the operation manual (remote control) for each application

Example of Use

To exit the Signal Analyzer application.
`SYST:APPL:UNL SIGANA`

:SYSTem:APPLication:VERsion? <apl_name>

Software Version Query

Function

This command queries the application version.

Query

`:SYSTem:APPLication:VERsion? <apl_name>`

Response

`version`

Parameter

<code><apl_name></code>	Target application name
<code>SIGANA</code>	Signal Analyzer
<code>SPECT</code>	Spectrum Analyzer
<code>PNOISE</code>	Phase Noise
<code>TRXSC</code>	TRX Sweep Calibration

Example of Use

To query the version of the Signal Analyzer application.
`SYST:APPL:VERS? SIGANA`

2.2 Application Common Device Messages

Application common device messages available in this application are shown in Table 2.2-1.

Table 2.2-1 Application Common Device Messages

Function	Device Messages
Application Switch	:INSTrument [:SElect] SIGANA SPECT SG CONFIG TRXSC
	:INSTrument [:SElect] ?
Application Status	:INSTrument:SYSTem SIGANA SPECT SG CONFIG TRXSC, [ACTive] INACTive MINimum
	:INSTrument:SYSTem?
Edit Segment Tx Power Levels	:SETup:TSCalibration:TX:POWer:STEP[:LEVelS] <pow_n>
	:SETup:TSCalibration:TX:POWer:STEP[:LEVelS] ?
Edit Segment DUT Rx Power	:SETup:TSCalibration:RX:POWer:STEP[:LEVelS] <pow_n>
	:SETup:TSCalibration:RX:POWer:STEP[:LEVelS] ?
RX Level Offset	:SETup:TSCalibration:RX:POWer:OFFSet:STATe ON OFF 1 0
	:SETup:TSCalibration:RX:POWer:OFFSet:STATe?
RX Level Offset Value	:SETup:TSCalibration:RX:POWer:OFFSet <offset_n>
	:SETup:TSCalibration:RX:POWer:OFFSet?
RX Level Unleveled State	:SETup:TSCalibration:RX:POWer:OFFSet:ERRor? <integrity_indicator>, <sequence>, <segment>
Edit Sequence DUT Tx Frequency	:SETup:TSCalibration:TX:FREQuency:STEP[:VALues]
	:SETup:TSCalibration:TX:FREQuency:STEP[:VALues] ?
Edit Sequence DUT Rx Frequency	:SETup:TSCalibration:RX:FREQuency:STEP[:VALues] <freq_n>
	:SETup:TSCalibration:RX:FREQuency:STEP[:VALues] ?
Segment DUT Tx Power Count	:SETup:TSCalibration:POWer:STEP:COUNT <integer>
	:SETup:TSCalibration:POWer:STEP:COUNT?
Segment DUT Tx Power Step Time	:SETup:TSCalibration:POWer:STEP:LENGth <integer>
	:SETup:TSCalibration:POWer:STEP:LENGth?
Sequence Frequency Count	:SETup:TSCalibration:FREQuency:STEP:COUNT <integer>
	:SETup:TSCalibration:FREQuency:STEP:COUNT?
Measure TRX Sweep Calibration Timeout	:SETup:TSCalibration:TIMEout <integer>
	:SETup:TSCalibration:TIMEout?
Measure TRX Sweep Calibration Ratio	:SETup:TSCalibration:RATio <real>
	:SETup:TSCalibration:RATio?

Table 2.2-1 Application Common Device Messages (Cont'd)

Function	Device Messages
TRX Sweep Calibration Time Offset	:SETup:TSCalibration:OFFSet <real>
	:SETup:TSCalibration:OFFSet?
TRX Sweep Calibration Mode Select	:SETup:TSCalibration:MODE TRX RX
	:SETup:TSCalibration:MODE?
Short Burst Segment Count	:SETup:TSCalibration:RTSequence:SBURst:STEP:COUNT <integer>
	:SETup:TSCalibration:RTSequence:SBURst:STEP:COUNT?
Time Offset Segment Count	:SETup:TSCalibration:RTSequence:TOffSet:STEP:COUNT <integer>
	:SETup:TSCalibration:RTSequence:TOffSet:STEP:COUNT?
Short Burst Level	:SETup:TSCalibration:RTSequence:SBURst:POWer <pow>
	:SETup:TSCalibration:RTSequence:SBURst:POWer?
Initiate	:INITiate[:IMMediate]
TRX Sweep Calibration Initiate	:INITiate:TSCalibration
TRX Sweep Calibration Arm Query	:ARM:TSCalibration?
TRX Sweep Calibration Fetch to Read TX Power Results	:FETCh:TSCalibration[1]?
Span Frequency	:SETup:TSCalibration:FREQuency:SPAN <freq>
	:SETup:TSCalibration:FREQuency:SPAN?
TRX Sweep Calibration Filter Type	:SETup:TSCalibration:FILTer:TYPE OFF RNYQuist
	:SETup:TSCalibration:FILTer:TYPE?
TRX Sweep Calibration Trigger Switch	:SETup:TSCalibration:TRIGger[:STATe] ON OFF 1 0
	:SETup:TSCalibration:TRIGger[:STATe]?
TRX Sweep Calibration Trigger Level	:SETup:TSCalibration:TRIGger:LEVel <level>
	:SETup:TSCalibration:TRIGger:LEVel?

:INSTrument[:SElect] SIGANA|SPECT|SG|CONFIG|TRXSC

Application Switch

Function

This command switches the target application for operation/control.

Command

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

Parameter

<apl_name>	Target application name
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
SG	Signal Generator
CONFIG	Config
TRXSC	TRX Sweep Calibration

Details

This function is used to switch the operation/control target application. An application whose status is CURRENT is a remote control target.

Example of Use

To switch the operation target application to the Signal Analyzer.
INST SIGANA

:INSTrument[:SElect]?

Application Switch Query

Function

This command queries the reading for the target application for operation/control.

Query

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

Response

```
<apl_name>
```

Parameter

<apl_name>	Target application name
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
SG	Signal Generator
CONFIG	Config
TRXSC	TRX Sweep Calibration

Details

This function is used to switch the operation/control target application. An application whose status is `CURRENT` is a remote control target.

Example of Use

```
To query the operation target application.
INST?
> TRXSC
```

:INSTrument:SYSTem

SIGANA|SPECT|SG|CONFIg|TRXSC,[ACTive]|INACTive|MINimum

Application Status

Function

This command sets the status of the application.

