

Keysight X-Series Signal Analyzers

This manual provides documentation for the following analyzers, with N9062A, W9062A or N9062EMOD applications installed:

PXA Signal Analyzer N9030A

MXA Signal Analyzer N9020A

EXA Signal Analyzer N9010A

CXA Signal Analyzer N9000A

MXE EMI Receiver N9038A

SCPI
Language
Compatibility
Guide

Notices

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1 Getting Started

This chapter provides a quick overview of the SCPI Language Compatibility Measurement Application (hereinafter referred to as "the SCPI LC Application") on Keysight X-series analyzers.

What Does the Keysight SCPI LC Application Do?

The Keysight SCPI LC application is designed to allow X-Series signal analyzers (including CXA, EXA, MXA and PXA) to be controlled using the SCPI programming commands (as known as SCPI commands, or SCPI) from the following Rohde & Schwarz (R&S) instruments:

- R&S FSE
- R&S FSP
- R&S FSU
- R&S ESU
- R&S FSV
- R&S FSL

An X-Series analyzer with the SCPI LC Application installed is able to emulate the FSE, FSP, FSU, ESU, FSV, FSL measurement functions as closely as possible in many automated systems with minimal or no modification to the currently used measurement software.

The SCPI LC Application supports over 300 SCPI commands from the FSE/FSP/FSU/ESU/FSV/FSL instruments and 16 of IEEE488.2 standard SCPI commands.

NOTE

The SCPI LC Application supports commands from the Spectrum Analyzer (default) mode. Commands from other options or modes are not supported.

The SCPI LC Application does not support the same front panel operations, user interface and measurement screen display as the FSE, FSP, FSU, ESU, FSV, FSL instruments.

The SCPI LC Application does not support the Split Screen feature.

The SCPI LC Application partly supports Channel Power measurements, OBW measurements, ACP measurements and IQ traces.

Documentation for the SCPI LC Application

Signal Analyzers with the SCPI LC Application

The latest documentation for this application may be downloaded from the Keysight web site. For more details, see [“Where to Find the Latest Information” on page 3](#).

This document is not designed to be a comprehensive guide to all SCPI commands. It gives brief descriptions of the supported commands, and highlights important functional or behavioral differences that you should be aware of when transferring your existing code to an X-Series analyzer. For a complete description of these SCPI commands, refer to the manuals supplied with your original analyzer.

Signal Analyzer Updates

For the latest information about this instrument, including software upgrades, application information, and product information, see [“Is your product software up-to-date?” on page 3](#).

SCPI Language Compatibility Application General Rules and Limitations

The SCPI LC Application has been designed to emulate the remote operation of the R&S FSE/FSP/FSU/ESU/FSV/FSL instruments for the most commonly used commands needed for basic spectrum analyzer functions. It is not an absolute direct replacement for these instruments in all cases, and does not support instrument modes beyond the core spectrum analyzer. It also does not emulate the local front-panel interface (buttons) and display as used for manual operation.

Couplings

The SCPI LC Application uses the auto coupling features of the X-Series analyzers, and may be slightly different from the FSE/FSP/FSU/ESU/FSV/FSL. To eliminate the possibilities of "Meas Uncal" errors between auto and manual values, values will default to the X-Series auto settings where applicable (for example resolution bandwidth).

The parameter's default value is adjusted to match that of the FSE/FSP/FSU/ESU/FSV/FSL unless otherwise stated.

Data Formats

The SCPI LC Application supports data formats defined for the X-Series analyzers. For more information, see *SA Programmer's Guide*.

Markers

The SCPI LC Application emulates the behavior of FSE/FSP/FSU/ESU/FSV/FSL instruments.

Numeric Ranges

Numeric ranges are limited to that of the X-Series analyzers unless otherwise stated. For more information about X-Series numeric ranges, see *SA Programmer's Guide*.

Remote Control

The SCPI LC Application in X-Series signal analyzers supports remote operation through the following interfaces: GPIB, LAN, USB or Telnet.

Returning Data

Data returned in response to a command or query is defined in [Chapter 3, "Compatible SCPI Commands"](#), on page 50, unless otherwise stated. For more information about X-Series data returning, see *SA Programmer's Guide*.

The data returned from queries, especially from a trace query, match the FSE/FSP/FSU/ESU/FSV/FSL for the most common data formats (ASCII, Binary 32).

Units

The SCPI LC Application supports the following standard units. Any units supported by FSE/FSP/FSU/ESU/FSV/FSL commands that are not supported by the application are noted in the table and details found in [Chapter 3, “Compatible SCPI Commands”, on page 50](#).

Frequency Units: HZ, KHZ, MHZ, GHZ

Amplitude Units: DB, DBM, DBUV, DBMV, DBUA, V, A, W

Time Units: KS, S, MS, US, NS

Status System & SRQ

The STATus subsystem is a remote-only command structure that allows a controller to determine the operating status of the instrument. The system can also allow the instrument to request service from the controller on an interrupt basis. The system is a complex hierarchy, where specific details of an instrument's condition are summarized upward to higher level registers. The use of this system is optional, and your programs may vary widely in the depth to which you use it.

The topmost Status Byte Register, Standard Event Status Register, and their SRQ behavior, are specified by IEEE 488.2 standard. The SCPI LC Application adopts the Status system of the Keysight X-Series analyzers, which conforms to the IEEE 488.2 standard and behaves like that of any IEEE488.2-compliant instrument. These status conditions, events, or commands should emulate any compliant instrument, for example:

- operation complete, *OPC and *OPC?
- Status Byte bits, including Error/Event reporting, plus *CLS, *STB
- Standard Event Status Register bits, plus *ESE, *ESR, *PSC
- SRQ behavior and *SRE mask
- most error conditions (top level), plus STATus:QUEue? and SYSTem:ERRor? queries
- use of STATus:OPERation and STATus:QUESTionable commands, although specific bits may be mapped differently

At lower levels of details, different vendors have implemented their status systems differently. Therefore, if a program (written for FSE/FSP/FSU) makes deep or sophisticated use of the status subsystem, it may not run correctly with the SCPI LC Application and so require modification. The top differences include (but are not limited to) the following:

- RF & IF Overload condition
- parallel polling, IST-flag (Individual Status), and PPE (Parallel Poll Enable) mask
- limit or limit margin mask failure reporting
- sweep break feature (of a multi-sweep measurement)
- specific error message numbers, specific error message text
- status conditions associated with Screen B (specifically)

For more information about the X-Series Status system, see *SA Programmer's Guide*.

Supported Commands and Queries

Only a subset of the FSE/FSP/FSU/ESU/FSV/FSL series commands is supported in the SCPI LC Application. The list of supported commands was determined by feedback from our customers combined with technical considerations and constraints.

