MX269050A
Extended Digitizing Software
Operation Manual
Remote Control

First Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided within the MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation) and MX269050A Extended Digitizing Software Operation Manual (Operation). Please also refer to this document before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W3109AE-1.0

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

These indicate that the marked part should be recycled.

MX269050A
Extended Digitizing Software
Operation Manual Remote Control

25 August 2008 (First Edition)

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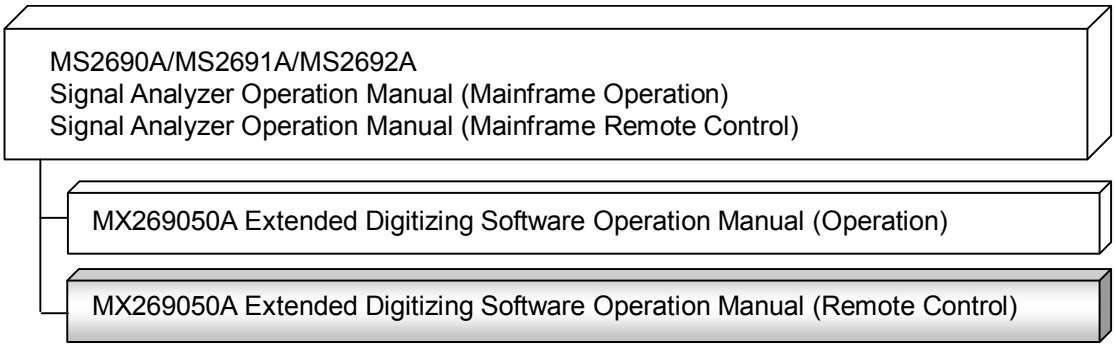
About This Manual

■ Composition of Operation Manuals

The operation manuals for MX269050A Extended Digitizing Software are comprised as shown in the figure below.



- Mainframe Operation
- Mainframe Remote Control

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

- MX269050A Extended Digitizing Software Operation Manual (Operation)

This manual describes operating methods of the MX269050A Extended Digitizing Software.

- MX269050A Extended Digitizing Software Operation Manual (Remote Control) <This document>

This manual describes remote control of the MX269050A Extended Digitizing Software.

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Chapter 1 Basics of Remote Control

This chapter provides an overview of the remote control of the MX269050A Extended Digitizing Software (hereinafter referred to as "this application").

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1.1 Outline

This application can be controlled from an external controller (PC) by remote control commands using the MS2690A/MS2691A/MS2692A Signal Analyzer (hereinafter referred to as "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 automatically determined when a command is received at the start of communication. This instrument enters the remote state after the interface has been determined. At remote-interface operation, the front panel Remote lamp lights; the lamp is off at local-interface operation.

Refer to the MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Remote Control) for more details about remote control, such as interface setting.

1.1.2 Controlled Application

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

In this instrument, multiple applications can be activated at the same time. Only one application resource can be executed per piece of hardware at one time. This application digitizes an input signal by using the resource of RF input. Thus, this application cannot be executed at the same time with another application using the same resource. In order to execute a function unique to the application by using remote control, you need to select this application once it has been activated. Furthermore, this application can be executed at the same time as another application that uses by itself a resource not used by this application, such as the MS2690A/MS2691A/MS2692A Option 020 Vector Signal Generator (hereinafter referred to as "Option 020").

1.2 Basic Flow of Control

This section describes the basic remote control command programming operations for the extended digitizing function of this application.

Figure 1.2-1 shows the flow of the basic digitizing process. Note the parameter settings for the extended digitizing and the order of the process.

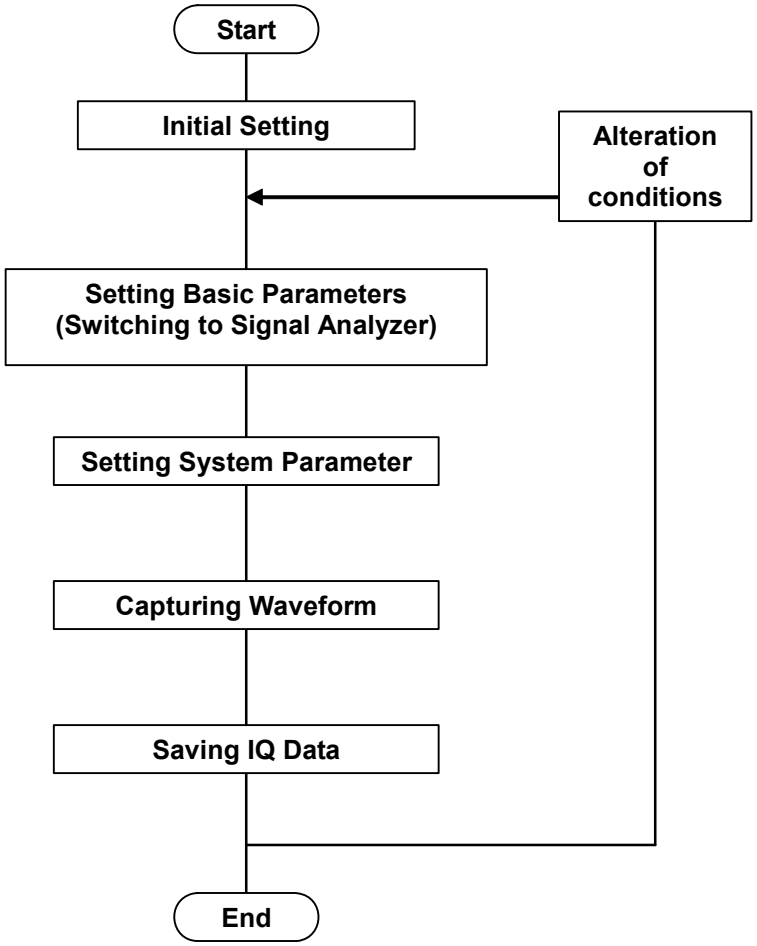

Figure 1.2-1 Flow of Basic Digitizing Process

(1) Initial Setting

Initializes the communication interface and the parameters, sets the communication mode, loads applications, and selects applications.

☞ 1.2.1 Initialization

(2) Setting Basic Parameters

Sets the parameters applied in common to the extended digitizing, such as center frequency, span, reference level, and trigger. You can set the parameters while checking the parameter setting statuses.

☞ 1.2.2 Setting of Basic Parameters
☞ 1.2.3 Switching to Signal Analyzer

(3) Setting System Parameters

Sets the parameters applied to the extended digitizing, such as capture time and capture count.

☞ 1.2.4 Setting System Parameters

(4) Capturing Waveform

Executes the capture function. The capture time length multiplied by the capture count determines the total time it takes to finish the waveform capture. If you stop capturing before it is completed, the data captured until then is obtained.

☞ 1.2.5 Capturing Waveform

(5) Saving IQ Data

Divides the IQ data and then changes the sampling rate, before saving it.

☞ 1.2.6 Saving IQ Data

1.2.1 Initial 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. For details, refer to the MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Remote Control).

(2) Setting Language Mode
Set the language mode used for communicating.
For details, refer to the MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Remote Control).

(3) Starting Application
The application is loaded. The signal analyzer applications should be loaded, too.

(4) Selecting Application
The target application is selected.

(5) Initialization
All parameters and statuses are reset at initialization.

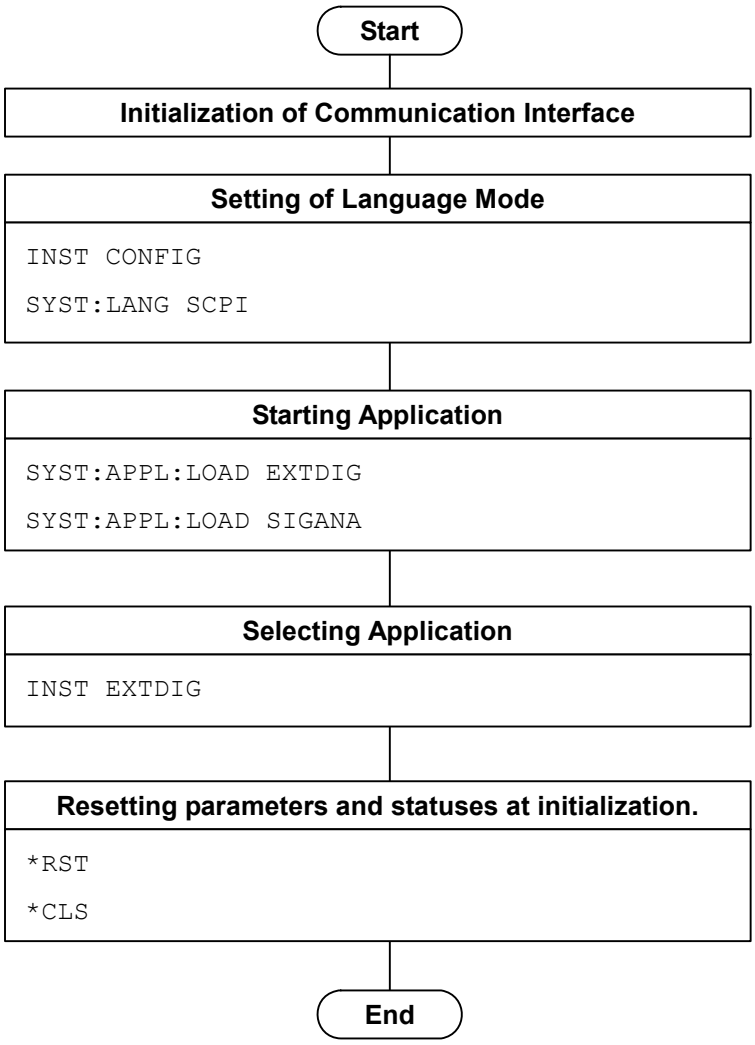

Figure 1.2.1-1 Initialization Flow and Command Example

1.2.2 Setting of Basic Parameters

Set the common parameters (center frequency, reference level, etc.) using this application, or the Signal Analyzer. The basic parameters include the following.

(1) Center Frequency

(2) Span
(20 MHz is set if 20 MHz or more is set in the Signal Analyzer. 100 kHz is set if 100 kHz or less is set.)