Command

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

Parameter

<code><apl_name></code>	Target application name
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
SG	Signal Generator
CONFIg	Config
TRXSC	TRX Sweep Calibration
<code><window></code>	Application window status
ACTive	Operation enabled (displayed on top screen)
INACTive	Inactive
MINimum	Minimized
When omitted	Same as ACT

Details

This function is used to switch the operation/control target application.

Example of Use

To switch the window status of the Spectrum Analyzer to Active.

`INST:SYST SPECT,ACT`

:INSTrument:SYSTem?

Application Status Query

Function

This command queries the status of the application.

Query

`:INSTrument:SYSTem? <apl_name>`

Response

`<status>,<window>`

Parameter

<code><apl_name></code>	Target application name
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
SG	Signal Generator
CONFIG	Config
TRXSC	TRX Sweep Calibration
<code><status></code>	Application status
CURR	Executed and targeted for operation
RUN	Executed but not targeted for operation
IDLE	Loaded but not executed
UNL	Not loaded
<code><window></code>	Application window status
ACT	Operation enabled (displayed on top screen)
INAC	Inactive
MIN	Minimized
NON	Not displayed

Details

This function is used to switch the operation/control target application.

Example of Use

To query the reading for the status of the Spectrum Analyzer.

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

:SETup:TSCalibration:RX:POWer:OFFSet:STATe ON|OFF|1|0

RX Level Offset

Function

This command enables(On)/disables(Off) the RX Level Offset function.

Command

```
:SETup:TSCalibration:RX:POWer:OFFSet:STATe <switch>
```

Parameter

<switch>	Enables/disables the RX Level Offset function
OFF 0	Disabled
ON 1	Enabled
Default	OFF

Example of Use

To enable the RX Level Offset function.
SET:TSC:RX:POW:OFFS:STAT ON

:SETup:TSCalibration:RX:POWer:OFFSet:STATe?

RX Level Offset Query

Function

This command queries the state of the RX Level Offset function.

Query

```
:SETup:TSCalibration:RX:POWer:OFFSet:STATe?
```

Response

```
<switch>
```

Parameter

<switch>	State of the RX Level Offset function (Whether enabled or disabled)
0	Disabled
1	Enabled

Example of Use

To query the state of RX Level Offset function.
SET:TSC:RX:POW:OFFS:STAT?
> 1

`:SETup:TSCalibration:RX:POWer:OFFSet`

`<offset1>,<offset2>,<offset3>,<offset4>,<offset5>,<offset6>,<offset7>,<offset8>,<offset9>,<offset10>,<offset11>,<offset12>,<offset13>,<offset14>,<offset15>,<offset16>,<offset17>,<offset18>,<offset19>,<offset20>`

RX Level Offset Value

Function

This command sets the offset value for signal levels of every segment at TRX Sweep Calibration measurement.

Command

`:SETup:TSCalibration:RX:POWer:OFFSet <Offset_n>`

Parameter

<code><offset_n></code>	Output level offset value for each RX frequency
<code>n</code>	1 to 20
Range	-100.00 dB to +100.00 dB
Resolution	0.01 dB
Default	0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00

Details

Each `<offset_n>` corresponds to the frequency `<freq_n>` set by the `:SETup:TSCalibration:RX:FREQuency:STEP[:VALues]` command.

Example of Use

To set the Output level offset value for each RX frequency.

```
SET:TSC:RX:POW:OFFS
10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00
```

:SETup:TSCalibration:RX:POWer:OFFSet?

RX Level Offset Value Query

Function

This command queries the the offset value for signal levels of every segment at TRX Sweep Calibration measurement.

Query

```
:SETup:TSCalibration:RX:POWer:OFFSet?
```

Response

```
<offset_1>, <offset_2>, ..., <offset_20>
```

Parameter

<offset_n>	Output level offset value for each RX frequency
n	1 to 20
Range	-100.00 dB to +100.00 dB
Resolution	0.01 dB

Details

Each <offset[n]> corresponds to the frequency <freq_[n]> set by the :SETup:TSCalibration:RX:FREQUENCY:STEP[:VALues] command.

Example of Use

To query the Output level offset value for each RX frequency.

```
SET:TSC:RX:POW:OFFS?
```

```
>
```

```
10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00,10.00
```


:SETup:TSCalibration:RX:POWer:OFFSet:ERRor?

RX Level Unleveled State Query

Function

This command checks whether the Segment DUT Rx Power setting falls within the range between the upper and lower limits due to the RX Level Offset setting.

Query

```
:SETup:TSCalibration:RX:POWer:OFFSet:ERRor?
```

Response

```
<integrity_indicator>, <sequence>, <segment>
```

Parameter

<code><integrity_indicator></code>	indicator
0	Not unleveled
1	Unleveled
<code><sequence></code>	First sequence number including unleveled segment
Range	0 to 20 0 if there is no unleveled segment
<code><segment></code>	First unleveled segment number
Range	0 to 80 0 if there is no unleveled segment

Details

If the Segment DUT Rx Power setting is out of the upper and lower limits though the RX Level Offset is set, then the value is rounded within the upper and lower limits before outputting.

Example of Use

```
To query the RX Level Unleveled State.
SET:TSC:RX:POW:OFFS:ERR?
> 0,0,0
```

`:SETup:TSCalibration:TX:FREQuency:STEP[:VALues]`

`<freq_1>,<freq_2>,<freq_3>,<freq_4>,<freq_5>,<freq_6>,<freq_7>,<freq_8>,<freq_9>,<freq_10>,<freq_11>,<freq_12>,<freq_13>,<freq_14>,<freq_15>,<freq_16>,<freq_17>,<freq_18>,<freq_19>,<freq_20>`

Edit Sequence DUT Tx Frequency

Function

This command sets DUT Tx frequency of every segment at TRX Sweep Calibration measurement (during Tx test).

Command

`:SETup:TSCalibration:TX:FREQuency:STEP[:VALues] <freq_n>`

Parameter

<code><freq_n></code>	DUT Tx Frequency of sequence n
<code>n</code>	1 to 20
Range	400 MHz to 3500 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ Hz is used when omitted.
Default	1853.0MHz, 1853.2MHz, 1853.4MHz, 1853.6MHz, 1853.8MHz, 1854.0MHz, 1854.2MHz, 1854.4MHz, 1854.6MHz, 1854.8MHz, 1855.0MHz, 1855.2MHz, 1855.4MHz, 1855.6MHz, 1855.8MHz, 1856.0MHz, 1856.2MHz, 1856.4MHz, 1856.6MHz, 1856.8MHz

Details

The second and the subsequent segments can be omitted

Example of Use

To set DUT Tx frequency of every segment at TRX Sweep Calibration measurement

```
SET:TSC:TX:FREQ:STEP
400MHZ,450MHZ,500MHZ,550MHZ,600MHZ,650MHZ,700MHZ,750MHZ,
800MHZ,850MHZ,900MHZ,950MHZ,1000MHZ,1050MHZ,1100MHZ,1150
MHZ,1200MHZ,1250MHZ,1300MHZ,1350MHZ
```

:SETup:TSCalibration:TX:FREQuency:STEP[:VALues]?