The supported FSE/FSP/FSU/ESU/FSV/FSL commands are listed in the [Chapter , "List of SCPI Commands"](#). In some cases, a command is accepted without error, but no action taken, for example, a display line.

Unsupported Commands and Queries

If a command or query is valid for FSE/FSP/FSU/ESU/FSV/FSL products but not supported by the SCPI LC Application, the X-Series analyzer may handle it in the following way:

- Generate an error message. This kind of SCPI commands is not covered in this manual.

NOTE

If your use case is not fully supported, contact your local Keysight Technologies Sales and Service Office, or if in the United States, call 1-800-829-4444.

Hardware and Firmware Requirements for the SCPI LC Application

One of the following Keysight signal analyzers is required to run the SCPI LC Application.

Analyzer Model Number	Upper Frequency Limit	Firmware
N9030A-503	3.6 GHz	Rev A.06.00 or later
N9030A-508	8.4 GHz	Rev A.06.00 or later
N9030A-513	13.6 GHz	Rev A.06.00 or later
N9030A-526	26.5 GHz	Rev A.06.00 or later
N9030A-543	43 GHz	Rev A.08.00 or later
N9030A-544	44 GHz	Rev A.08.00 or later
N9030A-550	50 GHz	Rev A.08.00 or later

Analyzer Model Number	Upper Frequency Limit	Firmware
N9020A-503	3.6 GHz	Rev A.06.00 or later
N9020A-508	8.4 GHz	Rev A.06.00 or later
N9020A-513	13.6 GHz	Rev A.06.00 or later
N9020A-526	26.5 GHz	Rev A.06.00 or later

Analyzer Model Number	Upper Frequency Limit	Firmware
N9010A-503	3.6 GHz	Rev A.06.00 or later
N9010A-507	7 GHz	Rev A.06.00 or later
N9010A-513	13.6 GHz	Rev A.06.00 or later
N9010A-526	26.5 GHz	Rev A.06.00 or later

Analyzer Model Number	Upper Frequency Limit	Firmware
N9000A-503	3 GHz	Rev A.10.01 or later
N9000A-507	7.5 GHz	Rev A.10.01 or later

For maximum compatibility, you should select an X-Series analyzer that equals or exceeds the frequency range of the FSE/FSP/FSU analyzer you are replacing.

Installing the SCPI LC Application

The SCPI LC application for the R&S FSE/FSP/FSU/ESU/FSV/FSL analyzers is a licensed application on the X-Series analyzers. The application must be installed and licensed on the X-Series analyzer for it to work correctly.

License for the SCPI LC Application

One of the following licenses is required to provide SCPI language compatibility on Keysight X-Series analyzers:

- N9062A-2FP
- W9062A-2FP
- N9062EM0D

Installation

The license is installed on the X-Series analyzer in one of the following ways:

- If you purchased a new X-Series analyzer with the SCPI LC Application, then the product is installed and licensed and ready to use.
- If you have an X-Series analyzer and have subsequently purchased the SCPI LC Application, then you can download the the SCPI LC Application from the Keysight website. The SCPI LC Application is installed as part of a software upgrade. See the link below for Signal Analyzers software upgrade site. After upgrading your software you should then use your entitlement certificate to license the product (see [Licensing](#) below).

The latest revision of the software may be downloaded from:

http://www.keysight.com/find/pxa_software

http://www.keysight.com/find/mxa_software

http://www.keysight.com/find/exa_software

http://www.keysight.com/find/cxa_software

NOTE

No calibration is required after the SCPI LC Application is installed.

Licensing

When you order a licensed product, you receive an entitlement certificate. Instructions are provided on your entitlement certificate to direct you to the Web site to redeem your certificate for a license key. You need to provide your instrument product number and serial number, and the entitlement certificate number.

Required Information:	Front Panel Key Path:
Model #: (Ex. N9020A)	
Instrument	System > Show > System
Serial Number:	

The license is downloaded from the license website onto a USB storage device so that it can be loaded into the instrument.

A license key is usually for one instrument model/serial number combination. The license key can only be installed on that instrument.

License Installation Procedure over USB

1. Redeem the Option Upgrade Entitlement Certificate by following the instructions on the Certificate.
2. After redeeming your Option Upgrade Entitlement Certificate you will receive an e-mail with an attached License File.
3. Locate a USB storage device and save the .lic file to the root directory of the USB storage device.
4. Connect the USB storage device to one of the signal analyzer USB ports. Windows detects the new hardware and may display the configuration menu. This menu may be configured according to your preferences.
5. The signal analyzer automatically consumes the license file. (This may take a few minutes) When the license is consumed the Keysight License Manager displays a "Successful License Installation" message.
6. Alternatively the license file can be manually installed over USB or LAN by placing the license file in the following folder on the signal analyzer.
C:\Program Files\Keysight\licensing

Verify the Installation

1. Press **System > Show > System** to display the list of installed applications.
2. Verify that the new application appears in the list.

If you require further assistance, please contact the Keysight support team.

Online assistance: <http://www.keysight.com/find/assist>

Getting Started
Installing the SCPI LC Application

If you do not have access to the Internet, contact your local Keysight Technologies Sales and Service Office, or if in the United States, call 1-800-829-4444.

Running Software that Requires SCPI Commands

You only have access to a subset of SCPI commands from FSE/FSP/FSU/ESU/FSV/FSL instruments. The SCPI commands supported by X-Series analyzers are listed in [“List of SCPI Commands” on page 15](#).

If you are not familiar with the SCPI language, [Chapter 4, “A Brief Introduction to the SCPI Language”, on page 188](#) contains some useful information.

Service and Calibration

Since the Performance Verification and Adjustment Software uses the SCPI command language, you need to exit the SCPI LC Application and change to the Spectrum Analyzer application prior to calibration or service of your Keysight X-Series analyzer.

2 Front Panel Operations

This chapter describes the available front panel operations that are supported by the SCPI LC Application on the Keysight X-series analyzers.

Selecting SCPI Language Compatibility Mode

To select the SCPI Language Compatibility mode, press the **Mode** hardkey on the X-Series analyzer front panel and then select the **SCPI Language Compatibility** mode. If there are more than six modes on the signal analyzer, then use the More button to find the **SCPI Language Compatibility** mode selection. [Figure 2-1](#) is an example mode menu map showing the SCPI LC Application installed.

Figure 2-1 Example Mode Menu Map for X-Series Analyzers



NOTE

This Mode selection is available only if a license for the SCPI LC Application has been installed in the instrument. For more information, see [“Installing the SCPI LC Application” on page 36](#).

Alternatively, you can select this mode using following SCPI commands.