(3) Frequency Mode

(4) Reference Level

(5) Level Offset

(6) Attenuator

(7) Pre-Amp (Option)

(8) Trigger

  (a) Trigger Switch

  (b) Trigger Source

  (c) Trigger Slope

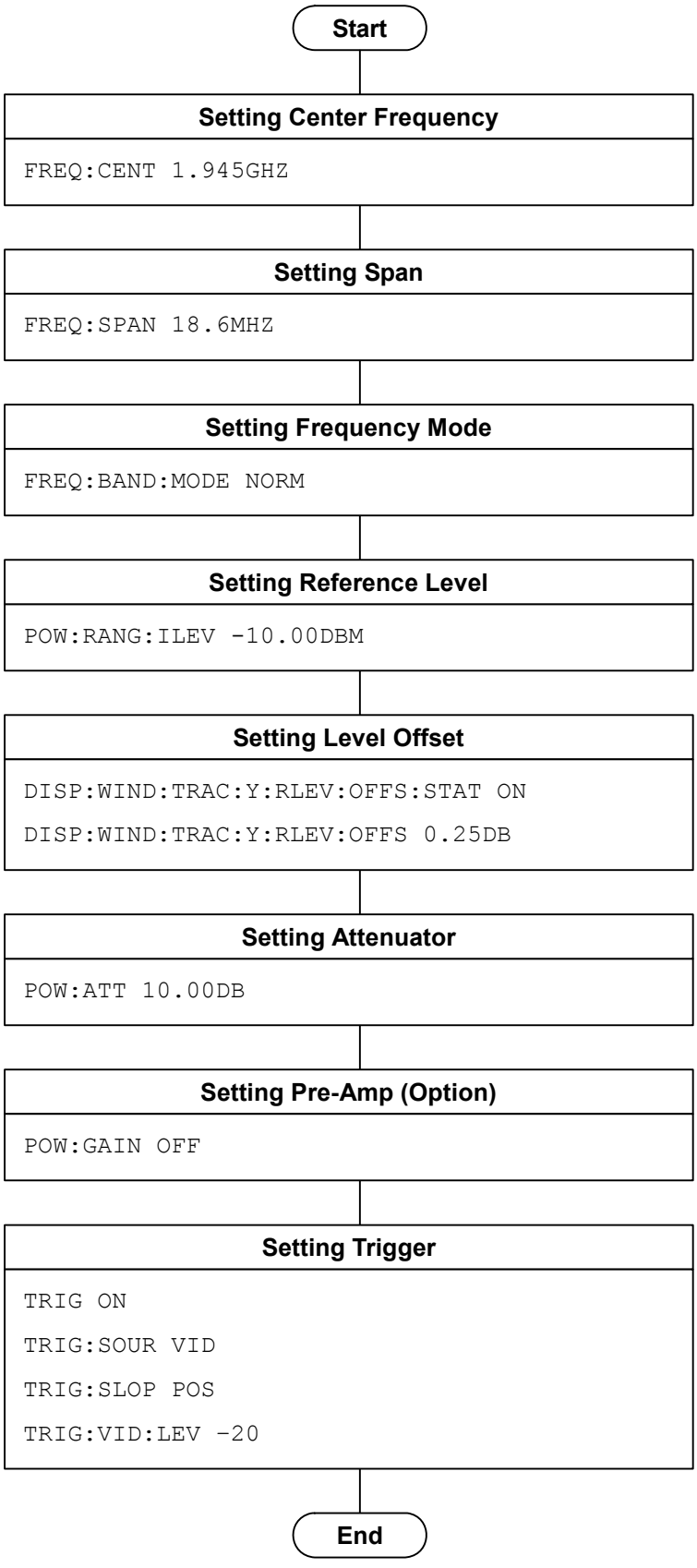

Figure 1.2.2-1 Basic Parameter Setting Flow and Command Examples

1.2.3 Switching to Signal Analyzer

The following two methods are available for switching from this application to the Signal Analyzer during remote control.

(1) Execute `CONFigure:XXXX`.
The basic parameters such as the center frequency and reference level are automatically set in the Signal Analyzer.
Similarly, the basic parameters, such as the center frequency/reference level changed in the Signal Analyzer, are set when returning to the control of the measurement application by `CONFigure:EXTDig`.

Compared with method (2), you can shorten the execution time of the program, since the basic parameters are set by the Signal Analyzer functions and you do not need to reset the basic parameters.

(2) Execute `:INSTrument[:SELect] SIGANA`.
No parameter is automatically set by this method.

Note:

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

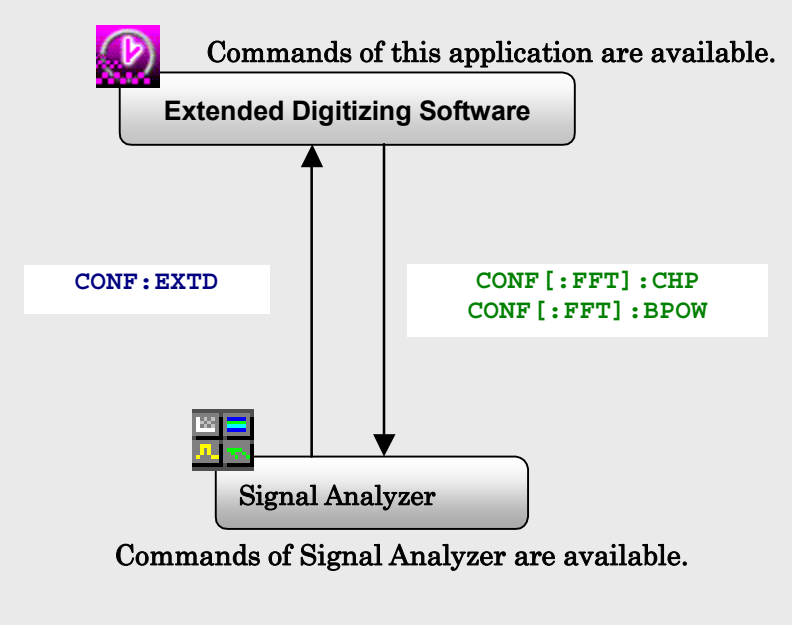

Figure 1.2.3-1 Switching of Measurement Functions between Applications

Figure 1.2.3-1 shows the commands to switch to the Signal Analyzer. For example, in order to invoke the Channel Power measurement function of the Signal Analyzer from this application, you need to program `CONF:CHP`. The parameters common to this application can be set by the signal analyzer functions.
In order to switch to this application from the Signal Analyzer, you need to program `CONF:EXTD`. The parameters set in the Signal Analyzer functions are then automatically set to the parameters of this application.
If you switch to the Signal Analyzer from this application, the parameters set in this application are automatically set to the parameters of the Signal Analyzer.

1.2.4 Setting System Parameters

Set the parameters used for capturing waveforms by this application. Unless specified, there is no specific parameter setting order.

(1) Capture Time Length

(2) Capture Count

(3) Capture File Name

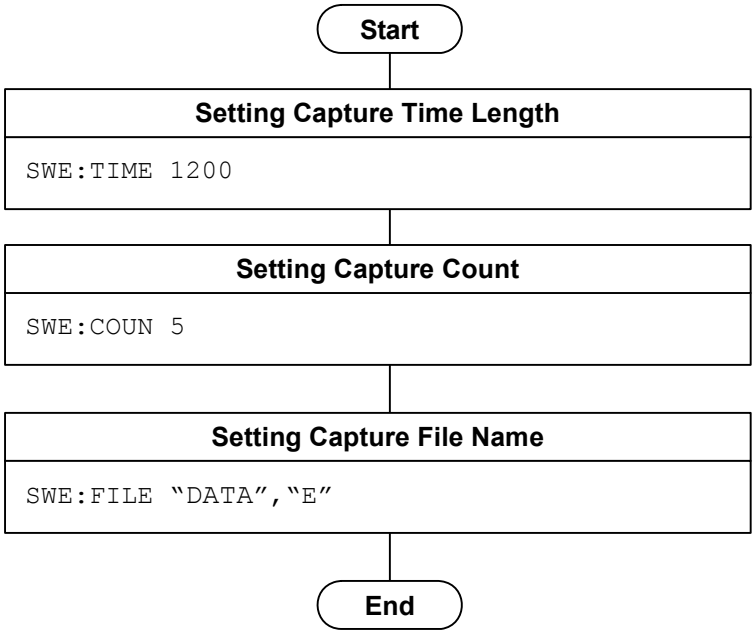

Figure 1.2.4-1 Flow of System Parameter Settings and Command Examples

1.2.5 Capturing Waveform

This section describes how to execute the capturing function in the following order:

(1) Start capturing waveform

(2) Stop capturing waveform
The total time required to finish the waveform capture is determined by the capture time length multiplied by the capture count. If you stop the capture function before it is completed, the data captured until then is obtained.

(3) Query the result

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

(a) Select Captured Data

(b) Data Length

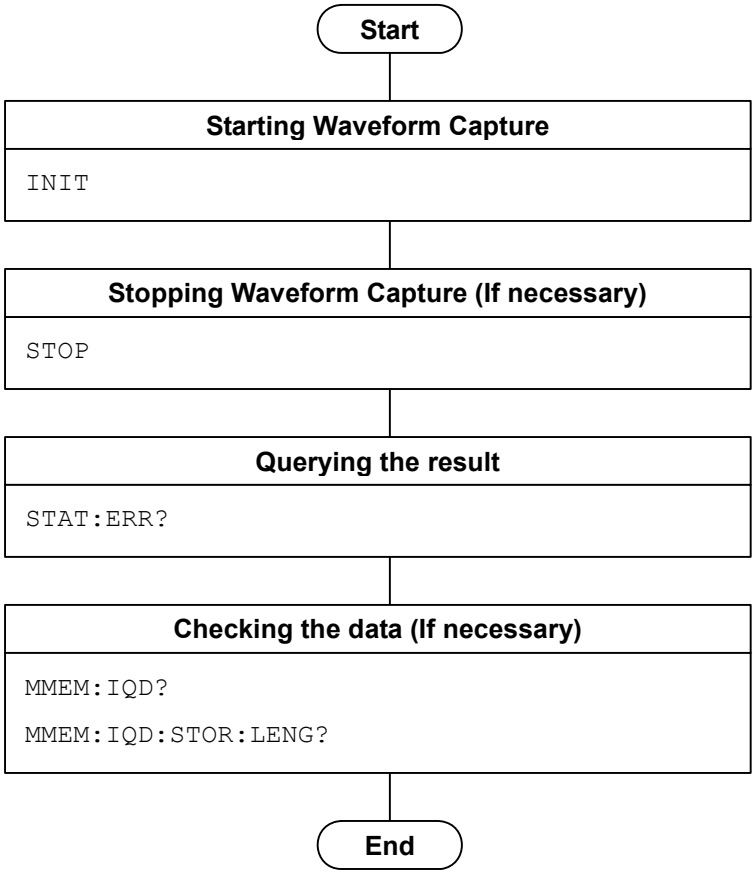

Figure 1.2.5-1 Flow of Capturing Process and Command Examples

1.2.6 Saving IQ Data

This section describes how to save the selected IQ data in the following order:

(1) Select the captured IQ data file

(2) Set the start time for saving IQ data

(3) Set the time length for saving IQ data

(4) Set the size of the divided file

(5) Set the output rate

(6) Save the IQ data

(7) Stop the saving
Stop the saving before it is completed, if needed. The files captured until then are saved.