Edit Sequence DUT Tx Frequency Query

Function

This command queries DUT Tx frequency of every segment at TRX Sweep Calibration measurement (during Tx test).

Query

```
:SETup:TSCalibration:TX:FREQuency:STEP[:VALues]?
```

Response

```
<freq_1>,<freq_2>,...,<freq_20>
```

Parameter

<freq_n>	DUT Tx Frequency of sequence n
n	1 to 20
Range	400 MHz to 3500 MHz
Resolution	1 Hz
Suffix code	None, Value is returned in Hz units.

Example of Use

To query DUT Tx frequency of every segment at TRX Sweep Calibration measurement

```
SET:TSC:TX:FREQ:STEP?
```

```
>
```

```
400000000,450000000,500000000,550000000,600000000,650000000,700000000,750000000,800000000,850000000,900000000,950000000,1000000000,1050000000,1100000000,1150000000,1200000000,1250000000,1300000000,1350000000
```

:SETup:TSCalibration:RX:FREQUency:STEP[:VALues]

<freq_1>,<freq_2>,<freq_3>,<freq_4>,<freq_5>,<freq_6>,<freq_7>,<freq_8>,
<freq_9>,<freq_10>,<freq_11>,<freq_12>,<freq_13>,<freq_14>,<freq_15>,<f
req_16>,<freq_17>,<freq_18>,<freq_19>,<freq_20>

Edit Sequence DUT Rx Frequency

Function

This command sets DUT Rx frequency of every segment at TRX Sweep Calibration measurement (during Rx test).

Command

:SETup:TSCalibration:RX:FREQUency:STEP[:VALues] <freq_n>

Parameter

<freq_n>	DUT Rx Frequency of sequence n
n	1 to 20
Range	400 MHz to 3500 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ Hz is used when omitted.
Default	1933.0MHz, 1933.2MHz, 1933.4MHz, 1933.6MHz, 1933.8MHz, 1934.0MHz, 1934.2MHz, 1934.4MHz, 1934.6MHz, 1934.8MHz, 1935.0MHz, 1935.2MHz, 1935.4MHz, 1935.6MHz, 1935.8MHz, 1936.0MHz, 1936.2MHz, 1936.4MHz, 1936.6MHz, 1936.8MHz

Details

The second and the subsequent segments can be omitted

Example of Use

To set DUT Rx frequency of every segment at TRX Sweep Calibration measurement

SET:TSC:RX:FREQ:STEP

400MHZ,450MHZ,500MHZ,550MHZ,600MHZ,650MHZ,700MHZ,750MHZ,
800MHZ,850MHZ,900MHZ,950MHZ,1000MHZ,1050MHZ,1100MHZ,1150
MHZ,1200MHZ,1250MHZ,1300MHZ,1350MHZ

:SETup:TSCalibration:RX:FREQUENCY:STEP[:VALues]?

Edit Sequence DUT Rx Frequency Query

Function

This command queries DUT Rx frequency of every segment at TRX Sweep Calibration measurement (during Rx test).

Query

```
:SETup:TSCalibration:RX:FREQUENCY:STEP[:VALues]?
```

Response

```
<freq_1>,<freq_2>,...,<freq_20>
```

Parameter

<freq_n>	DUT Rx Frequency of sequence n
n	1 to 20
Range	400 MHz to 3500 MHz
Resolution	1 Hz
Suffix code	None, Value is returned in Hz units.

Example of Use

To query DUT Rx frequency of every segment at TRX Sweep Calibration measurement

```
SET:TSC:RX:FREQ:STEP?
```

```
>
```

```
400000000,450000000,500000000,550000000,600000000,650000000,700000000,750000000,800000000,850000000,900000000,950000000,1000000000,1050000000,1100000000,1150000000,1200000000,1250000000,1300000000,1350000000
```

:SETup:TSCalibration:POWer:STEP:COUNT <integer>

Segment DUT Tx Power Count

Function

This command sets number of segments at TRX Sweep Calibration measurement.

Command

```
:SETup:TSCalibration:POWer:STEP:COUNT <integer>
```

Parameter

<integer>	Measured number of segments
Range	1 to 80
Resolution	1
Suffix code	None
Default	40

Example of Use

To set number of segments to 40 at TRX Sweep Calibration measurement.

```
SET:TSC:POW:STEP:COUN 40
```

:SETup:TSCalibration:POWer:STEP:COUNT?

Segment DUT Tx Power Count Query

Function

This command queries number of segments at TRX Sweep Calibration measurement.

Query

```
:SETup:TSCalibration:POWer:STEP:COUNT?
```

Response

```
<integer>
```

Parameter

<integer>	Measured number of segments
Range	1 to 80
Resolution	1
Suffix code	None

Example of Use

To query number of segments at TRX Sweep Calibration measurement.

```
SET:TSC:POW:STEP:COUN?
```

```
> 40
```

:SETup:TSCalibration:POWer:STEP:LENGth <integer>

Segment DUT Tx Power Step Time

Function

This command sets the duration of segments at TRX Sweep Calibration measurement.

Command

```
:SETup:TSCalibration:POWer:STEP:LENGth <integer> <t>
```

Parameter

<integer>	Segment Duration
10	10 ms
20	20 ms (Default)

Example of Use

To set the duration of segments to 10 ms at TRX Sweep Calibration measurement .

```
SET:TSC:POW:STEP:LENG 10
```

:SETup:TSCalibration:POWer:STEP:LENGth?

Segment DUT Tx Power Step Time Query

Function

This command queries the duration of segments at TRX Sweep Calibration measurement.

Query

```
:SETup:TSCalibration:POWer:STEP:LENGth?
```

Response

```
<integer>
```

Parameter

<integer>	Segment Duration
Range	10, 20
Suffix code	None, Value is returned in ms units.

Example of Use

To query the duration of segments at TRX Sweep Calibration measurement

```
SET:TSC:POW:STEP:LENG?
```

```
> 10
```

:SETup:TSCalibration:FREQuency:STEP:COUNT <integer>

Sequence Frequency Count

Function

This command sets number of sequences for TRX Sweep Calibration measurement.