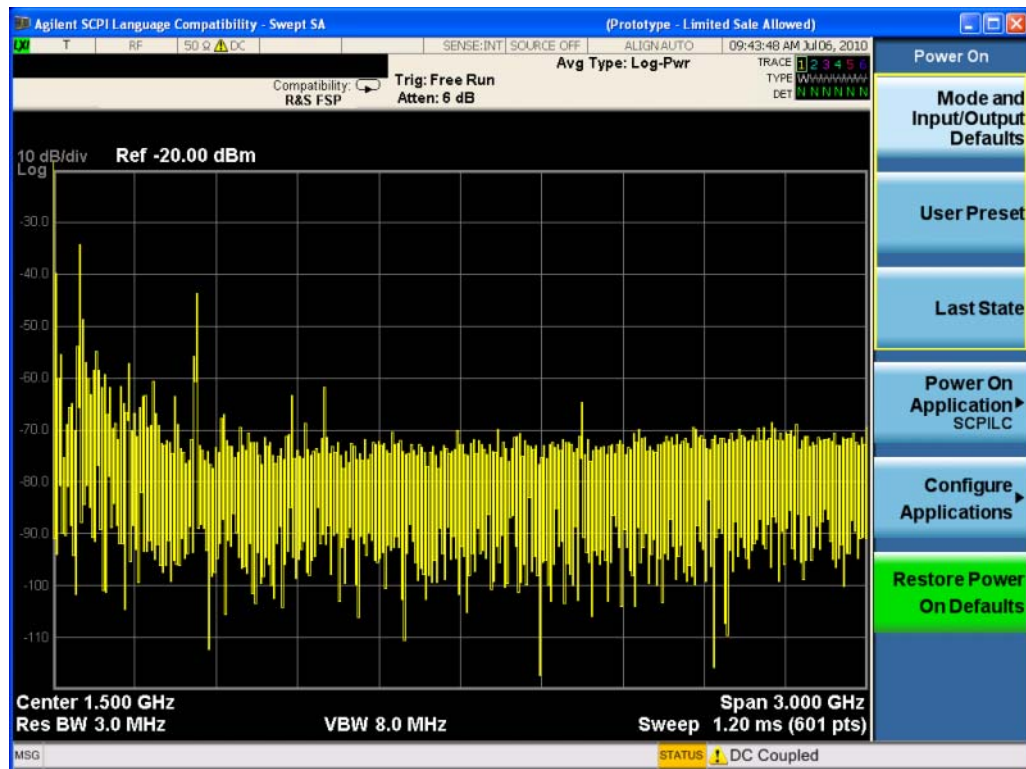
Key Path:	Front-panel key
Remote Command	<code>:INST SCPIRLC</code> <code>:INST:NSElect 270</code>
Initial S/W Revision:	A.06.00 or later

Selecting SCPI Language Compatibility Mode as the Power-on Application

To select the SCPI Language Compatibility mode as the power-on application, press the **System** hardkey on the X-Series analyzer front panel and then select the **Power On, SCPI LC**. If there are more than six modes on the signal analyzer, then use the More button to find the **SCPI LC** mode selection. Figure 2-2 is an example showing the power-on application setup.

Figure 2-2

Example Power On Mode Menu Map for X-Series Analyzers



Mode Setup Menu

The controls in this menu allow you to adjust the mode setup configuration for selected mode.

Key Path:	Front-panel key
Initial S/W Revision:	A.06.00 or later

Compatibility Model

To select the compatibility model you wish to emulate, press the **Mode Setup** hardkey on the front panel and then press **Compatibility Model**. The menu allows you to select the Compatibility Mode from FSE/FSP/FSU/ESU/FSV/FSL.

NOTE

When the **Mode IDN Response** selects Compatibility Model, it does not affect the response to the command “ID?” which always returns the model number of your X-Series analyzer, like “N9020A”.

The selected compatibility model determines the response to the “IDN?” command. Setting the Compatibility Model affects the response to the SCPI command “*IDN?”. This command returns the model number and firmware version number of the corresponding instrument.

Alternatively, you can select the desired compatibility mode using the following SCPI command.

The query returns the model currently being emulated.

Key Path	Mode Setup
Remote Command	[:SENSe] :RLC :TYPE FSE FSP FSU ESU FSL FSV [:SENSe] :RLC :TYPE ?
Example	SENS:RLC:TYPE FSU RLC:TYPE?
State Saved	PON
Range	FSE FSP FSU ESU FSL FSV
Initial S/W Revision	A.06.00

R&S FSE

Selects emulation of FSE.

Key Path:	Mode Setup, Compatibility Model
Example:	RLC:TYPE FSE
Initial S/W Revision:	A.06.00 or later

R&S FSP

Selects emulation of FSP.

Key Path:	Mode Setup, Compatibility Model
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Example:	RLC:TYPE FSP
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Initial S/W Revision:	A.06.00 or later
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R&S FSU

Selects emulation of FSU.

Key Path:	Mode Setup, Compatibility Model
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Example:	RLC:TYPE FSU
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Initial S/W Revision:	A.06.00 or later
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R&S ESU

Selects emulation of the R&S ESU

Key Path	Mode Setup, Compatibility Model
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Example	RLC:TYPE ESU
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Initial S/W Revision	A.06.00
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R&S FSL

Selects emulation of the R&S FSL

Key Path	Mode Setup, Compatibility Model
----------	--

Example	RLC:TYPE FSL
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Initial S/W Revision	A.21.00
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R&S FSV

Selects emulation of the R&S FSV

Key Path	Mode Setup, Compatibility Model
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Example	RLC:TYPE FSV
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Initial S/W Revision	A.21.00
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Mode IDN Response

NOTE

This selection is active only within the SCPI Language Compatibility mode.

To select the response to the command '*IDN?', press the **Mode Setup** hardkey on the front panel and then press **Mode IDN Response**.

NOTE

The **System IDN Response** selection refers back to the system-level IDN response as selected under the **System** key (either **Factory** or **User**). These selections apply to the entire instrument, across all modes.

Alternatively, you can select the desired response using the following SCPI command.

Key Path	Mode Setup
Remote Command	[:SENSe]:RLC:IDN:TYPE SYSTem COMPatibility USER [:SENSe]:RLC:IDN:TYPE?
Example	SENS:RLC:IDN:TYPE SYSTem RLC:IDN:TYPE?
State Saved	PON
Range	SYSTem COMPatibility USER
Initial S/W Revision	A.06.00

Compatibility Model

Sets the response to the *IDN command to be a string describing the emulated instrument, such as "FSP".

Key Path	Mode Setup, Mode IDN Response
Example	RLC:IDN:TYPE COMP
Initial S/W Revision	A.06.00

System IDN Response

Sets the response to the *IDN command to be a string describing the analyzer model, such as "N9020A".

Key Path	Mode Setup, Mode IDN Response
Example	RLC:IDN:TYPE SYST
Initial S/W Revision	A.06.00

User IDN Response

Allows you to set or query the user-defined mode IDN response.

This setting affects the response string of "*IDN?", and the whole SCPI tree, according to the current selection.