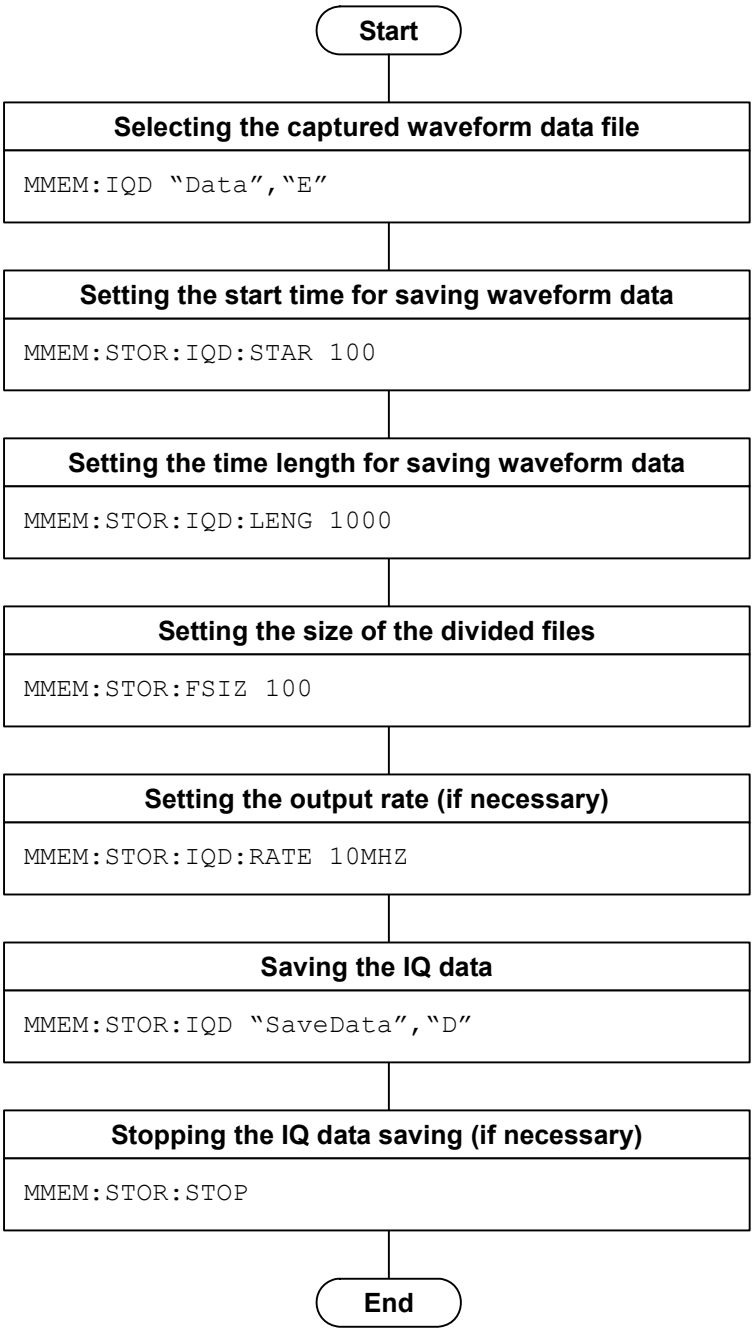

Figure 1.2.6-1 Flow of Saving IQ Data and Command Examples

1.3 Native Mode

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

(1) SCPI Mode
Processes commands conforming to the grammar/document format defined in SCPI (ver1999.0). In the SCPI mode, you can use the character string in long/short form format and can omit angled bracket ([ ]) definition character strings.
On the Configuration screen, the SCPI mode is automatically set after transmitting command SYST:LANG SCPI.

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

Note:

In the Native mode, you cannot use STATus:QUEStionable and STATus:OPERation registers. Even if you convert the commands according to the conversion rules, you cannot, either.

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

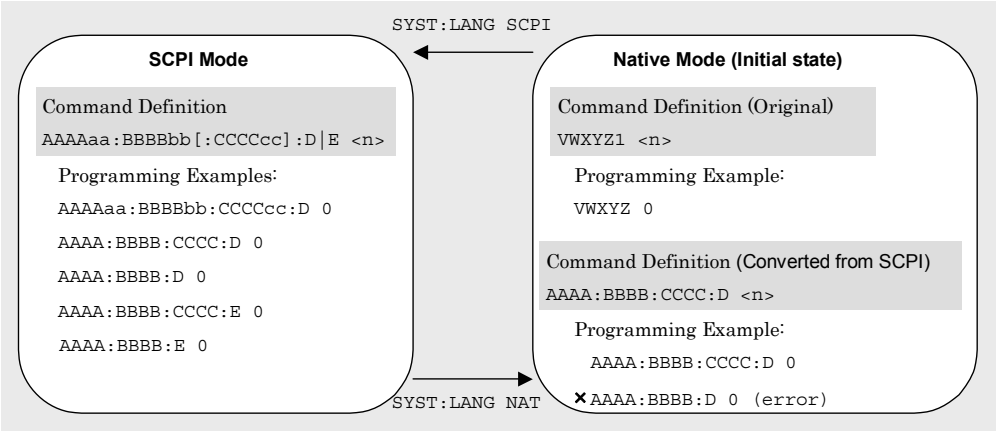

Figure 1.3-1 SCPI and Native modes

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

Conversion Rule

[1] Move the numeric parameter in the program header of an SCPI command before the argument. Delete a numeric parameter which only has one value and can be deleted. Describe the argument if it cannot be deleted.

[2] Use the first node if multiple ones can be selected.

[3] Delete those layers which can be deleted.

[4] Alter all the long-formed characters into short-formed ones.

[5] Delete the colon mark (“**:**”) at the head.

Example 1:

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

[1] Move the numeric parameter in the program header before the argument.

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

↓

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

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

[2] Delete the layers which can be deleted.

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

↓

`:CALCulate:MARKer:CENTer <integer>`

[3] Alter all the long-formed characters into short-formed ones.

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

↓

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

Delete the colon mark (“**:**”) at the head.

:CALC:MARK:CENT <integer>

↓

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 is 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>`

`<rel_power>`

`<integer>`

`<time>`

Chapter 2 SCPI Device Message Details

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

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2.1 Selecting Application

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

Table 2.1-1 Selecting Application Parameter

Parameter	Device Message
Load Application	:SYSTem:APPLication:LOAD EXTDIG
Unload Application	:SYSTem:APPLication:UNLoad EXTDIG
Application Switch	:INSTrument[:SELect] EXTDIG|CONFIG
	:INSTrument[:SELect]?
Application Status	:INSTrument:SYSTem EXTDIG,[ACTive]|INACtive|MINimum
	:INSTrument:SYSTem? EXTDIG
Initialization	:INSTrument:DEFault
	:SYSTem:PRESet

2.1.1 Loading Application

:SYSTem:APPLication:LOAD EXTDIG

Load Application

Function

This command loads this application.

Command

```
:SYSTem:APPLication:LOAD EXTDIG
```

Details

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

Example of Use

To load this application.

```
SYST:APPL:LOAD EXTDIG
```

:SYSTem:APPLication:UNLoad EXTDIG

Unload Application

Function

This command unloads this application.

Command

```
:SYSTem:APPLication:UNLoad EXTDIG
```

Details

This function unloads the running application and removes it from the Application Switch menu.

Example of Use

To unload this application.

```
SYST:APPL:UNL EXTDIG
```

2.1.2 Selecting Application

:INSTrument[:SELect] EXTDIG|CONFIG

Application Switch

Function

This command selects the control-targeted application.

Command

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

Parameter

<apl_name>	Application name
EXTDIG	Extended Digitizing
CONFIG	Config

Details

In order to select the Signal Analyzer from this application, use the following command:

```
:CONFigure:CHPower
:CONFigure:BPOWer
```

Example of Use

To select this application as the control target.

```
INST EXTDIG
```

:INSTrument[:SELect]?

Application Switch Query

Function

This command queries the control-targeted application.

Query

```
:INSTrument[:SELect]?
```

Response

```
<apl_name>
```

Parameter

<apl_name>	Application name
EXTDIG	Extended Digitizing
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
CONFIG	Config

Details

EXTDIG is returned when this application is selected.
SIGANA is returned when the Signal Analyzer is selected.

Example of Use

To query the control-targeted application.

```
INST?
> EXTDIG
```

:INSTrument:SYSTem EXTDIG,[ACTive]|INACtive|MINimum

Application Status

Function

This command selects the window status of this application.

Command

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

Parameter

<apl_name>	Application name
EXTDIG	Extended Digitizing
SIGANA	Signal Analyzer
SPECT	Spectrum Analyzer
CONFIG	Config
<window>	Window status
ACTive	Active
INACtive	Inactive
MINimum	Minimized
When omitted:	Active

Example of Use

To select Active as the window status of this application.

```
INST:SYST EXTDIG,ACT
```

:INSTrument:SYSTem? EXTDIG

Application Status Query

Function

This command queries the application's status.

Query

```
:INSTrument:SYSTem? <apl_name>
```

Response

```
<status>,<window>
```

Parameter

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

Example of Use

To query the application's status.