Command

```
:SETup:TSCalibration:FREQuency:STEP:COUNT <integer>
```

Parameter

<integer>	Measured number of sequences
Range	1 to 20
Resolution	1
Suffix code	None
Default	20

Example of Use

To set number of sequences to 20 for TRX Sweep Calibration measurement.

```
SET:TSC:FREQ:STEP:COUN 20
```

:SETup:TSCalibration:FREQuency:STEP:COUNT?

Sequence Frequency Count Query

Function

This command queries number of sequences for TRX Sweep Calibration measurement.

Query

```
:SETup:TSCalibration:FREQuency:STEP:COUNT?
```

Response

```
<integer>
```

Parameter

<integer>	Measured number of sequences
Range	1 to 20
Resolution	1
Suffix code	None

Example of Use

To query number of sequences for TRX Sweep Calibration measurement.

```
SET:TSC:FREQ:STEP:COUN?
```

```
> 20
```


:SETup:TSCalibration:TIMEout <integer>

Measure TRX Sweep Calibration Timeout

Function

This command sets the timeout from start of measurement to trigger detection at TRX Sweep Calibration measurement.

Command

```
:SETup:TSCalibration:TIMEout <integer>
```

Parameter

<integer>	The timeout from start of measurement to trigger detection at TRX Sweep Calibration measurement
Range	1 s to 30 s
Resolution	1 s
Suffix code	NS, US, MS, S S is used when omitted.
Default	5 s

Example of Use

To set the timeout from start of measurement to trigger detection to 10 s at TRX Sweep Calibration measurement.

```
SET:TSC:TIM 10
```

:SETup:TSCalibration:TIMEout?

Measure TRX Sweep Calibration Timeout Query

Function

This command queries the timeout from start of measurement to trigger detection at TRX Sweep Calibration measurement.

Query

:SETup:TSCalibration:TIMEout?

Response

<integer>

Parameter

<integer> The timeout from start of measurement to trigger detection at TRX Sweep Calibration measurement

Range 1 s to 30 s

Resolution 1 s

Suffix code None, Value is returned in S units.

Example of Use

To query the timeout from start of measurement to trigger detection at TRX Sweep Calibration measurement.

```
SET:TSC:TIM?
```

```
> 10
```

:SETup:TSCalibration:RATio <real>

Measure TRX Sweep Calibration Ratio

Function

This command sets the power measurement range of each segment at TRX Sweep Calibration measurement.

Command

```
:SETup:TSCalibration:RATio <real>
```

Parameter

<real>	The power measurement range of each segment at TRX Sweep Calibration measurement
Range	0.20 to 0.90
Resolution	0.01 (ratio of which 1.00 is one segment)
Suffix code	None
Default	0.50

Details

This changes the power measurement range of each segment at TRX Sweep Calibration measurement. The range is centered in the middle of the segment.

Example of Use

To set the power measurement range of each segment to 0.60 at TRX Sweep Calibration measurement.

```
SET:TSC:RAT 0.60
```

:SETup:TSCalibration:RATio?

TRX Sweep Calibration Ratio Query

Function

This command queries the power measurement range of each segment at TRX Sweep Calibration measurement.

Query

:SETup:TSCalibration:RATio?

Response

<real>

Parameter

<real>	The power measurement range of each segment at TRX Sweep Calibration measurement
Range	0.20 to 0.90
Resolution	0.01 (ratio of which 1.00 is one segment)
Suffix code	None

Example of Use

To query the power measurement range of each segment at TRX Sweep Calibration measurement.

```
SET:TSC:RAT?  
> 0.50
```

:SETup:TSCalibration:OFFSet <real>

TRX Sweep Calibration Time Offset

Function

This command sets the time offset between the measurement trigger and the measurement segment boundary for TX measurement time.

Command

```
:SETup:TSCalibration:OFFSet <real>
```

Parameter

<real>	The time offset as the ratio of the segment duration
Range	0.00 to 0.05
Resolution	0.01 (ratio of which 1.00 is one segment)
Suffix code	None
Default	0.00

Details

When the TRX Sweep Calibration measurement is executed, the TX measurement is delayed by time offset.

Example of Use

To set the time offset to 0.05 at TRX Sweep Calibration measurement.

```
SET:TSC:OFFS 0.05
```

:SETup:TSCalibration:OFFSet?

TRX Sweep Calibration Time Offset Query

Function

This command queries the time offset between the measurement trigger and the measurement segment boundary for TX measurement.

Query

:SETup:TSCalibration:OFFSet?

Response

<real>

Parameter

<real>	The time offset as the ratio of the segment duration
Range	0.00 to 0.05
Resolution	0.01 (ratio of which 1.00 is one segment)
Suffix code	None

Example of Use

To query the time offset at TRX Sweep Calibration measurement.
SET:TSC:OFFS?
>0.05

:SETup:TSCalibration:MODE TRX|RX

TRX Sweep Calibration Mode Select

Function

This command switches the measurement mode between TRX and RX.

Command

`:SETup:TSCalibration:MODE <MODE>`

Parameter

<MODE>	Measurement mode
TRX	Sets to TRX.
RX	Sets to RX.
Default	TRX

Details

Set to RX if doing RX measurement using trigger sequence.

Example of Use

To set the RX Measurement

```
SET:TSC:MOD RX
```

:SETup:TSCalibration:MODE?

TRX Sweep Calibration Mode Select Query

Function

This command queries the measurement mode.

Query

`:SETup:TSCalibration:MODE?`

Response

<MODE>

Parameter

<MODE>	Measurement mode
TRX	TRX measurement
RX	RX measurement

Example of Use

To query the Measurement Mode

```
SET:TSC:MODE?
> RX
```

:SETup:TSCalibration:RTSequence:SBURst:STEP:COUNT <integer>

Short Burst Segment Count

Function

This command sets the Short Burst Segment counts of trigger sequence, in RX mode.

Command

```
:SETup:TSCalibration:RTSequence:SBURst:STEP:COUNT  
<integer>
```

Parameter

<integer>	Short Burst Segment count
Range	1 to 100
Resolution	1
Default	1

Details

Sets Short Burst Segment count. Available when RX mode is selected.

Example of Use

To set number of segment to 5 for Short Burst at RX Measurement Mode.
SET:TSC:RTS:SBUR:STEP:COUN 5

:SETup:TSCalibration:RTSequence:SBURst:STEP:COUNT?

Short Burst Segment Count Query

Function

This command queries the Short Burst Segment counts of trigger sequence, in RX mode.