The query returns the current User IDN Response string, unless the string is empty, in which case the System IDN Response is returned instead.

Key Path	Mode Setup
Remote Command	[:SENSe]:RLC:IDN:USER <string> [:SENSe]:RLC:IDN:USER?
Example	SENS:RLC:IDN:USER "abc" RLC:IDN:USER?
State Saved	PON
Initial S/W Revision	A.06.00

Restore Mode Defaults

Resets the state for the currently active mode by resetting the mode persistent setting to their default values and by performing a mode preset. This function will never cause a mode switch. This function performs a full preset on the active mode.

Preferences

This menu includes some special settings that are usually in response to special requests.

Band Type FFT

When it is ON, FFT can be available depends on the configuration or the user's selection.

When it is OFF, FFT won't be enabled in any case even if "BAND:TYPE FFT" is received.

Key Path	Mode Setup, Preferences
Preset	On
State Saved	PON
Range	ON OFF
Initial S/W Revision	A.16.00

Max FFT Width

Limits FFT max width.

When it is AUTO, the SCPI LC application will use the auto calculated MAX FFT width.

When it is any selection other than AUTO, if the auto calculated MAX FFT width is larger the selection, the SCPI LC application will use the selection as the FFT max width.

Key Path	Mode Setup, Preferences
Preset	AUTO
State Saved	PON
Range	AUTO <4.01 kHz <28.81 kHz <167.4kHz <411.9kHz ≤7.99 MHz ≤10.00 MHz ≤25.00 MHz ≤40.00 MHz ≤160.00 MHz
Initial S/W Revision	A.16.00
Note	The “25.00 MHz”, “≤40.00 MHz” and “≤160.00 MHz” depends on the HW capabilities.

Config Error Report

The settings in this menu enable/disable “SYST:ERR?” responses for some specific errors.

Invalid Character

Enables/Disables invalid character error report for “SYST:ERR?”.

When it is OFF, “SYST:ERR?” won’t return “Invalid Character” error if the SCPI command contains any invalid character, for example, “FREQ:%CENT 1GHZ”.

Key Path	Mode Setup, Preferences, Config Error Report
Preset	On
State Saved	PON
Range	ON OFF
Initial S/W Revision	A.16.00

Data Out Of Range

Enables/Disables data out of range error report for “SYST:ERR?”.

When it is OFF, “SYST:ERR?” does not return “Data Out Of Range” error if the parameter of the SCPI command is out of range, for example, “BAND -10MHZ”.

Key Path	Mode Setup, Preferences, Config Error Report
Preset	On
State Saved	PON
Range	ON OFF
Initial S/W Revision	A.16.00

Send Commands

After you finish setting up the SCPI LC Application, you can send FSE/FSP/FSU/ESU/FSV/FSL commands to X-Series analyzers.

It is recommended to use Keysight 82357B USB/GPIB interface and free instrument to PC connection tool Keysight IO Libraries Suite when you connect the instrument to a PC. For more details, visit:

<http://www.keysight.com/find/82357B>

<http://www.keysight.com/find/iolib>

NOTE

The commands can be sent via a GPIB, LAN, USB, or Telnet connection that your X-Series analyzer can support.

3 Compatible SCPI Commands

This chapter lists the IEEE standard SCPI commands and the FSE/FSP/FSU/ESU/FSV/FSL SCPI commands that are supported by the SCPI LC Application on the Keysight X-series analyzers, and gives brief details on the parameters of the commands.

It's assumed that you have previous experience in programming SCPI. This chapter is not intended to teach you everything about the SCPI programming language.

If you are not familiar with the SCPI language, [Chapter 4, "A Brief Introduction to the SCPI Language"](#), on page 188 contains some useful information.

If you are using other optional programming compatibility modes, you should refer to the manual that came with the option.

NOTE

Most FSE/FSP/FSU/ESU/FSV/FSL SCPI commands have a numeric suffix at the first node, corresponding to the Split Screen A/B feature, for example, CALCulate<1|2>, INITiate<1|2> and so on. However, the the SCPI LC Application does not support suffix "2". That is, Full Screen is assumed, and all commands are mapped as if to parameter <1>. Besides, the numeric suffix of "1" can be omitted, for example, CALCulate1 is equal to CALCulate.

If you send a command with the numeric suffix of "2", an error message will be displayed in the X-Series message area.

Keysight SCPI LC Application Supported IEEE SCPI Commands

The SCPI LC Application also supports the following IEEE 488.2 SCPI commands:

SCPI Commands	Description
*CAL?	Performs a full alignment and returns a number indicating the success of the alignment. A zero is returned if the alignment is successful. A one is returned if any part of the alignment fails.
*CLS	Clears the status byte. It does this by emptying the error queue and clearing all bits in all of the event registers. The status byte registers summarize the states of the other registers. It is also responsible for generating service requests.
*ESE <number> *ESE?	Selects the desired bits from the standard event status enable register. This register monitors I/O errors and synchronization conditions such as operation complete, request control, query error, device dependent error, execution error, command error and power on. The selected bits are OR'd to become a summary bit (bit 5) in the status byte register which can be queried. The query returns the state of the standard event status enable register.
*ESR?	Queries and clears the standard event status event register. (This is a destructive read.)
*IDN?	Returns an instrument identification information. The string will contain the model number, serial number and firmware revision. The response is organized into four fields separated by commas. The field definitions are as follows: 1.Manufacturer 2.Model 3.Serial number 4.Firmware version
*OPC *OPC?	The *OPC command sets bit 0 in the standard event status register to "1" when pending operations have finished. It does not hold off subsequent operations. The *OPC? query stops new commands from being processed until the current processing is complete. Then it returns a "1", and the program continues. This query can be used to synchronize events of other instruments on the external bus.
*OPT?	Returns a string of all the installed instrument options. It is a comma separated list such as: "BAC,BAH". There are a few options that include more than one mode. An instrument with one of these options will report the option number once for each mode.
*RCL <register>	This command recalls the instrument state from the specified instrument memory register.
*RST	This command presets the instrument to a factory defined condition that is appropriate for remote programming operation. *RST is equivalent to performing the commands: 1.:SYSTem:PRESet, with preset type set to MODE. 2.*CLS which clears the STATus bits and error queue 3.:INITiate:CONTinuous OFF which selects single sweep/measurement *RST does not change the mode and only resets the parameters for the current mode.
*SAV <register>	This command saves the instrument state to the specified instrument memory register.

Compatible SCPI Commands
Keysight SCPI LC Application Supported IEEE SCPI Commands

SCPI Commands	Description
*SRE <integer>	This command sets the value of the service request enable register.
*SRE?	The query returns the value of the register.
*STB?	Returns the value of the status byte register without erasing its contents.
*TRG	This command triggers the instrument. Use the command :TRIGger[:SEQuence]:SOURce to select the trigger source.
*TST?	This query performs a self test and returns a number indicating the success of the testing. A zero is returned if the test is successful.
*WAI	This command causes the instrument to wait until all pending commands/processes are completed before executing any additional commands. There is no query form for the command.