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

2.1.3 Initialization

:INSTrument:DEFault

Initialization

Function

This command initializes the setting and the status of the selected application.

Command

`:INSTrument:DEFault`

Details

If `:CONFigure:CHPower` or `:CONFigure:BPOWer` is transmitted after `:INST:DEF` has been transmitted by this application, the Signal Analyzer/Spectrum Analyzer parameters are initialized, too.

Example of Use

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

```
INST:DEF
```

:SYSTem:PRESet

Initialization

Function

This command initializes the setting and the status of the selected application.
For details, refer to `:INSTrument:DEFault`.

Example of Use

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

```
SYST:PRES
```

2.2 Setting Basic Parameters

Table 2.2-1 lists device messages for setting the parameters commonly applied to this application, such as frequency, level, and trigger.

Table 2.2-1 Basic Parameter Settings

Function	Device Message
Center Frequency	[:SENSe]:FREQuency:CENTer <freq>
	[:SENSe]:FREQuency:CENTer?
Span	[:SENSe]:FREQuency:SPAN <freq>
	[:SENSe]:FREQuency:SPAN?
Frequency Band Mode	[:SENSe]:FREQuency:BAND:MODE NORMal|SPURious
	[:SENSe]:FREQuency:BAND:MODE?
Sampling Rate	[:SENSe]:FREQuency:SRATe?
Reference Level	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <real>
	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel?
Attenuator Auto	[:SENSe]:POWer[:RF]ATTenuation:AUTO OFF|ON|0|1
	[:SENSe]:POWer[:RF]ATTenuation:AUTO?
Attenuator	[:SENSe]:POWer[:RF]:ATTenuation <rel_ampl>
	[:SENSe]:POWer[:RF]:ATTenuation?
Pre-Amp State	[:SENSe]:POWer[:RF]:GAIN[:STATe] OFF|ON|0|1
	[:SENSe]:POWer[:RF]:GAIN[:STATe]?
Level Offset State	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF|ON|0|1
	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?
Level Offset	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power>
	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?
Trigger Switch	:TRIGger[:SEQuence][:STATe] OFF|ON|0|1
	:TRIGger[:SEQuence][:STATe]?
Trigger Source	:TRIGger[:SEQuence]:SOURce EXTernal[1]|IMMediate|WIF|RFBurst|VIDeo|SG
	:TRIGger[:SEQuence]:SOURce?
Trigger Slope	:TRIGger[:SEQuence]:SLOPe POSitive|NEGative
	:TRIGger[:SEQuence]:SLOPe?
Trigger Level (Video)	:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic] <level>
	:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic]?
Trigger Level (WideIfVideo)	:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute <level>
	:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute?

2.2.1 Center Frequency

[:SENSe]:FREQuency:CENTer <freq>

Center Frequency

Function

This command sets the center frequency.

Command

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

Parameter

<freq>		Center frequency
	Range	0 MHz to 6 GHz (MS2690A) 0 MHz to 13.5 GHz (MS2691A) 0 MHz to 26.5 GHz (MS2692A)
	Resolution	1 Hz
	Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ Hz is used when omitted.
	Default value	6 MHz

Example of Use

To set the center frequency to 123.456 kHz.

```
FREQ:CENT 123456
```

[:SENSe]:FREQuency:CENTer?

Center Frequency Query

Function

This command queries the center frequency.

Query

```
[:SENSe]:FREQuency:CENTer?
```

Response

```
<freq>
```

Parameter

<freq>		Center frequency
	Range	0 MHz to 6 GHz (MS2690A) 0 MHz to 13.5 GHz (MS2691A) 0 MHz to 26.5 GHz (MS2692A)
	Resolution	1 Hz Value is returned in Hz units.

Example of Use

To query the center frequency.

```
FREQ:CENT?
> 123456
```

2.2.2 Span

[:SENSe]:FREQuency:SPAN <freq>

Span

Function

This command sets the span frequency.

Command

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

Parameter

`<freq>`		Span frequency
	Range/Resolution*	100000,250000, 500000, 1000000, 2500000, 5000000, 10000000, 18600000, 20000000
	Suffix code	`HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ`
		Hz is used when omitted.
	Default value	20 MHz

*: 100 kHz is automatically set in this application, if any of the following frequency spans is set in the Signal Analyzer:
1000, 2500, 5000, 10000, 25000, 50000
20 MHz is automatically set in this application, if any of the following frequency spans is set in the Signal Analyzer:
20000000, 31250000, 50000000, 100000000, 125000000

Details

This command is limited by the frequency band mode and the center frequency.

Example of Use

To set the span frequency to 100 kHz.

```
FREQ:SPAN 100kHz
```

[:SENSe]:FREQuency:SPAN?

Span Query

Function

This command queries the span frequency.

Query

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

Response

```
<freq>
```

Parameter

`<freq>`		Span frequency
	Range/Resolution	100000, 250000, 500000, 1000000, 2500000, 5000000, 10000000, 18600000, 20000000 No suffix code. Value is returned in Hz units.

Example of Use

To query the span frequency.

```
FREQ:SPAN?
> 100000
```

2.2.3 Frequency Band Mode

[:SENSe]:FREQuency:BAND:MODE NORMal|SPURious

Frequency Band Mode

Function

This command sets the frequency band path. The frequency at which the path is switched to the preselector band or a path that does not pass through the preselector can be set with this function.

Command

```
[:SENSe]:FREQuency:BAND:MODE <mode>
```

Parameter

`<mode>`	Frequency band mode
`NORMal`	Sets the frequency to be switched to the preselector band to 6.0 (default value).
`SPURious`	Sets the frequency to be switched to the preselector band to 3.0 GHz.

Details

Only `NORMal` can be set in the following conditions:

- When MS2690A is used.
- When the Option 003 pre-selector lower expansion is not installed in the MS2691A/MS2692A.

Example of Use

To set the frequency to be switched to the preselector band to 6.0 GHz.

```
FREQ:BAND:MODE NORM
```

[:SENSe]:FREQuency:BAND:MODE?

Frequency Band Mode Query

Function

This command queries the frequency band path. The frequency at which the path is switched to the preselector band or a path that does not pass through the preselector can be set with this function.

Query

```
[:SENSe]:FREQuency:BAND:MODE?
```

Response

```
<mode>
```

Parameter

<mode>		Frequency band mode
	NORM	Sets the frequency to be switched to the preselector band to 6.0 GHz.
	SPUR	Sets the frequency to be switched to the preselector band to 3.0 GHz.

Example of Use

To query the frequency band path.

```
FREQ:BAND:MODE?
> NORM
```

2.2.4 Sampling Rate

[:SENSe]:FREQuency:SRATe?

Sampling Rate Query

Function

This command queries the sampling rate.

Query

```
[:SENSe]:FREQuency:SRATe?
```

Response

```
<freq>
```

No suffix code. Value is returned in Hz units.

Example of Use

To query the sampling rate.

```
FREQ:SRAT?
> 20000000
```

2.2.5 Reference Level

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

Reference Level

Function

This command sets the reference level.

Command

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

Parameter

<real>		Reference level
	Range	Value equivalent to –120 to +50 dBm (Value equivalent to –120 to +30 dBm when Pre-Amp is On.)
	Resolution	0.01 dB
	Default value	–10 dBm

Example of Use

To set the reference level to 0.00 dBm.

```
DISP:WIND:TRAC:Y:RLEV 0.00DBM
```

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

Reference Level Query

Function

This command queries the reference level.

Query

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

Response

```
<real>
```

Parameter

<real>		Reference level
	Range	Value equivalent to –120 to +50 dBm (Value equivalent to –120 to +30 dBm when Pre-Amp is On)
	Resolution	0.01 dB

Example of Use

To query the reference level.

```
DISP:WIND:TRAC:Y:RLEV?
> 0.00
```

2.2.6 Attenuator Auto

[:SENSe]:POWer[:RF]:ATTenuation:AUTO OFF|ON|0|1

Attenuator Auto

Function

This command enables the automatic attenuation setting function.

Command

```
[:SENSe]:POWer[:RF]ATTenuation:AUTO <switch>
```

Parameter

<switch>	Auto mode On/Off
0|OFF	Off
1|ON	On (default value)

Example of Use

To set the automatic attenuation setting function to On.

```
POW:ATT:AUTO ON
```

[:SENSe]:POWer[:RF]:ATTenuation:AUTO?

Attenuator Auto

Function

This command returns the On/Off state of the automatic attenuation setting.

Query

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

Response

```
<switch>
```

Parameter

<switch>	Auto mode On/Off
0	Off
1	On

Example of Use

To return the On/Off state of the automatic attenuation setting.

```
POW:ATT:AUTO?
> 1
```

2.2.7 Attenuator

[:SENSe]:POWer[:RF]:ATTenuation <rel_ampl>

Attenuator

Function

This command sets the attenuator.

Command

```
[:SENSe]:POWer[:RF]:ATTenuation <rel_ampl>
```

Parameter

`<rel_ampl>`		Attenuator value
	Range	0 to 60 dB
	Resolution	2 dB steps
	Suffix code	`dB`, `DB`
		dB is used when omitted.
	Default value	10 dB

Example of Use

To set the attenuator to 10 dB.

```
POW:ATT 10
```

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

Attenuator Query

Function

This command queries the attenuator.

Query

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

Response

```
<rel_ampl>
```

Parameter

`<rel_ampl>`		Attenuator value
	Range	0 to 60 dB
	Resolution	2 dB steps
		No suffix code. Value is returned in dB units.
	Default value	10 dB

Example of Use

To query the attenuator value.

```
POW:ATT?
> 10
```

2.2.8 Pre Amp

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

Pre-Amp State

Function

This command sets Pre-Amp to On/Off.

Command

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

Parameter

<switch>	Pre-Amp On/Off
OFF|0	Pre-Amp Off (default value)
ON|1	Pre-Amp On

Details

This command is invalid when the Option 008 6 GHz Preamplifier (hereinafter referred to as "Option 008") is not installed.

Example of Use

To set Pre Amp to On.

```
POW:GAIN ON
```

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

Pre-Amp State Query

Function

This command returns the On/Off state of Pre-Amp.

Query

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

Response

```
<switch>
```

Parameter

`<switch>`	Pre-Amp On/Off
`0`	Pre-Amp Off
`1`	Pre-Amp On

Details

0 is returned when the Option 008 is not installed.