Query

```
:SETup:TSCalibration:RTSequence:SBURst:STEP:COUNT?
```

Response

```
<integer>
```

Parameter

<integer>	Short Burst Segment count
Range	1 to 100
Resolution	1

Example of Use

To query the number of segment for short burst
SET:TSC:RTS:SBUR:STEP:COUN?
> 5

:SETup:TSCalibration:RTSequence:TOFFset:STEP:COUNT <integer>

Time Offset Segment Count

Function

This command sets the Time Offset Segment counts of trigger sequence, in RX mode.

Command

```
:SETup:TSCalibration:RTSequence:TOFFset:STEP:COUNT
<integer>
```

Parameter

<integer>	Time Offset Segment count
Range	1 to 100
Resolution	1
Default	1

Details

Sets Time Offset Segment count. Available when RX mode is selected.

Example of Use

To set number of segment to 5 for Time Offset at RX Measurement Mode.
 SET:TSC:RTS:TOFF:STEP:COUN 5

:SETup:TSCalibration:RTSequence:TOFFset:STEP:COUNT?

Time Offset Segment Count Query

Function

This command queries the Time Offset Segment counts of trigger sequence, in RX mode.

Query

```
:SETup:TSCalibration:RTSequence:TOFFset:STEP:COUNT?
```

Response

```
<integer>
```

Parameter

<integer>	Time Offset Segment count
Range	1 to 100
Resolution	1

Example of Use

To query the number of segment for Time Offset
 SET:TSC:RTS:TOFF:STEP:COUN?
 > 5

:SETup:TSCalibration:RTSequence:SBURst:POWer <pow>

Short Burst Level

Function

This command sets the Short Burst transmission power of trigger sequence, in RX mode.

Command

```
:SETup:TSCalibration:RTSequence:SBURst:POWer <pow>
```

Parameter

<pow>	Rx Power of Short Burst
Range	-120.0 dBm to -5.0 dBm
Resolution	0.1 dBm
Suffix code	DBM, DM
Default	-15.0 dBm

Details

Sets the Short Burst power that the instrument transmits in RX mode.

Example of Use

To set the power of Short Burst to -20 dBm at RX Measurement Mode.
SET:TSC:RTS:SBUR:POW -20

:SETup:TSCalibration:RTSequence:SBURst:POWer?

Short Burst Level Query

Function

This command queries the Short Burst transmission power of trigger sequence, in RX mode.

Query

```
:SETup:TSCalibration:RTSequence:SBURst:POWer?
```

Response

```
<pow>
```

Parameter

<pow>	Rx Power of Short Burst
Range	-120.0 dBm to -5.0 dBm
Resolution	0.1 dBm
Suffix code	None, Value is returned in dBm units.

Example of Use

To query the power of short burst
SET:TSC:RTS:SBUR:POW?
> -20.0

:INITiate[:IMMediate]

Initiate

Function

This command starts the measurement.

Command

:INITiate[:IMMediate]

Details

In this application program, this command becomes the same operation as :INITiate:TSCalibration.

Example of Use

To start measurement
INIT

:INITiate:TSCalibration

TRX Sweep Calibration Initiate

Function

This command starts the measurement.

Command

:INITiate:TSCalibration

Details

Starts measurement according to the specified measurement mode.

Example of Use

To start measurement
INIT:TSC

:ARM:TSCalibration?

TRX Sweep Calibration Arm Query

Function

This command queries the status of measurement preparation at TRX Sweep Calibration measurement.

Query

:ARM:TSCalibration?

Response

<status>

Parameter

<status>	The status of measurement preparation at TRX Sweep Calibration measurement
0	Not Ready
1	Ready

Example of Use

To query the status of measurement preparation at TRX Sweep Calibration measurement.

ARM:TSC?

> 1

:FETCh:TSCalibration[1]?

TRX Sweep Calibration Fetch to Read TX Power Results

Function

This command queries the result for TRX Sweep Calibration measurement.

Query

```
:FETCh:TSCalibration[1]?
```

Response

```
<level_n>
```

Parameter

<level_n>	Power level of segment n
Range of n	Multiplier of :SET:TSC:POW:STEP:COUN parameter and :SET:TSC:FREQ:STEP:COUN parameter
Resolution	0.01 dBm
Suffix code	None, Value is returned in dBm units.

Details

The power level of the tuning segment is excluded from the result.

Example of Use

To query the result for TRX Sweep Calibration measurement.

```
FETC:TSC?
```

```
> 10.00,11.00,12.00,13.00,14.00,15.00
```

:SETup:TSCalibration:FREQuency:SPAN <freq>

Span Frequency

Function

This command sets the span frequency.

Command

```
:SETup:TSCalibration:FREQuency:SPAN <freq>
```

Parameter

<freq>	Span frequency
Range/Resolution	2500000, 5000000, 10000000, 25000000
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ Hz is used when omitted.
Default	25 MHz

Example of Use

To set the span frequency to 5 MHz.
SET:TSC:FREQ:SPAN 5MHZ

:SETup:TSCalibration:FREQuency:SPAN?

Span Frequency Query

Function

This command queries the span frequency.

Query

```
:SETup:TSCalibration:FREQuency:SPAN?
```

Response

```
<freq>
```

Parameter

<freq>	Span frequency
Range/Resolution	2500000, 5000000, 10000000, 25000000
Suffix code	None, Value is returned in Hz units.

Example of Use

To query the span frequency
SET:TSC:FREQ:SPAN?
> 5000000

:SETup:TSCalibration:FILTer:TYPE OFF|RNYQuist

TRX Sweep Calibration Filter Type

Function

This command sets filter type for TRX Sweep Calibration measurement.

Command

```
:SETup:TSCalibration:FILTer:TYPE <filter>
```

Parameter

<filter>	Filter type
OFF	No filtering (Default)
RNYQuist	Root Nyquist filter

Details

When the setting of the frequency span is only 5 MHz, the route nyquist filter is effective.

When the setting of the frequency span is not 5 MHz, the setting of Route Nyquist filter is treated as no filtering though the parameter change is possible.

Example of Use

To set the filter type to Root Nyquist.

```
SET:TSC:FILT:TYPE RNYQ
```

:SETup:TSCalibration:FILTer:TYPE?

TRX Sweep Calibration Filter Type Query

Function

This command queries the filter type for TRX Sweep Calibration measurement.

Query

```
:SETup:TSCalibration:FILTer:TYPE?
```

Response

```
<filter>
```

Parameter

<filter>	Filter type
OFF	No filtering
RNYQ	Root Nyquist filter

Example of Use

To query the filter type for TRX Sweep Calibration measurement.

```
SET:TSC:FILT:TYPE?
> RNYQ
```

:SETup:TSCalibration:TRIGger[:STATE] ON|OFF|1|0

TRX Sweep Calibration Trigger Switch

Function

This command sets the measurement trigger status to On/Off for TRX Sweep Calibration measurement.