Supported SCPI Commands

Mode Selection

See “Selecting SCPI Language Compatibility Mode” on page 42.

Mode Setup

See “Mode Setup Menu” on page 44.

ABORt Subsystem

The ABORt subsystem contains commands for aborting triggered actions. An action may be triggered again immediately after being aborted. All commands trigger events, and therefore have no *RST value.

ABORt

Aborts any current measurement and resets the trigger system.

Remote Command	:ABORt
Example	:ABOR
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV ABORt

CALCulate:DELTamarker Subsystem

The CALCulate:DELTamarker subsystem controls the delta-marker functions.

NOTE

All delta marker functions are not supported in the CCDF and APD measurements.

FSV has 16 delta markers, but X-series can only support 4 delta markers.

CALCulate:DELTamarker[:STATe]

When delta marker 1 is selected, this command switches the delta marker on and off.

When any one of delta markers 2 through 4 is selected, that marker becomes the delta marker. If the marker was not activated, it becomes activated, and is placed at the maximum of the measurement curve.

If the numeric suffix is omitted, delta marker 1 is automatically selected.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4[:STATe] ON OFF 1 0 :CALCulate[1]:DELTamarker[1] 2 ... 4[:STATe]?
Example	CALC:DELT ON
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4[:STATe] ON OFF FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:DELTamarker:MODE

The command switches the frequency input of the delta marker between Absolute and Relative modes.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MODE ABSolute RELative :CALCulate[1]:DELTamarker[1] 2 ... 4:MODE?
Example	CALC:DELT:MODE ABS CALC:DELT:MODE REL CALC:DELT:MODE?
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:MODE ABSolute RELative FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:MODE ABSolute RELative
Preset	RELative
State Saved	Saved in instrument state.
Range	ABSolute RELative

CALCulate:DELTamarker:AOFF

Switches off all active delta markers.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:AOFF
Example	CALC:DELT:AOFF

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1]:DELTamarker[1]:2...:4:AOff FSV CALCulate[1]:DELTamarker[1]:2...:16:AOff
----------------------	--

CALCulate:DELTamarker:TRACe

Assigns the specified delta marker to the specified trace.

Remote Command	:CALCulate[1]:DELTamarker[1]:2...:4:TRACe 1 2 3 4 5 6
Example	CALC:DELT:TRAC 1
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE CALCulate[1]:DELTamarker[1]:2...:4:TRACe 1 2 3 4 FSP, FSU, ESU CALCulate[1]:DELTamarker[1]:2...:4:TRACe 1 2 3 FSL CALCulate[1]:DELTamarker[1]:2...:4:TRACe 1 2 3 4 5 6 FSV CALCulate[1]:DELTamarker[1]:2...:16:TRACe 1 2 3 4 5 6
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	3

CALCulate:DELTamarker:X

The command positions the specified delta marker at the indicated frequency (span > 0) or time (span = 0).

The query returns the current value of this parameter.

Remote Command	:CALCulate[1]:DELTamarker[1]:2...:4:X <freq> <time> :CALCulate[1]:DELTamarker[1]:2...:4:X?
Example	CALC:DELT:X 10.7MHz CALC:DELT:X?

Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE :CALCulate[1]:DELTamarker[1]:2...:4:X 0 to MAX (frequency sweep time symbols) FSP, FSU, ESU, FSL CALCulate[1]:DELTamarker[1]:2...:4:X 0 to MAX (frequency sweep time) FSV CALCulate[1]:DELTamarker[1]:2...:16:X 0 to MAX (frequency sweep time)
----------------------	--

CALCulate:DELTamarker:X:RELative?

Queries the frequency or time value of the specified delta marker, relative to marker 1, or to the reference position (for CALCulate:DELTamarker:FUNCTION:FIXed:STATe ON). If required, the corresponding delta marker is activated.

This command is not supported in the CCDF and APD measurements.

Remote Command	:CALCulate[1]:DELTamarker[1]:2...:4:X:RELative?
Example	CALC:DELT:X:REL?
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1]:DELTamarker[1]:2...:4:X:RELative? FSL CALCulate[1]:DELTamarker[1]:2...:16:X:RELative?

CALCulate:DELTamarker:Y?

Queries the measured value of the specified delta marker. If required, the specified delta marker is activated. The returned result is a value relative to marker 1, or to the reference position if the reference is fixed.

To obtain a valid query result, a complete sweep with synchronization to the sweep end must be performed between the activation of the delta marker and the query of the y value. This is only possible in single sweep mode.

Depending on the unit defined with CALCulate:UNIT:POWer or on the activated measuring functions, the query result is output in the units below:

Parameter or measuring functions	Output unit
DBM DBPW DBUV DBMV DBUA	dB (lin/log)
WATT VOLT AMPere	dB (lin), % (log)
Statistics function (APD or CCDF) on	dimensionless output
(FSP) Result display FM (FS-K7)	HA

Parameter or measuring functions	Output unit
(FSP) Result display RF POWER (FS-K7)	dB
(FSP) Result display SPECTRUM (FS-K7)	dB

The only unit supported is dB.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:Y?
Example	CALC:DELT:Y?
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:Y? FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:Y?

CALCulate:DELTamarker:MAXimum[:PEAK]

Places the delta marker at the current maximum value of the trace. If required, the specified delta marker is first activated.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MAXimum[:PEAK]
Example	CALC:DELT:MAX
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:MAXimum[:PEAK] FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:MAXimum[:PEAK]

CALCulate:DELTamarker:MAXimum:LEFT

Places the delta marker at the next smaller maximum to the left of the current value (that is, in order of decreasing X values). If required, the specified delta marker is first activated.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MAXimum:LEFT
Example	CALC:DELT:MAX:LEFT
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:MAXimum:LEFT FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:MAXimum:LEFT

CALCulate:DELTamarker:MAXimum:NEXT

Places the delta marker at the next smaller maximum on the trace. If required, the specified delta marker is first activated.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MAXimum:NEXT
Example	CALC:DELT:MAX:NEXT
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:MAXimum:NEXT FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:MAXimum:NEXT

CALCulate:DELTamarker:MAXimum:RIGHT

Places the delta marker at the next smaller maximum to the right of the current value (that is, in order of increasing X values). If required, the specified delta marker is first activated.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MAXimum:RIGHT
Example	CALC:DELT:MAX:RIGH
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:MAXimum:RIGHT FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:MAXimum:RIGHT

CALCulate:DELTamarker:MINimum[:PEAK]

Places the delta marker at the current minimum on the trace. If required, the specified delta marker is first activated.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MINimum[:PEAK]
Example	CALC:DELT:MIN
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:MINimum[:PEAK] FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:MINimum[:PEAK]