Example of Use

To return the On/Off state of Pre-Amp.

```
POW:GAIN?
> 1
```

2.2.9 Level Offset State

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

Level Offset State

Function

This command enables/disables the offset value of the input level.

Command

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

Parameter

<switch>	Level Offset State On/Off
OFF|0	Off (default value)
ON|1	On

Example of Use

To enable the offset value of the input level.

```
DISP:WIND:TRAC:Y:RLEV:OFFS:STAT 1
```

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

Level Offset State Query

Function

This command queries whether the offset value of the input level is enabled/disabled.

Query

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

Response

```
<switch>
```

Parameter

<switch>	Level Offset State On/Off
0	Off (default value)
1	On

Example of Use

To query whether the offset value of the input level is enabled/disabled.

```
DISP:WIND:TRAC:Y:RLEV:OFFS:STAT?
> 1
```

2.2.10 Level Offset

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

Level Offset

Function

This command sets the offset value of the input level.

Command

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

Parameter

<real>		Level Offset
	Range	−99.99 to 99.99 dB
	Resolution	0.01 dB
	Suffix code	dB
		dB is used when omitted.
	Default value	0.00 dB

Example of Use

To set the level offset to 0.50 dB.

```
DISP:WIND:TRAC:Y:RLEV:OFFS 0.5
```

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

Level Offset Query

Function

This command queries the offset value of the input level.

Query

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

Response

```
<real>
```

Parameter

<real>		Level Offset
	Range	−99.99 to 99.99 dB
	Resolution	0.01 dB

Example of Use

To query the level offset setting.

```
DISP:WIND:TRAC:Y:RLEV:OFFS?
> 0.50
```

2.2.11 Trigger Switch

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

Trigger Switch

Function

This command sets the trigger wait to On/Off.

Command

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

Parameter

<switch>	Trigger wait On/Off
OFF|0	Off (default value)
ON|1	On

Example of Use

To set the trigger wait to On.

```
TRIG ON
```

:TRIGger[:SEQuence][:STATe]?

Trigger Switch Query

Function

This command returns the On/Off state of the trigger wait.

Query

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

Response

```
<switch>
```

Parameter

<switch>	Trigger wait On/Off
0	On
1	Off

Example of Use

To return the On/Off state of the trigger wait.

```
TRIG?
> 0
```

2.2.12 Trigger Source

:TRIGger[:SEQuence]:SOURce EXTernal[1]|IMMediate|WIF|RFBurst|VIDeo|SG

Trigger Source

Function

This command selects the trigger signal source.

Command

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

Parameter

`<source>`		Trigger Source
	`EXTernal[1]`	External input (External)
	`IMMediate`	Free run
	`WIF|RFBurst`	Bandwidth IF detection (Wide IF Video)
	`VIDeo`	Video detection (Video) (default value)
	`SG`	SG marker

Details

SG marker trigger can be selected only when the Option 020 Vector Signal Generator (hereinafter referred to as “Option 020”) is installed.

Example of Use

To set the trigger signal source to external input.

```
TRIG:SOUR EXT
```

:TRIGger[:SEQuence]:SOURce?

Trigger Source Query

Function

This command queries the trigger source.

Query

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

Response

```
<source>
```

Parameter

<source>		Trigger Source
	EXT	External input (External)
	IMM	Free run
	WIF	Bandwidth IF detection (Wide IF Video)
	VID	Video detection (Video)
	SG	SG marker

Details

SG marker can be selected only when the Option 020 is installed.

Example of Use

To query the trigger signal source.

```
TRIG:SOUR?
> EXT
```

2.2.13 Trigger Slope

:TRIGger[:SEQuence]:SLOPe POSitive|NEGative

Trigger Slope

Function

This command sets the trigger detection mode (rising/falling).

Command

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

Parameter

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

Example of Use

To detect a trigger at the rising edge.

```
TRIG:SLOP POS
```

:TRIGger[:SEQuence]:SLOPe?

Trigger Slope Query

Function

This command queries the trigger detection mode (rising/falling).

Query

```
:TRIGger[:SEQuence]:SLOPe?
```

Response

```
<mode>
```

Parameter

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

Example of Use

To query the trigger detection mode.

```
TRIG:SLOP?
> POS
```

2.2.14 Trigger Level (Video)

:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic] <level>

Trigger Level (Video)

Function

This command sets the threshold at the level to start the capture against the video trigger in Log scale mode.

Command

```
:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic] <level>
```

Parameter

<level>		Threshold at the level to start the capture
	Range	–150 to +50 dBm
	Resolution	1 dB
	Suffix code	DBM, DM
	Default value	–40 dBm

Example of Use

To set the threshold at the video trigger level in Log scale mode to –10 dBm.

```
TRIG:VID:LEV -10
```

:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic]?

Trigger Level（Video）Query

Function

This command queries the threshold at the level to start the capture against the video trigger in Log scale mode.

Query

```
:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic]?
```

Response

```
<level>
```

Parameter

`<level>` Threshold at the level to start the capture

When the trigger signal source is video detection (Video) and Log scale:

Range	–150 to +50 dBm
Resolution	1 dB
	No suffix code. Value is returned in dBm units.

Example of Use

To query the threshold at the video trigger level in Log scale mode.

```
TRIG:VID:LEV?
> -10
```

2.2.15 Trigger Level (WidelfVideo)

:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute <level>

Trigger Level (Wide IF)

Function

This command sets the threshold at the level to start the capture against the Wide IF Video trigger.

Command

```
:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute <level>
```

Parameter

<level>		Threshold at the level to start the capture
	Range	–60 to 50 dBm
	Resolution	1 dB
	Default value	–20 dBm

Example of Use

To set the threshold of the Wide IF Video trigger level to 10 dBm.

```
TRIG:WIF:LEV:ABS 10
```

:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute?

Trigger Level (Wide IF) Query

Function

This command queries the threshold at the level to start the capture against the Wide IF Video trigger.

Query

```
:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute?
```

Response

```
<level>
```

Parameter

<level>		Threshold at the level to start the capture
	Range	–60 to 50 dBm
	Resolution	1 dB
		No suffix code. Value is returned in dBm units.

Example of Use

To query the threshold of the Wide IF Video trigger level.

```
TRIG:WIF:LEV:ABS?
> 10
```

2.3 Signal Analyzer Function

Table 2.3-1 lists the device messages for invoking the Signal Analyzer functions. The Signal Analyzer functions need to be loaded in advance.

For the commands and queries to be used for control after any of these Signal Analyzer functions is called, refer to the MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Signal Analyzer Function Remote Control).

Table 2.3-1 Invoking of Signal Analyzer Function

Function	Device Message
Configure – Channel Power	`:CONFigure[:FFT]:CHPower`
Configure – Burst Average Power	`:CONFigure[:FFT]:BPOWer|TXPower`
Configure – Extended Digitizing	`:CONFigure:EXTDig`
Configure	`:CONFigure?`

Note:

`FETCh:<measure>`, `INITiate:<measure>`, `READ:<measure>`, and `MEASure:<measure>` cannot be used in this application. The commands and queries can be used in the Signal Analyzer. The Extended Digitizing functions cannot be executed in the Signal Analyzer. The Extended Digitizing function can be executed in this application after `CONFigure:<measure>` has been sent.

The trigger settings, except for the trigger delay setting, are commonly applied. That is, if the triggers are set in the Signal Analyzer after `CONFigure:CHPower` or `CONFigure:BPOWer` has been sent, the same settings are applied to the Extended Digitizing software after CONFigure:EXTDig has been sent. However, even if the trigger delay is set in the Signal Analyzer, it is set to 0 in this application.

:CONFigure[:FFT]:CHPower

Configure-Channel Power

Function

This command selects the Channel Power measurement of the Signal Analyzer function. No measurement is made.

Command

```
:CONFigure[:FFT]:CHPower
```

Example of Use

To select the Channel Power measurement of the Signal Analyzer function.

```
CONF:CHP
```

:CONFigure[:FFT]:BPOWer|TXPower

Configure-Burst Average Power

Function

This command selects the Burst Average Power measurement of the Signal Analyzer function. No measurement is made.

Command

```
:CONFigure[:FFT]:BPOWer|TXPower
```

Example of Use

To select the Burst Average Power measurement of the Signal Analyzer function.

```
CONF:BPOW
```

:CONFigure:EXTDig

Configure-Extended Digitizing

Function

This command selects this application and does not capture any data.

Command

```
:CONFigure:EXTDig
```

Example of Use

To select this application.

```
CONF:EXTD
```

:CONFigure?

Configure Query

Function

This command queries the present function name.

Query

```
:CONFigure?
```

Response

```
<mode>
```

Parameter

<mode>	Function
EXTD	Extended Digitizing

Example of Use

To query the present function name.

```
CONF?
> EXTD
```

2.4 Setting System Parameter

Table 2.4-1 lists device messages for setting system parameters. The parameters apply to this application.

Table 2.4-1 System Parameter Settings

Function	Device Message
Capture Time Length	[:SENSe]:SWEep:TIME <time>
	[:SENSe]:SWEep:TIME?
Capture Count	[:SENSe]:SWEep:COUNt <integer>
	[:SENSe]:SWEep:COUNt?
Capture File Name	[:SENSe]:SWEep:FILE <filename>,<device>
	[:SENSe]:SWEep:FILE?

2.4.1 Capture Time Length

[:SENSe]:SWEep:TIME <time>

Capture Time Length

Function

This command sets the capture time for the waveform.

Command

```
[:SENSe]:SWEep:TIME <time>
```

Parameter

<time>		Capture time
	Range	5 to 14400
	Resolution	1 s
	Suffix code	H, M, S s is used when omitted.

Example of Use

To set the capture time to 1000 seconds.

```
SWE:TIME 1000
```

[:SENSe]:SWEep:TIME?

Capture Time Length Query

Function

This command queries the capture time for the waveform.

Query

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

Response

```
<time>
```

Parameter

<time>		Capture time
	Range	5 to 14400
	Resolution	1 s No suffix code. Value is returned in s units.

Example of Use

To query the capture time.

```
SWE:TIME?
> 1000
```

2.4.2 Capture Count

[:SENSe]:SWEep:COUNt <integer>

Capture Count

Function

This command sets the capture count.