Command

```
:SETup:TSCalibration:TRIGger[:STATE] <switch>
```

Parameter

<switch>	The status of measurement trigger for TRX Sweep Calibration measurement
OFF 0	Trigger OFF
ON 1	Trigger ON
Default	ON

Details

When the trigger is OFF, the measurement starts immediately after initiate command.

When the trigger is ON, the measurement waits for the TX signal power which is above the trigger level after initiate command.

Example of Use

To set the trigger to OFF for TRX Sweep Calibration measurement.
SET:TSC:TRIG OFF

:SETup:TSCalibration:TRIGger[:STATE]?

TRX Sweep Calibration Trigger Switch Query

Function

This command queries the measurement trigger status for TRX Sweep Calibration measurement.

Query

```
:SETup:TSCalibration:TRIGger[:STATE]?
```

Response

```
<switch>
```

Parameter

<code><switch></code>	The status of measurement trigger for TRX Sweep Calibration measurement
0	Trigger OFF
1	Trigger ON

Example of Use

To query the trigger status for TRX Sweep Calibration measurement.

```
SET:TSC:TRIG?
> 1
```

:SETup:TSCalibration:TRIGger:LEVel <level>

TRX Sweep Calibration Trigger Level

Function

This command sets the external trigger level for TRX Sweep Calibration measurement.

Command

```
:SETup:TSCalibration:TRIGger:LEVel <level>
```

Parameter

<code><level></code>	The external trigger level for TRX Sweep Calibration measurement
Range	-30 to -10 dB
Resolution	1 dB
Suffix code	DB
	DB is used when omitted.
Default	-30 dB

Example of Use

To set the external trigger level to -10 dB for TRX Sweep Calibration measurement.

```
SET:TSC:TRIG:LEV -10
```

:SETup:TSCalibration:TRIGger:LEVel?

TRX Sweep Calibration Trigger Level Query

Function

This command queries the external trigger level for TRX Sweep Calibration measurement.

Query

:SETup:TSCalibration:TRIGger:LEVel?

Response

<level>

Parameter

<level>	The external trigger level for TRX Sweep Calibration measurement
Range	-30 to -10 dB
Resolution	1 dB
Suffix code	None, Value is returned in DB units.

Example of Use

To query the external trigger level for TRX Sweep Calibration measurement.

```
SET:TSC:TRIG:LEV?  
> -10
```

Chapter 3 SCPI Status Register

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

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	:STATus:QUEStionable:MEASure:ENABle <integer>.....	3-10
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	:STATus:OPERation:CONDition?	3-14
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	:STATus:OPERation:NTRansition?	3-16
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3.1 Reading Measurement Status

:STATus:ERRor?

Measurement Status Error Query

Function

This command queries a 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: $2^2 = 4$	Timeout
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

To query a measurement error.
 STAT: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.

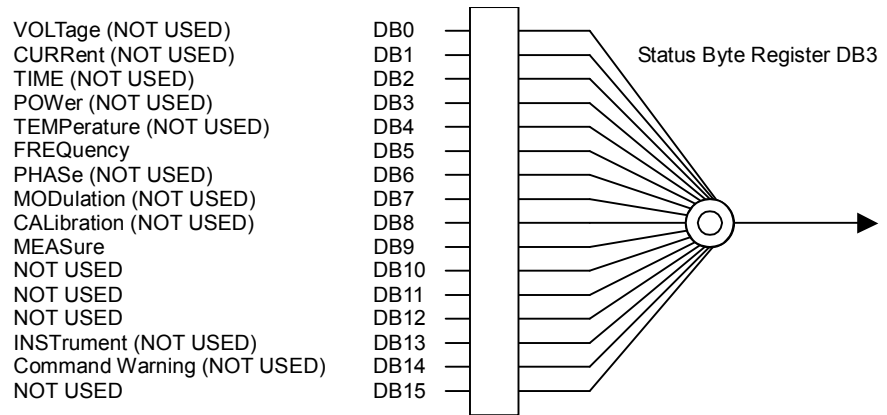


Figure 3.2-1 QUESTIONABLE Status Register

Table 3.2-1 Bit Definition of QUESTIONABLE Status Register

Bit	Definition
DB5	Reference Clock Unlock
DB9	QUESTIONABLE Measure Register Summary

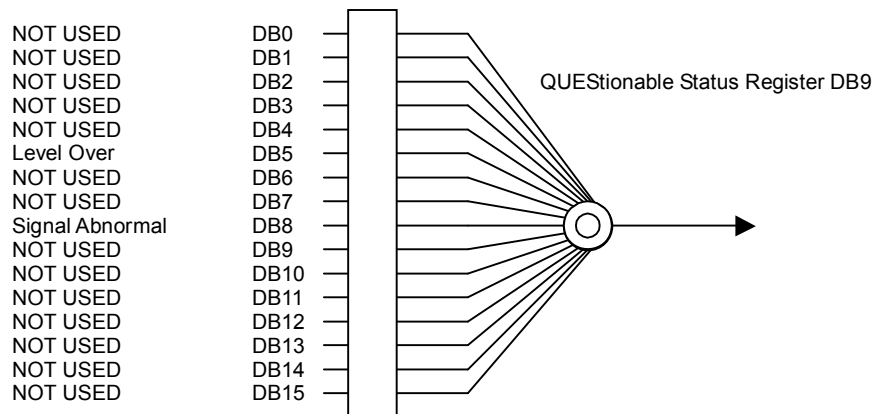


Figure 3.2-2 QUESTIONABLE Measure Register

Table 3.2-2 Bit Definition of QUESTIONABLE Measure Register

Bit	Definition
DB2	Timeout
DB5	Level Over

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

Table 3.2-3 Device Messages for QUESTIONable Status Register

Function	Device Message
Questionable Status Register Event	:STATus:QUESTionable[:EVENT]?
Questionable Status Register Condition	:STATus:QUESTionable:CONDition?
Questionable Status Register Enable	:STATus:QUESTionable:ENABle <integer>
	:STATus:QUESTionable:ENABle?
Questionable Status Register Negative Transition	:STATus:QUESTionable:NTRansition <integer>
	:STATus:QUESTionable:NTRansition?
Questionable Status Register Positive Transition	:STATus:QUESTionable:PTRansition <integer>
	:STATus:QUESTionable:PTRansition?
Questionable Measure Register Event	:STATus:QUESTionable:MEASure[:EVENT]?
Questionable Measure Register Condition	:STATus:QUESTionable:MEASure:CONDition?
Questionable Measure Register Enable	:STATus:QUESTionable:MEASure:ENABle <integer>
	:STATus:QUESTionable:MEASure:ENABle?
Questionable Measure Register Negative Transition	:STATus:QUESTionable:MEASure:NTRansition <integer>
	:STATus:QUESTionable:MEASure:NTRansition?
Questionable Measure Register Positive Transition	:STATus:QUESTionable:MEASure:PTRansition <integer>
	:STATus:QUESTionable:MEASure:PTRansition?