CALCulate:DELTamarker:MINimum:LEFT

Places the delta marker at the next higher minimum to the left of the current value (that is, in order of decreasing X values). If required, the specified delta marker is first activated.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MINimum:LEFT
Example	CALC:DELT:MIN:LEFT
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:DELTamarker[1]:2 ... 4:MINimum:LEFT FSV CALCulate[1]:2:DELTamarker[1]:2 ... 16:MINimum:LEFT

CALCulate:DELTamarker:MINimum:NEXT

Places the delta marker at the next higher minimum of the trace. If required, the specified delta marker is first activated.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MINimum:NEXT
Example	CALC:DELT:MIN:NEXT
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:DELTamarker[1]:2 ... 4:MINimum:NEXT FSV CALCulate[1]:2:DELTamarker[1]:2 ... 16:MINimum:NEXT

CALCulate:DELTamarker:MINimum:RIGHT

Places the delta marker at the next higher minimum to the right of the current value (that is, in order of increasing X values). If required, the specified delta marker is first activated.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:MINimum:RIGHT
Example	CALC:DELT:MIN:RIGH
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:DELTamarker[1]:2 ... 4:MINimum:RIGHT FSV CALCulate[1]:2:DELTamarker[1]:2 ... 16:MINimum:RIGHT

CALCulate:DELTamarker:LINK ON | OFF

The command switches the link between delta marker 1 and marker 1 on or off.

If the link is “on”, and the X-axis value of marker 1 is changed, then delta marker 1 will change by the same amount.

The numeric suffix of DELTmarker may only be 1, or be omitted, because this functionality is only available for marker 1 and delta marker 1.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:LINK ON OFF 1 0 :CALCulate[1]:DELTamarker[1] 2 ... 4:LINK?
Example	CALC:DELT:LINK ON
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSU, ESU CALCulate[1]2:DELTamarker[1]2 ... 4:LINK ON OFF FSV CALCulate[1]2:DELTamarker[1]2 ... 16:LINK ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:DELTamarker:FUNCTION:FIXed[:STATE]

The command switches between relative measurement, and measurement relative to a fixed reference.

If required, marker 1 is activated and a peak search is performed.

If marker 1 is activated, its position becomes the reference point for the measurement. The reference point can then be changed, using commands CALCulate:DELTamarker:FUNCTION:FIXed:RPOint:X and :RPOint:Y, independently of the position of marker 1 and of any trace.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:FIXed[:STATE] ON OFF 1 0 :CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:FIXed[:STATE]?
Example	CALC:DELT:FUNC:FIX ON
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1]2:DELTamarker[1]2 ... 4:FUNCTION:FIXed[:STATE] ON OFF FSV CALCulate[1]2:DELTamarker[1]2 ... 16:FUNCTION:FIXed[:STATE] ON OFF

Preset	OFF
State Saved	Saved in instrument state.

CALCulate:DELTamarker:FUNCTION:FIXed:RPOint:MAXimum[:PEAK]

Sets the reference point for all delta markers when you are making measurements using a fixed reference point (enabled by the command CALC:DELT:FUNC:FIX:STAT ON). You can specify a value using the parameter, or specify the peak of the selected trace [:PEAK].

For phase-noise measurements (selected via CALCulate:DELTamarker:FUNCTION:PNOise:STATe ON), the command specifies a new reference point for delta marker 2.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:FIXed:RPOint:MAXimum[:PEAK]
Example	CALC:DELT:FUNC:FIX:RPO:MAX
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSP, FSU, ESU, FSL CALCulate[1]2:DELTamarker[1]2 ... 4:FUNCTION:FIXed:RPOint:MAXimum[:PEAK] FSV CALCulate[1]2:DELTamarker[1]2 ... 16:FUNCTION:FIXed:RPOint:MAXimum[:PEAK]

CALCulate:DELTamarker:FUNCTION:FIXed:RPOint:Y

Sets or queries a Y-axis reference point for all delta markers when you are making measurements using a fixed reference point (enabled by CALCulate:DELTamarker:FUNCTION:FIXed:STATe ON).

For phase-noise measurements (selected via CALCulate:DELTamarker:FUNCTION:PNOise:STATe ON), the command specifies a new reference point level for delta marker 2.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:FIXed:RPOint:Y<amp1> :CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:FIXed:RPOint:Y?
Example	CALC:DELT2:FUNC:FIX:RPO:Y -10DBM CALC:DELT2:FUNC:FIX:RPO:Y?
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers.

Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1]:DELTamarker[1]:2:...:4:FUNCTION:FIXed:RPOint:Y <numeric_value> FSV CALCulate[1]:DELTamarker[1]:2:...:16:FUNCTION:FIXed:RPOint:Y <numeric_value>
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CALCulate:DELTamarker:FUNCTION:FIXed:RPOint:Y:OFFSet

Sets or queries the additional offset for all delta markers when you are making measurements using a fixed reference value (enabled by CALCulate:DELTamarker:FUNCTION:FIXed:STATe ON).

For phase-noise measurements (selected via CALCulate:DELTamarker:FUNCTION:PNOise:STATe ON), specifies an additional offset that is included in the display of delta marker 2.

Remote Command	<pre>:CALCulate[1]:DELTamarker[1]:2 ... 4:FUNCTION:FIXed:RPOint:Y:OFFSet <rel_ampl></pre> <pre>:CALCulate[1]:DELTamarker[1]:2 ... 4:FUNCTION:FIXed:RPOint:Y:OFFSet?</pre>
Example	<pre>CALC:DELT2:FUNC:FIX:RPO:Y:OFFS 10DB</pre> <pre>CALC:DELT2:FUNC:FIX:RPO:Y:OFFS?</pre>
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:DELTamarker[1]:2:...:4:FUNCTION:FIXed:RPOint:Y:OFFSet <numeric_value> FSV CALCulate[1]:DELTamarker[1]:2:...:16:FUNCTION:FIXed:RPOint:Y:OFFSet <numeric_value>
Preset	0

CALCulate:DELTamarker:FUNCTION:FIXed:RPOint:X

Sets or queries the reference frequency or time for all delta markers when you are making measurements using a fixed reference value (enabled by CALCulate:DELTamarker:FUNCTION:FIXed:STATe ON).

For phase-noise measurements (selected via CALCulate:DELTamarker:FUNCTION:PNOise:STATe ON), specifies a reference frequency or time for delta marker 2.