Command

```
[:SENSe]:SWEep:COUNt <integer>
```

Parameter

<integer>		Capture count
	Range	1 to 20
	Resolution	1

Example of Use

To set the capture count.

```
SWE:COUN 10
```

[:SENSe]:SWEep:COUNt?

Capture Count Query

Function

This command queries the capture count.

Query

```
[:SENSe]:SWEep:COUNt?
```

Response

```
<integer>
```

Parameter

<integer>		Capture count
	Range	1 to 20
	Resolution	1

Example of Use

To query the capture count.

```
SWE:COUN?
> 10
```

2.4.3 Capture File Name

[:SENSe]:SWEep:FILE <filename>,<device>

Capture File Name

Function

This command sets the device for storing the waveform data and sets the file name for the waveform data.

Command

```
[:SENSe]:SWEep:FILE <filename>,<device>
```

Parameter

<filename>	File name for waveform data Character string within 29 characters, enclosed in double quotation marks (" ") or single quotation marks (' ')
<device>	Drive name for storing waveform data, such as E and F.

Details

The saved files are stored in the following directory of the specified drive:
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\Extended Digitizing

Example of Use

To set the file name (DATA) of the waveform data in E drive.

```
SWE:FILE "DATA",E
```

[:SENSe]:SWEep:FILE?

Capture File Name Query

Function

This command queries the device for storing the waveform data and queries the file name for the waveform data.

Query

```
[:SENSe]:SWEep:FILE?
```

Response

```
<filename>,<device>
```

Parameter

<filename>	File name Character string within 29 characters, enclosed in double quotation marks (" ") or single quotation marks (' ')
<device>	Drive name: D, E

Details

Waveform data files are stored in the following directory of the specified drive:
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\Extended Digitizing

Example of Use

To query E drive for storing the waveform data and to query the file name (DATA) for the waveform data.

```
SWE:FILE?
> "DATA",E
```

2.5 HDD Utility

Table 2.5-1 lists device messages for setting HDD utility. The parameters apply to this application.

Table 2.5-1 HDD Utility Settings

Function	Device Message
Select Captured File	:MMEMory:IQData <filename>,<device>
	:MMEMory:IQData?
Delete File	:MMEMory:DELete:IQData <filename>,<device>
Delete All Files	:MMEMory:DELete:IQData:ALL <device>
Start Time for Save Captured Data	:MMEMory:STORe:IQData:STARt <time>
	:MMEMory:STORe:IQData:STARt?
Time Length for Save Captured Data	:MMEMory:STORe:IQData:LENGth <time>
	:MMEMory:STORe:IQData:LENGth?
Output Rate for Save Captured Data	:MMEMory:STORe:IQData:RATE <freq>
	:MMEMory:STORe:IQData:RATE?
Divided File Size for Save Captured Data	:MMEMory:STORe:FSIZe <numeric_value>
	:MMEMory:STORe:FSIZe?
Save Captured Data	:MMEMory:STORe:IQData <filename>,<device>
Cancel Execute Save Captured Data	:MMEMory:STORe:IQData:CANCel

2.5.1 Select Captured File

:MMEMory:IQData <filename>,<device>

Select Captured File

Function

This command selects the captured waveform data file.

Command

```
:MMEMory:IQData <filename>,<device>
```

Parameter

<filename>	File name for captured waveform data Character string within 32 characters, enclosed in double quotation marks (" ") or single quotation marks (' ')
<device>	Device name: E , F

Details

If some waveforms are captured, then the first captured waveform data file is automatically selected.
The captured files are stored in the following directory of the specified drive:
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\Extended Digitizing

Example of Use

To select the waveform data file named "DATA".

```
MMEM:IQD "DATA",E
```

:MMEMory:IQData?

Select Captured File Query

Function

This command queries the file name of the captured waveform data.

Query

```
:MMEMory:IQData?
```

Response

```
<filename>,<device>
```

Parameter

`<filename>`	File name for captured waveform data Character string within 32 characters, enclosed in double quotation marks (" ") or single quotation marks (' ')
`<device>`	Device name: E , F

Details

If some waveforms are captured, then the first captured waveform data file is automatically selected.
The captured files are stored in the following directory of the specified drive:
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\Extended Digitizing

Example of Use

To query the file name of the captured waveform data.

```
MMEM:IQD?
> "DATA",E
```

2.5.2 Delete Captured File

:MMEMory:DELete:IQData <filename>,<device>

Delete File

Function

This command selects and deletes the captured waveform data files.

Command

```
:MMEMory:DELete:IQData <filename>,<device>
```

Parameter

<filename>	File name for captured waveform data Character string within 32 characters, enclosed in double quotation marks (" ") or single quotation marks (' ')
<device>	Drive name, such as D and E

Details

The captured files are stored in the following directory of the specified drive:
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\Extended Digitizing

Example of Use

To delete the waveform data file named "DATA" in E drive.

```
MMEM:DEL:IQD "DATA",E
```

:MMEMory:DELete:IQData:ALL <device>

Delete All Files

Function

This command deletes all the captured waveform data files.

Command

```
:MMEMory:DELete:IQData:ALL <device>
```

Parameter

<device>	Drive name, such as D and E

Details

The captured files are stored in the following directory of the specified drive:
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\Extended Digitizing
Up to 1000 files can be stored in the folder.

Example of Use

To delete all the waveform data files in E drive.

```
MMEM:DEL:IQD:ALL E
```

2.5.3 Start Time

:MMEMory:STORe:IQData:STARt <time>

Start Time for Save Captured Data

Function

This command sets the start time for Save Captured Data.

Command

```
:MMEMory:STORe:IQData:STARt <time>
```

Parameter

<time>		Start time
	Range	0 to the maximum value of waveform data – 1 (Max: 14399)
	Resolution	1 s
	Suffix code	H, M, S s is used when omitted.

Details

0 is automatically set to the start time when the captured waveform data file is selected.

Example of Use

To set the start time to 100 seconds.

```
MMEM:STOR:IQD:STAR 100
```

:MMEMory:STORe:IQData:STARt?

Start Time for Save Captured Data Query

Function

This command queries the start time for Save Captured Data.

Query

```
:MMEMory:STORe:IQData:STARt?
```

Response

```
<time>
```

Parameter

`<time>`		Start time
	Range	0 to the maximum value of waveform data – 1 (Max: 14399)
	Resolution	1 s No suffix code. Value is returned in s units.

Details

0 is automatically set to the start time when the captured waveform data file is selected.

Example of Use

To query the start time for Save Captured Data.

```
MMEM:STOR:IQD:STAR?
> 100
```

2.5.4 Time Length

:MMEMory:STORe:IQData:LENGth <time>

Time Length for Save Captured Data

Function

This command sets the time length for Save Captured Data.

Command

```
:MMEMory:STORe:IQData:LENGth <time>
```

Parameter

<time>		Time length
	Range	1 to the maximum value of waveform data (Max: 14400)
	Resolution	1 s
	Suffix code	H, M, S s is used when omitted.

Details

The maximum value is automatically set to the time length when the captured waveform data file is selected.

Example of Use

To set the time length to 1000 seconds.

```
MMEM:STOR:IQD:LENG 1000
```

:MMEMory:STORe:IQData:LENGth?

Time Length for Save Captured Data Query

Function

This command queries the time length for Save Captured Data.

Query

```
:MMEMory:STORe:IQData:LENGth?
```

Response

```
<time>
```

Parameter

`<time>`		Time length
	Range	1 to the maximum value of waveform data (Max: 14400)
	Resolution	1 s No suffix code. Value is returned in s units.

Details

The maximum value is automatically set to the time length when the captured waveform data file is selected.

Example of Use

To query the time length for Save Captured Data.

```
MMEM:STOR:IQD:LENG?
> 1000
```

2.5.5 Output Rate

:MMEMory:STORe:IQData:RATE <freq>

Output Rate for Save Captured Data

Function

This command sets the output rate for Save Captured Data.

Command

```
:MMEMory:STORe:IQData:RATE <freq>
```

Parameter

<freq>		Output rate
	Range	See the table below.
	Resolution	See the table below.
	Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
		Hz is used when omitted.

Frequency Span [Hz]	Minimum [Hz]	Maximum [Hz]	Default Value [Hz]	Resolution [Hz]
100000	100000	200000	200000	1
250000	200000	500000	500000	1
500000	500000	1000000	1000000	10
1000000	1000000	2000000	2000000	10
2500000	2000000	5000000	5000000	10
5000000	5000000	10000000	10000000	100
10000000	10000000	20000000	20000000	100
18600000	10000000	40000000	20000000	100
20000000	12500000	50000000	25000000	100

Details

The default value is automatically set to the output rate when the captured waveform data file is selected.
The setting range is limited by the frequency span of the selected waveform data file.

Example of Use

To set the output rate to 10 MHz.

```
MMEM:STOR:IQD:RATE 10MHZ
```

:MMEMory:STORe:IQData:RATE?

Output Rate for Save Captured Data

Function

This command queries the output rate for Save Captured Data.

Query

```
:MMEMory:STORe:IQData:RATE?
```

Response

```
<freq>
```

Parameter

`<freq>` Output rate

Range See the table below.

Resolution See the table below.

No suffix code. Value is returned in Hz units.

Frequency Span [Hz]	Minimum [Hz]	Maximum [Hz]	Default Value [Hz]	Resolution [Hz]
100000	100000	200000	200000	1
250000	200000	500000	500000	1
500000	500000	1000000	1000000	10
1000000	1000000	2000000	2000000	10
2500000	2000000	5000000	5000000	10
5000000	5000000	10000000	10000000	100
10000000	10000000	20000000	20000000	100
18600000	10000000	40000000	20000000	100
20000000	12500000	50000000	25000000	100

Details

The default value is automatically set to the output rate when the captured waveform data file is selected.
The setting range is limited by the frequency span of the selected waveform data file.

Example of Use

To query the output rate.

```
MMEM:STOR:IQD:RATE?
> 10000000
```

2.5.6 Divided File Size

:MMEMory:STORe:FSIZe <numeric_value>

Divided File Size for Save Captured Data

Function

This command sets the size of the divided files for Save Captured Data.