:STATus:QUEStionable[:EVENT]?

Questionable Status Register Event

Function

This command queries Event register of QUEStionable Status register.

Query

`:STATus:QUEStionable[:EVENT]?`

Response

`<integer>`

Parameter

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

Usage Example

To query event register of QUEStionable Status register.

`STAT:QUES?``> 0`**:STATus:QUEStionable:CONDition?**

Questionable Status Register Condition

Function

This command queries Condition register of QUEStionable Status register.

Query

`:STATus:QUEStionable:CONDition?`

Response

`<integer>`

Parameter

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

Usage Example

To query Condition register of QUEStionable Status register.

`STAT:QUES:COND?``> 0`

:STATus:QUEStionable:ENABle <integer>

Questionable Status Register Enable

Function

This command 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

To set value of Event Enable register of QUEStionable Status register to 16.

```
STAT:QUES:ENAB 16
```

:STATus:QUEStionable:ENABle?

Questionable Status Register Enable Query

Function

This command queries 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

To query Event Enable register of QUEStionable Status register.

```
STAT:QUES:ENAB?
```

```
> 16
```


:STATus:QUEStionable:NTRansition <integer>

Questionable Status Register Negative Transition

Function

This command sets transition filter (Negative Transition) of QUEStionable Status register.

Command

```
:STATus:QUEStionable:NTRansition <integer>
```

Parameter

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

Usage Example

To set transition filter (Negative Transition) of QUEStionable Status register to 16.

```
STAT:QUES:NTR 16
```

:STATus:QUEStionable:NTRansition?

Questionable Status Register Negative Transition Query

Function

This command queries transition filter (Negative Transition) of QUEStionable Status 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

To query transition filter (Negative Transition) of QUEStionable Status register.

```
STAT:QUES:NTR?
```

```
> 16
```

:STATus:QUEStionable:PTRansition <integer>

Questionable Status Register Positive Transition

Function

This command 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

To set transition filter (Positive Transition) of QUEStionable Status register to 16.
STAT:QUES:PTR 16

:STATus:QUEStionable:PTRansition?

Questionable Status Register Positive Transition Query

Function

This command 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

To query transition filter (Positive Transition) of QUEStionable Status register.
STAT:QUES:PTR?
> 16

:STATus:QUEStionable:MEASure[:EVENT]?

Questionable Measure Register Event

Function

This command queries Event register of QUEStionable Measure register.

Query

`:STATus:QUEStionable:MEASure[:EVENT]?`

Response

`<integer>`

Parameter

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

Usage Example

To query Event register of QUEStionable Measure register.

`STAT:QUES:MEAS?``> 0`**:STATus:QUEStionable:MEASure:CONDition?**

Questionable Measure Register Condition

Function

This command queries Condition register of QUEStionable Measure register.

Query

`:STATus:QUEStionable:MEASure:CONDition?`

Response

`<integer>`

Parameter

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

Usage Example

To query Condition register of QUEStionable Measure register.

`STAT:QUES:MEAS:COND?``> 0`

:STATus:QUEStionable:MEASure:ENABle <integer>

Questionable Measure Register Enable

Function

This command sets Event Enable register of QUEStionable Measure register.

Command

```
:STATus:QUEStionable:MEASure:ENABle <integer>
```

Parameter

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

Usage Example

To set a value of Event Enable register of QUEStionable Measure register to 16.

```
STAT:QUES:MEAS:ENAB 16
```

:STATus:QUEStionable:MEASure:ENABle?

Questionable Measure Register Enable Query

Function

This command queries Event Enable register of QUEStionable Measure register.

Query

```
:STATus:QUEStionable:MEASure:ENABle?
```

Response

```
<integer>
```

Parameter

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

Usage Example

To query Event Enable register of QUEStionable Measure register.

```
STAT:QUES:MEAS:ENAB?
```

```
> 16
```

:STATUS:QUESTIONABLE:MEASURE:NTRANSITION <integer>

Questionable Measure Register Negative Transition

Function

This command sets transition filter (Negative Transition) of QUESTIONABLE Measure register.

Command

```
:STATUS:QUESTIONABLE:MEASURE:NTRANSITION <integer>
```

Parameter

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

Usage Example

To set transition filter (Negative Transition) of QUESTIONABLE Measure register to 16.

```
STAT:QUES:MEAS:NTR 16
```

:STATUS:QUESTIONABLE:MEASURE:NTRANSITION?

Questionable Measure Register Negative Transition Query

Function

This command queries transition filter (Negative Transition) of QUESTIONABLE Measure register.

Query

```
:STATUS:QUESTIONABLE:MEASURE:NTRANSITION?
```

Response

```
<integer>
```

Parameter

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

Usage Example

To query transition filter (Negative Transition) of QUESTIONABLE Measure register.

```
STAT:QUES:MEAS:NTR?
```

```
> 16
```

:STATus:QUEStionable:MEASure:PTRansition <integer>

Questionable Measure Register Positive Transition

Function

This command sets transition filter (Positive Transition) of QUEStionable Measure register.

Command

```
:STATus:QUEStionable:MEASure:PTRansition <integer>
```

Parameter

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

Usage Example

To set transition filter (Positive Transition) of QUEStionable Measure register to 16.

```
STAT:QUES:MEAS:PTR 16
```

:STATus:QUEStionable:MEASure:PTRansition?

Questionable Measure Register Positive Transition Query

Function

This command queries transition filter (Positive Transition) of QUEStionable Measure register.