Remote Command	<pre>:CALCulate[1]:DELTamarker[1]:2 ... 4:FUNCTION:FIXed:RPOint:X<freq> <time></pre> <pre>:CALCulate[1]:DELTamarker[1]:2 ... 4:FUNCTION:FIXed:RPOint:X?</pre>
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Example	CALC:DELT2:FUNC:FIX:RPO:X 10MHz CALC1:DELT:FUNC:FIX:RPO:X?
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:FUNCTION:FIXed:RPOint:X <numeric_value> FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:FUNCTION:FIXed:RPOint:X <numeric_value>

CALCulate:DELTamarker:FUNCTION:PNOise[:STATE]

The command switches phase-noise measurement on or off for all active delta markers. All correction values are included.

If required, marker 1 is activated, and a peak search is performed. If marker 1 is activated, its position becomes the measurement's reference point.

The measurement's reference point can be modified with commands CALCulate:DELTamarker:FUNCTION:FIXed:RPOint:X and ...:RPOint:Y, independently of the position of marker 1 and of any trace.

The DELTmarker numeric suffix [1]|2|3|4 is not required for this command.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:PNOise[:STATE] ON OFF 1 0 :CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:PNOise[:STATE]?
Example	CALC:DELT:FUNC:PNO ON
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:DELTamarker[1] 2 ... 4:FUNCTION:PNOise[:STATE] ON OFF FSV CALCulate[1] 2:DELTamarker[1] 2 ... 16:FUNCTION:PNOise[:STATE] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:DELTamarker:FUNCTION:PNOise:AUTO

The command switches on or off automatic peak search action for fixed reference marker 1. When activated, this search occurs at the end of each sweep.

You can use this functionality to track a drifting source during a phase noise measurement. Delta marker 2, which shows the phase noise measurement result, retains the delta frequency value. Therefore the results of phase noise measurement with a specified offset remain valid.

When marker 2 reaches the limit of the span, the delta marker value is automatically adjusted to be within the span. In such cases, select a wider span.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:PNOise:AUTO ON OFF 1 0 :CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:PNOise:AUTO?
Example	CALC:DELT:FUNC:PNO:AUTO ON
Remote Command Notes	FSV has 16 delta markers while X-series can only support 4 delta markers. FSU, ESU CALCulate[1]2:DELTamarker[1]2 ... 4:FUNCTION:PNOise:AUTO ON OFF FSV CALCulate[1]2:DELTamarker[1]2 ... 16:FUNCTION:PNOise:AUTO ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:DELTamarker:FUNCTION:PNOise:RESult?

Queries the result of a phase noise measurement. If required, the measurement is switched on.

Remote Command	:CALCulate[1]:DELTamarker[1] 2 ... 4:FUNCTION:PNOise:RESult?
Example	CALC:DELT:FUNC:PNO:RES?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]2:DELTamarker[1]2 ... 4:FUNCTION:PNOise:RESult? FSV CALCulate[1]2:DELTamarker[1]2 ... 16:FUNCTION:PNOise:RESult?
SCPI Remarks	FSV has 16 delta markers while X-series can only support 4 delta markers.

CALCulate:LIMit Subsystem

The CALCulate:LIMit subsystem includes the limit lines and limit checks. Limit lines may be defined as upper or lower. The limit line Y-values correspond to the X-axis values. The number of x and y values must be identical.

X Series Analyzers support up to 6 active limit lines at the same time.

CALCulate:LIMit:ACTive?

Queries the names of all active limit lines. For this command, all the numeric suffixes are ignored.

The return values are sorted alphabetically. If there are no active limit lines, an empty string is returned.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACTive?
Example	CALC:LIM:ACT?
Remote Command Notes	FSE, FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1 to 8>:ACTive?
Preset	""
State Saved	Saved in instrument state.

CALCulate:LIMit:TRACe

The command assigns a limit line to a trace.

The query returns the current assignment.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:TRACe 1 2 3 4 5 6 :CALCulate[1]:LIMit[1] 2 ... 6:TRACe?
Example	CALC:LIM:TRAC 1
Remote Command Notes	FSE CALCulate[1]]2:LIMit<1 to 8>:TRACe 1 2 3 4 FSP, FSU, ESU CALCulate[1]]2:LIMit<1 to 8>:TRACe 1 2 3 FSL, FSV CALCulate[1]]2:LIMit<1...8>:TRACe 1 2 3 4 5 6
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	6

CALCulate:LIMit:STATe

The command switches the limit check for the specified limit line on or off.

The limit check result may be queried using CALCulate:LIMit:FAIL?.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:STATe ON OFF 1 0 :CALCulate[1]:LIMit[1] 2 ... 6:STATe?
Example	CALC:LIM:STAT ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1] 2:LIMit<1...8>:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:LIMit:UNIT

The command specifies the unit for all limit lines.

This mode supports only the following amplitude units: DBM, DBPW, WATT, DBUV, DBMV, VOLT, DBUA and DB.

The command ignores the numeric suffix of LIMit, and sets all limit lines to the same unit.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:UNIT DBM DBUV DBMV DBUA A V W :CALCulate[1]:LIMit[1] 2 ... 6:UNIT?
Example	CALC:LIM:UNIT DBM CALC:LIM:UNIT?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE CALCulate[1]]2:LIMit<1 to 8>:UNIT DBM DBPW DBPT WATT DBUV DBMV VOLT DBUA AMPere DB DBUV_MHZ DBMV_MHZ DBUA_MHZ DBUV_M DBUA_M DBUV_MMHZ DBUA_MMHZ UNITLESS FSP CALCulate[1]]2:LIMit<1 to 8>:UNIT DBM DBPW WATT DBUV DBMV VOLT DBUA AMPere DB DEG RAD S HZ PCT UNITLESS FSU, ESU CALCulate[1]]2:LIMit<1 to 8>:UNIT DBM DBPW WATT DBUV DBMV VOLT DBUA AMPere DB UNITLESS FSL CALCulate[1]]2:LIMit<1...8>:UNIT DBM DBPW WATT DBUV DBMV VOLT DBUA AMPere DB DEG RAD HZ PCT FSV CALCulate[1]]2:LIMit<1...8>:UNIT DBM DBPW WATT DBUV DBMV VOLT DBUA AMPere DB DBUV_M DBUA_M DEG RAD S HZ PCT (unitless)
Preset	DBM
State Saved	Saved in instrument state.
Range	DBM DBUV DBMV DBUA A V W

CALCulate:LIMit:FAIL?

Returns the limit check result for the specified limit line.

To obtain a valid result, you must perform a complete sweep. A synchronization with *OPC, *OPC? or *WAI should therefore be provided.

The numeric value returned has the following meaning:

0	PASS
1	FAIL
2	MARGIN

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:FAIL?
Example	CALC:LIM:FAIL?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1...8>:FAIL?
Min	0
Max	1

CALCulate:LIMit:CLEar[:IMMediate]

Deletes the current limit check result for all limit lines.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:CLEar[:IMMediate]
Example	CALC:LIM:CLE
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1...8>:CLEar[:IMMediate]

CALCulate:LIMit:COMMeNt <string>

The command defines a comment for the specified limit line. The comment string may have a maximum length of 40 characters.