Command

```
:MMEMory:STORe:FSIZe <numeric_value>
```

Parameter

<numeric_value>	File size
100	100,000,000 bytes (around 95 Mbytes)
200	200,000,000 bytes (around 190 Mbytes)
500	500,000,000 bytes (around 476 Mbytes)
1000	1,000,000,000 bytes (around 953 Mbytes)

Details

If the captured waveform data file is selected, then the file size is initialized to the same size as waveform data saving time length.

Example of Use

To set the size of the divided files.

```
MMEM:STOR:FSIZ 100
```

:MMEMory:STORe:FSIZe?

Divided File Size for Save Captured Data Query

Function

This command queries the size of the divided files for Save Captured Data.

Query

```
:MMEMory:STORe:FSIZe
```

Response

```
<numeric_value>
```

Parameter

<numeric_value>	File size
100	100,000,000 bytes (around 95 Mbytes)
200	200,000,000 bytes (around 190 Mbytes)
500	500,000,000 bytes (around 476 Mbytes)
1000	1,000,000,000 bytes (around 953 Mbytes)

Details

If the captured waveform data file is selected, then the file size is initialized to the same size as waveform data saving time length.

Example of Use

To query the size of the divided files for Save Captured Data.

```
MMEM:STOR:FSIZ?
> 100
```

2.5.7 Save Captured Data

:MMEMory:STORe:IQData <filename>,<device>

Save Captured Data

Function

This command saves the captured waveform data in a file.

Command

```
:MMEMory:STORe:IQData <filename>,<device>
```

Parameter

<filename>	File name for captured waveform data Character string within 27 characters, enclosed in double quotation marks (" ") or single quotation marks (' ')
<device>	Drive name to be saved Drive name, such as D and E

Details

This function can be executed after the captured waveform data file has been selected.
This function can be executed when a waveform is captured in the following conditions:

- Start time for Save Captured Data
- Time length for Save Captured Data
- Output rate for Save Captured Data
- File size for Save Captured Data

Files are saved in the following directory of the specified drive.
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\Signal Analyzer

Example of Use

To save a waveform data file "DATA" into D drive:

```
MMEM:STOR:IQD "DATA",D
```

:MMEMory:STORe:IQData:CANCel

Cancel Execute Save Captured Data

Function

This command cancels saving of waveform data into a file.

Command

```
:MMEMory:STORe:IQData:CANCel
```

Example of Use

To cancel digitizing.

```
MMEM:STOR:IQD:CANC
```

2.6 Utility Function

Table 2.6-1 lists device messages for setting the utility function parameters.

Table 2.6-1 Utility Function

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

2.6.1 Erase Warm Up Message

:DISPlay:ANNotation:WUP:ERASe

Erase Warm Up Message

Function

This command erases the warm up message displayed after startup.

Command

```
:DISPlay:ANNotation:WUP:ERASe
```

Example of Use

To erase the warm up message.

```
DISP:ANN:WUP:ERAS
```

2.6.2 Display Title

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

Display Title

Function

This command displays/hides the title.

Command

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

Parameter

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

Example of Use

To display the title.

```
DISP:ANN:TITL ON
```

:DISPlay:ANNotation:TITLe[:STATe]?

Display Title Query

Function

This command returns the On/Off state of the title display.

Query

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

Response

```
<switch>
```

Parameter

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

Example of Use

To return the On/Off state of the title display.

```
DISP:ANN:TITL?
> 1
```

2.6.3 Title Entry

:DISPlay:ANNotation:TITLe:DATA <string>

Title Entry

Function

This command enters the title character string.

Command

```
:DISPlay:ANNotation:TITLe:DATA <string>
```

Parameter

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

Example of Use

To enter the title character string.

```
DISP:ANN:TITL:DATA 'TEST'
```

:DISPlay:ANNotation:TITLe:DATA?

Title Entry Query

Function

This command queries the title character string.

Query

```
:DISPlay:ANNotation:TITLe:DATA?
```

Response

```
<string>
```

Parameter

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

Example of Use

To query the title character string.

```
DISP:ANN:TITL:DATA?
> TEST
```

2.7 Capturing Waveform

Table 2.7-1 lists device messages for capturing a waveform.

Table 2.7-1 Waveform Capture

Function	Device Message
Initiate	:INITiate[:IMMediate]
	:INITiate:EXTDig
Stop	:STOP[:IMMediate]

2.7.1 Starting/Stopping waveform capture

:INITiate[:IMMediate]

Initiate

Function

This command starts capturing a waveform.

Command

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

Details

You cannot change any parameter while capturing a waveform. If you send a remote command to any software other than this application while capturing a waveform, it prevents capturing the waveform.

Example of Use

To start capturing a waveform.

```
INIT
```

:INITiate:EXTDig

Initiate

Function

This command starts capturing a waveform.

Command

```
:INITiate:EXTDig
```

Details

You cannot change any parameter while capturing a waveform. If you send a remote command to any software other than this application while capturing a waveform, it prevents capturing the waveform.

Example of Use

To start capturing a waveform.

```
INIT:EXTD
```

:STOP[:IMMediate]

Stop

Function

This command stops capturing the waveform.

Command

```
:STOP:[IMMediate]
```

Details

When you stop capturing the waveform, the IQ data already captured remains.

Example of Use

To stop capturing the waveform.

```
STOP
```

Chapter 3 SCPI Status Register

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

3.1 Querying Status 3-2
3.2 STATus:QUEStionable Register..... 3-4
3.3 STATus:OPERation Register 3-15

3.1 Querying Status

:STATus:ERRor?

Status Query

Function

This command queries the status.

Query

```
:STATus:ERRor?
```

Response

```
<status>
```

Parameter

`<status>` Status

Value = bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6 + bit7 + bit8 + bit9 + bit10 + bit11 + bit12 + bit13 + bit14 + bit15

bit0: 2^0 = 1	Not measured
bit1: 2^1 = 2	Exceeded the level.
bit2: 2^2 = 4	Memory buffer is full
bit3: 2^3 = 8	Capacity over
bit4: 2^4 = 16	No device
bit5: 2^5 = 32	(Unused)
bit6: 2^6 = 64	(Unused)
bit7: 2^7 = 128	(Unused)
bit8: 2^8 = 256	(Unused)
bit9: 2^9 = 512	(Unused)
bit10: 2^{10} = 1024	(Unused)
bit11: 2^{11} = 2048	(Unused)
bit12: 2^{12} = 4096	(Unused)
bit13: 2^{13} = 8192	(Unused)
bit14: 2^{14} = 16384	(Unused)
bit15: 2^{15} = 32768	(Unused)

Range 0 to 255

Details

"Not measured" is set to 1 while capturing a waveform. It is set to 0 during normal termination of capturing. When capturing is stopped, it is set to 0 if capturing could be done normally until it was stopped.
"Memory buffer is full" states the case where the internal memory enters a full state and no more data can be captured. "Capacity over" states the case where the HDD is out of free space. No device states the case where no external HDD has been selected.

Example of Use

To query the measurement status.

```
:STAT:ERR?
> 0
```

3.2 STATus:QUEStionable Register

Figures 3.2-1, 3.2-2, and Tables 3.2-1,3.2-2 show the layer structure of the QUEStionable Status Register.

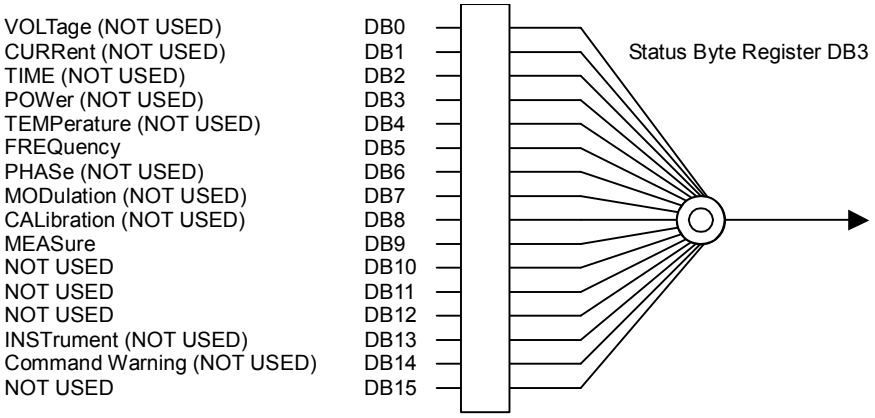

Figure 3.2-1 QUEStionable Status Register

Table 3.2-1 Bit Definition of QUEStionable Status Register

Bit	Definition
DB5	Unlock of Reference Clock
DB9	QUEStionable Measure Register Summary

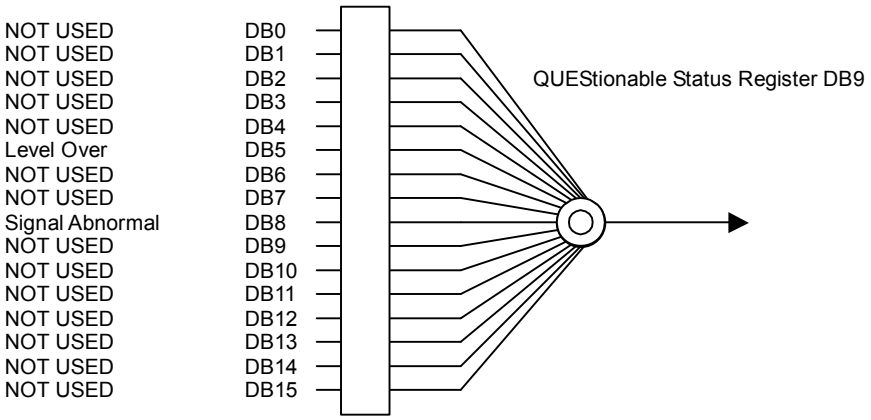

Figure 3.2-2 QUEStionable Measure Register

Table 3.2-2 Bit Definition of QUEStionable Measure Register

Bit	Definition
DB5	Exceeded the level.

Table 3.2-3 lists device messages for 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 the event register of the QUEStionable Status Register.

Query

```
:STATus:QUEStionable[:EVENt]?
```

Response

```
<integer>
```

Parameter

`<integer>`	Bit summation of Event Register
Resolution	1
Range	0 to 65535

Example of Use

To query the event register of the QUEStionable Status Register.

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

:STATus:QUEStionable:CONDition?