Query

```
:STATus:QUEStionable:MEASure:PTRansition?
```

Response

```
<integer>
```

Parameter

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

Usage Example

To query transition filter (Positive Transition) of QUEStionable Measure register.

```
STAT:QUES:MEAS: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.

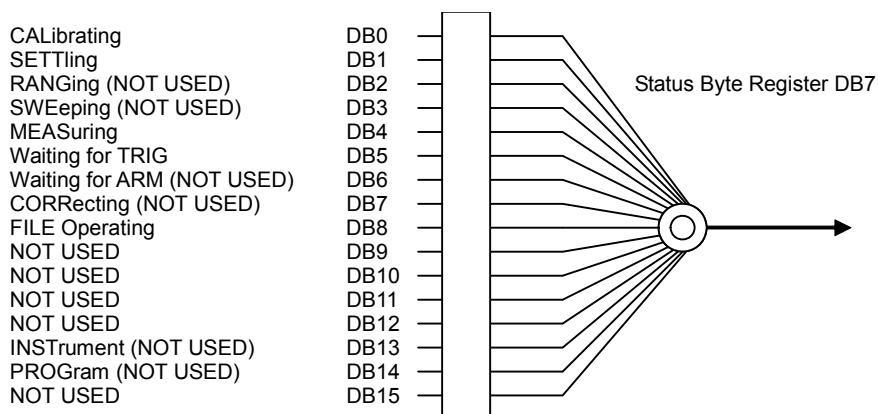


Figure 3.3-1 OPERation Status Register

Table 3.3-1 Bit Definition for OPERation Status Register

Bit	Definition
DB0	CAL Executed
DB1	Warm-up displayed
DB4	Capture executed (Always 1 at Continuous measurement)
DB5	Waiting for trigger signal
DB8	Operating on file

Table 3.3-2 lists the device messages for the OPERation status register.

Table 3.3-2 Device Messages for OPERation Status Register

Function	Device Message
Operation Status Register Event	:STATUS:OPERation[:EVENT]?
Operation Status Register Condition	:STATUS:OPERation:CONDition?
Operation Status Register Enable	:STATUS:OPERation:ENABle <integer>
	:STATUS:OPERation:ENABle?
Operation Status Register Negative Transition	:STATUS:OPERation:NTRansition <integer>
	:STATUS:OPERation:NTRansition?
Operation Status Register Positive Transition	:STATUS:OPERation:PTRansition <integer>
	:STATUS:OPERation:PTRansition?



:STATus:OPERation[:EVENT]?

Operation Status Register Event

Function

This command queries 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

To query Event register of OPERATION Status register.

```
STAT:OPER?
```

```
> 0
```

:STATus:OPERation:CONDition?

Operation Status Register Condition

Function

This command queries 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

To query Event register of OPERATION Condition register.

```
STAT:OPER:COND?
```

```
> 0
```


:STATus:OPERation:ENABLE <integer>

Operation Status Register Enable

Function

This command sets Event Enable register of OPERation Status register.

Command

`:STATus:OPERation:ENABle <integer>`

Parameter

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

Usage Example

To set Event Enable register of OPERation Status register to 16.
`STAT:OPER:ENAB 16`

:STATus:OPERation:ENABLE?

Operation Status Register Enable Query

Function

This command queries Event Enable register of OPERation Status register.

Query

`:STATus:OPERation:ENABle?`

Response

`<integer>`

Parameter

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

Usage Example

To query Event Enable register of OPERation Status register.
`STAT:OPER:ENAB?`
`> 16`

:STATus:OPERation:NTRansition <integer>

Operation Status Register Negative Transition

Function

This command 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

To set transition filter (Negative Transition) of OPERATION Status register to 16.
STAT:OPER:NTR 16

:STATus:OPERation:NTRansition?

Operation Status Register Negative Transition Query

Function

This command queries 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

To query transition filter (Negative Transition) of OPERATION Status register.
STAT:OPER:NTR?
> 16

:STATUS:OPERation:PTRansition <integer>

Operation Status Register Positive Transition

Function

This command 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

To set transition filter (Positive Transition) of OPERATION Status register to 16.

```
STAT:OPER:PTR 16
```

:STATUS:OPERation:PTRansition?

Operation Status Register Positive Transition Query

Function

This command queries 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

To query transition filter (Positive Transition) of OPERATION Status register.

```
STAT:OPER:PTR?
```

```
> 16
```


Appendix A Programming Sample

Select a waveform pattern for RX test on Signal Analyzer Application

Command	Description
INST SG	Switches the active application to SG
MMEM:LOAD:WAV? "CDMA", "TEST"	Queries the status of waveform pattern.
> 1	"TEST" waveform is available
MMEM:LOAD:WAV "CDMA", "TEST"	Loads the waveform pattern from the hard disk to the waveform memory.
*OPC?	Queries the operation completion status.
> 1	The waveform patterns have been loaded.
RAD:ARB:WAV "CDMA", "TEST"	Selects the waveform pattern to be played.
RAD:ARB:WAV:REST	Plays the waveform pattern

TRX Sweep Calibration Setting

Command	Description
INST TRXSC	Switches the active application to TRX Sweep Calibration.
SET:TSC:FREQ:SPAN 10MHZ	Setting frequency span
SET:TSC:TRIG:LEV -20DB	Setting the trigger level
SET:TSC:TX:FREQ:STEP 825.03MHZ, 837.00MHZ, 848.97MHZ	Setting the frequency list of each sequence for TX measurement
SET:TSC:RX:FREQ:STEP 870.03MHZ, 882.00MHZ, 893.97MHZ	Setting the frequency list of each sequence for RX measurement
SET:TSC:RX:POW:STEP -55, -40, -40, -30, -30, -25, -25, -22, -22	Setting the power levels list of each segment for RX measurement
SET:TSC:TX:POW:STEP 30, 26, 22, 18, 14, 10, 6, 2, -2	Setting the power levels list of each segment for TX measurement
SET:TSC:POW:STEP:COUN 9	Setting the number of segments
SET:TSC:FREQ:STEP:COUN 3	Setting the number of frequency sequence
SET:TSC:TIM 3	Setting the TRX Sweep Calibration's timeout
SET:TSC:RAT 0.60	Setting the TX power measurement window ratio

Appendix A Programming Sample

Executing TRX measurement

Command	Description
INIT:TSC	Initiates the TRX Sweep Calibration measurement.
ARM:TSC?	Queries the ready status of TRX Sweep Calibration.
> 0	Not ready
ARM:TSC?	Re-queries until responding '1'.
> 1	Ready
(Orders the DUT to begin transmission of its TX Frequency/Power Series.)	
STAT:ERR?	Queries the measurement status
> 1	Measurement in progress
STAT:ERR?	Re-queries until responding other than '1'.
> 0	Normal termination
FETC:TSC?	Queries the TRX Sweep Calibration measurement result.
> 30.00, 28.00, 26.00, 24.00, 22.00, 20.00, 18.00, 16.00, 14.00, 30.01, 28.01, 26.01, 24.01, 22.01, 20.01, 18.01, 16.01, 14.01, 30.02, 28.02, 26.02, 24.02, 22.02, 20.02, 18.02, 16.02, 14.02	The results are returned to the time series without tuning segment. (The number of Tx Power measurement results is 27, as the number of segment is 9 and the number of sequence is 3.)