Questionable Status Register Condition

Function

This command queries the condition register of the QUEStionable Status Register.

Query

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

Response

```
<integer>
```

Parameter

`<integer>`		Bit summation of Condition Register
	Resolution	1
	Range	0 to 65535

Example of Use

To query the condition register of the QUEStionable Status Register.

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

:STATus:QUEStionable:ENABle <integer>

Questionable Status Register Enable

Function

This command sets the event enable register of the QUEStionable Status Register.

Command

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

Parameter

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

Example of Use

To set 16 to the event enable register of the QUEStionable Status Register.

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

:STATus:QUEStionable:ENABle?

Questionable Status Register Enable Query

Function

This command queries the event enable register of the QUEStionable Status Register.

Query

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

Response

```
<integer>
```

Parameter

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

Example of Use

To query the event enable register of the QUEStionable Status Register.

```
:STAT:QUES:ENAB?
> 16
```

:STATus:QUEStionable:NTRansition <integer>

Questionable Status Register Negative Transition

Function

This command sets the transition filter (negative transition) of the QUEStionable Status Register.

Command

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

Parameter

<integer>		Bit summation of Transition Filter (negative transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To set 16 to the transition filter (negative transition) of the QUEStionable Status register.

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

:STATus:QUEStionable:NTRansition?

Questionable Status Register Negative Transition Query

Function

This command queries the transition filter (negative transition) of the QUEStionable Status Register.

Query

```
:STATus:QUEStionable:NTRansition?
```

Response

```
<integer>
```

Parameter

<integer>		Bit summation of Transition Filter (negative transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To query the transition filter (negative transition) of the QUEStionable Status register.

```
:STAT:QUES:NTR?
> 16
```

:STATus:QUEStionable:PTRansition <integer>

Questionable Status Register Positive Transition

Function

This command sets the transition filter (Positive transition) of the QUEStionable Status Register.

Command

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

Parameter

<integer>		Bit summation of Transition Filter (positive transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To set 16 to the transition filter (positive transition) of the QUEStionable status register.

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

:STATus:QUEStionable:PTRansition?

Questionable Status Register Positive Transition Query

Function

This command queries the transition filter (positive transition) of the QUEStionable Status Register.

Query

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

Response

```
<integer>
```

Parameter

<integer>		Bit summation of Transition Filter (positive transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To query the transition filter (positive transition) of the QUEStionable Status Register.

```
:STAT:QUES:PTR?
> 16
```

:STATus:QUEStionable:MEASure[:EVENt]?

Questionable Measure Register Event

Function

This command queries the event register of the QUEStionable Measure Register.

Query

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

Response

```
<integer>
```

Parameter

<integer>		Bit summation of Event Register
	Resolution	1
	Range	0 to 65535

Example of Use

To query the contents of the event register of the QUEStionable Measure Register.

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

:STATus:QUEStionable:MEASure:CONDition?

Questionable Measure Register Condition

Function

This command queries the condition register of the QUEStionable Measure Register.

Query

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

Response

```
<integer>
```

Parameter

<integer>		Bit summation of Condition Register
	Resolution	1
	Range	0 to 65535

Example of Use

To query the contents of the condition register of the QUEStionable Measure Register.

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

:STATus:QUEStionable:MEASure:ENABle <integer>

Questionable Measure Register Enable

Function

This command sets the event enable register of the QUEStionable Measure Register.

Command

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

Parameter

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

Example of Use

To set 16 to the event enable register of the QUEStionable Measure Register.

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

:STATus:QUEStionable:MEASure:ENABle?

Questionable Measure Register Enable Query

Function

This command queries the event enable register of the QUEStionable Measure register.

Query

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

Response

```
<integer>
```

Parameter

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

Example of Use

To query the event enable register of the QUEStionable Measure Register.

```
:STAT:QUES:ENAB?
> 16
```

:STATus:QUEStionable:MEASure:NTRansition <integer>

Questionable Measure Register Negative Transition

Function

This command sets the transition filter (negative transition) of the QUEStionable Measure Register.

Command

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

Parameter

<integer>		Bit summation of Transition Filter (negative transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To set 16 to the transition filter (negative transition) of the QUEStionable Measure Register.

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

:STATus:QUEStionable:MEASure:NTRansition?

Questionable Measure Register Negative Transition Query

Function

This command queries the transition filter (negative transition) of the QUEStionable Measure Register.

Query

```
:STATus:QUEStionable:MEASure:NTRansition?
```

Response

```
<integer>
```

Parameter

<integer>		Bit summation of Transition Filter (negative transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To query the transition filter (negative transition) of the QUEStionable Measure Register.

```
:STAT:QUES:NTR?
> 16
```

:STATus:QUEStionable:MEASure:PTRansition <integer>

Questionable Measure Register Positive Transition

Function

This command sets the transition filter (positive transition) of the QUEStionable Measure Register.

Command

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

Parameter

<integer>		Bit summation of Transition Filter(positive transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To set 16 to the transition filter (positive transition) of the QUEStionable Measure register.

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

:STATus:QUEStionable:MEASure:PTRansition?

Questionable Measure Register Positive Transition Query

Function

This command queries the transition filter (positive transition) of the QUEStionable Measure register.

Query

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

Response

```
<integer>
```

Parameter

<integer>		Bit summation of Transition Filter (positive transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To query the transition filter (positive transition) of the QUEStionable Measure register.

```
:STAT:QUES:PTR?
> 16
```

3.3 STATus:OPERation Register

Figure 3.3-1 and Table 3.3-1 show the layer structure of the OPERation Status Register.

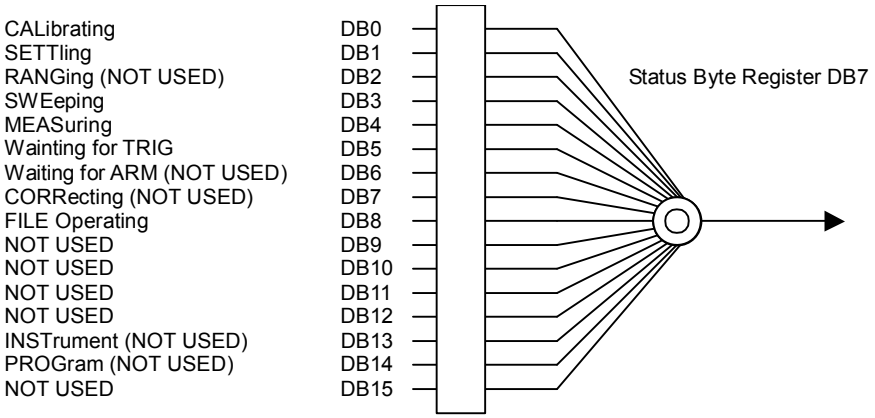

Figure 3.3-1 OPERation Status Register

Table 3.3-1 Definition of OPERation Status Register

Bit	Definition
DB0	CAL is in execution.
DB1	Warm Up message is being displayed.
DB3	During capture (1 is returned in Continuous mode.)
DB5	Waiting for trigger
DB8	File is in operation.

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

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 the event register of the OPERation Status Register.

Query

```
:STATus:OPERation[:EVENt]?
```

Response

```
<integer>
```

Parameter

`<integer>`		Bit summation of Event Register
	Resolution	1
	Range	0 to 65535

Example of Use

To query the event register of the OPERation Status Register.

```
:STAT:OPER?
> 0
```

:STATus:OPERation:CONDition?

Operation Status Register Condition

Function

This command queries the condition register of the OPERation Status Register.

Query

```
:STATus:OPERation:CONDition?
```

Response

```
<integer>
```

Parameter

`<integer>`		Bit summation of Condition Register
	Resolution	1
	Range	0 to 65535

Example of Use

To query the condition register of the OPERation Status Register.

```
:STAT:OPER:COND?
> 0
```

:STATus:OPERation:ENABle <integer>

Operation Status Register Enable

Function

This command sets the event enable register of the OPERation Status Register.

Command

```
:STATus:OPERation:ENABle <integer>
```

Parameter

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

Example of Use

To set 16 to the event enable register of the OPERation Status Register.

```
:STAT:OPER:ENAB 16
```

:STATus:OPERation:ENABle?

Operation Status Register Enable Query

Function

This command queries the event enable register of the OPERation Status Register.

Query

```
:STATus:OPERation:ENABle?
```

Response

```
<integer>
```

Parameter

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

Example of Use

To query the event enable register of the OPERation Status Register.

```
:STAT:OPER:ENAB?
> 16
```

:STATus:OPERation:NTRansition <integer>

Operation Status Register Negative Transition

Function

This command sets the transition filter (negative transition) of the OPERation Status Register.

Command

```
:STATus:OPERation:NTRansition <integer>
```

Parameter

<integer>		Bit summation of Transition Filter (negative transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To set 16 to the transition filter (negative transition) of the OPERation Status Register.

```
:STAT:OPER:NTR 16
```

:STATus:OPERation:NTRansition?

Operation Status Register Negative Transition Query

Function

This command queries the transition filter (negative transition) of the OPERation Status Register.

Query

```
:STATus:OPERation:NTRansition?
```

Response

```
<integer>
```

Parameter

<integer>		Bit summation of Transition Filter (negative transition)
	Resolution	1
	Range	0 to 65535

Example of Use

To query the transition filter (negative transition) of the OPERation Status Register.

```
:STAT:OPER:NTR?
> 16
```

:STATus:OPERation:PTRansition <integer>

Operation Status Register Positive Transition

Function

This command sets the transition filter (positive transition) of the OPERation Status Register.

Command

```
:STATus:OPERation:PTRansition <integer>
```

Parameter

<integer>	Bit summation of Transition Filter(positive transition)
Resolution	1
Range	0 to 65535

Example of Use

To set 16 to the transition filter (positive transition) of the OPERation Status Register.

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

:STATus:OPERation:PTRansition?

Operation Status Register Positive Transition Query

Function

This command queries the transition filter (positive transition) of the OPERation Status Register.

Query

```
:STATus:OPERation:PTRansition?
```

Response

```
<integer>
```

Parameter

<integer>	Bit summation of Transition Filter (positive transition)
Resolution	1
Range	0 to 65535

Example of Use

To query the transition filter (positive transition) of the OPERation Status Register.

```
:STAT:OPER:PTR?
> 16
```