The query returns the current value of this string.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:COMMeNt <string> :CALCulate[1]:LIMit[1] 2 ... 6:COMMeNt?
Example	CALC:LIM:COMM 'GSM2' CALC:LIM:COMM?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1...8>:COMMeNt <string>, max. 40 characters
Preset	""
State Saved	Saved in instrument state.

CALCulate:LIMit:COpy 1|2|3|4|5|6 | <name>

Copies the limit line specified by the numeric suffix of LIMit onto the limit line specified by the command's parameter.

This mode does not support the parameter option <name>.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:COpy <int>
Example	CALC:LIM:COpy 2
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1 to 8>:COpy 1 to 8 <name>
Min	1
Max	6

CALCulate:LIMit:NAME <name of limit line>

The command assigns a name to the limit line specified by the numeric suffix of LIMit. A limit line with this name is created, if it does not already exist.

The query returns the current value of this string.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:NAME <string> :CALCulate[1]:LIMit[1] 2 ... 6:NAME?
Example	CALC:LIM:NAME 'test' CALC:LIM:NAME?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:LIMit<1...8>:NAME <name of limit line>
Preset	'REM1' to 'REM6' for lines 1 2 3 4 5 6
State Saved	Saved in instrument state.

CALCulate:LIMit:DElete

Deletes the specified limit line.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:DElete
Example	CALC:LIM:DEL
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:LIMit<1 to 8>:DElete

CALCulate:LIMit:ESpectrum Subsystem

The CALCulate:LIMit:SPECTrum subsystem defines the limit check for spectrum emission measurements.

The following SCPI commands of this subsystem are accepted by the analyzer, but result in no action, and report no error.

CALCulate:LIMit:ESpectrum:MODE AUTO | MANual | USER

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ESpectrum:MODE AUTO MANual USER :CALCulate[1]:LIMit[1] 2 ... 6:ESpectrum:MODE?
Example	CALC:LIM:ESP:MODE AUTO CALC:LIM:ESP:MODE
Remote Command Notes	FSP CALCulate[1]:LIMit<1...8>:ESpectrum:MODE AUTO MANual USER FSV CALCulate[1]:LIMit<1...8>:ESpectrum:MODE AUTO MANual
Preset	AUTO

State Saved	Saved in instrument state.
Range	AUTO MANual USER
CALCulate:LIMit:ESpectrum:VALue Sets manual limit line selection. The limit line is selected by specifying the expected dBm power. This command is accepted, but takes no action and reports no error.	
Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ESpectrum:VALue <integer> :CALCulate[1]:LIMit[1] 2 ... 6:ESpectrum:VALue?
Example	CALC:LIM:ESP:VAL 39 CALC:LIM:ESP:VAL?
Remote Command Notes	FSP, FSV CALCulate[1]2:LIMit<1...8>:ESpectrum:VALue <numeric_value>
Preset	0

CALCulate:LIMit:ESpectrum:RESTore

Restores the standard limit lines for the spectrum emission mask measurement. Any modifications that were made to the standard limit lines are lost, and the default setting is restored.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ESpectrum:RESTore
Example	CALC:LIM:ESP:REST
Remote Command Notes	FSP, FSV CALCulate[1]2:LIMit<1...8>:ESpectrumRESTore

CALCulate:LIMit:ACPower Subsystem

CALCulate:LIMit:ACPower[:STATe]

This command switches on and off the limit check for adjacent channel power measurements in the selected measurement window. The commands CALCulate:LIMit:ACPower:ACHannel:STATe or CALCulate:LIMit:ACPower:ALternate:STATe must be used in addition to specify whether the limit check is to be performed for the upper/lower adjacent channel or for the alternate adjacent channels.

The numeric suffixes after LIMit are irrelevant for this command.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower[:STATe] ON OFF 1 0 :CALCulate[1]:LIMit[1] 2 ... 6:ACPower[:STATe]?
Example	CALC:LIM:ACP ON CALC:LIM:ACP?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:ACPower[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ACHannel[:RELative]

This command defines the relative limit of the upper/lower adjacent channel for adjacent channel power measurements in the selected measurement window. The reference value for the relative limit value is the measured channel power.

It should be noted that the relative limit value has no effect on the limit check as soon as it is below the absolute limit value defined with CALCulate:LIMit:ACPower:ACHannel:ABSolute. This mechanism allows automatic checking of the absolute basic values of adjacent channel power as defined in mobile radio standards.

The numeric suffixes after LIMit are irrelevant for this command.

Parameter: The first numeric value is the limit for the upper (lower) adjacent channel. The second value is ignored but must be indicated for reasons of compatibility with the FSE family.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel[:RELative] <rel_ampl>,<rel_ampl> :CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel[:RELative]?
Example	CALC:LIM:ACP:ACH 30DB, 30DB CALC:LIM:ACP:ACH:REL 30DB, 30DB CALC:LIM:ACP:ACH? CALC:LIM:ACP:ACH:REL?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1...8>:ACPower:ACHannel[:RELative] <0 to 100dB>,<0 to 100dB>
Preset	0dB, 0dB
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ACHannel[:RELative]:STATe

This command activates the limit check for the relative limit value of the adjacent channel when adjacent channel power measurement is performed. Before the command, the limit check must be activated using CALCulate:LIMit:ACPower:STATe ON.

The result can be queried with CALCulate:LIMit:ACPower:ACHannel:RESult?. It should be noted that a complete measurement must be performed between switching on the limit check and the result query, since otherwise no valid results are available.

The numeric suffixes after LIMit are irrelevant for this command.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel[:RELative]:STATe ON OFF 1 0 :CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel[:RELative]:STATe?
Example	CALC:LIM:ACP:ACH:STAT ON CALC:LIM:ACP:ACH:REL:STAT ON CALC:LIM:ACP:ACH:STAT? CALC:LIM:ACP:ACH:REL:STAT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1] 2:LIMit<1 to 8>:ACPower:ACHannel[:RELative]:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ACHannel:ABSolute

This command defines the absolute limit value for the lower/upper adjacent channel during adjacentchannel power measurement (Adjacent Channel Power) in the selected measurement window.

It should be noted that the absolute limit value has no effect on the limit check as soon as it is below the relative limit value defined with CALCulate:LIMit:ACPower:ACHannel:RELative. This mechanism allows automatic checking of the absolute basic values of adjacent channel power as defined in mobile radio standards.

The numeric suffixes after LIMit are irrelevant for this command.

Parameter: The first value is the limit for the lower and the upper adjacent channel. The second limit value is ignored.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel:ABSolute <ampl>,<ampl> :CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel:ABSolute?
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Example	CALC:LIM:ACP:ACH:ABS 30DBM, 30DBM CALC:LIM:ACP:ACH:ABS?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1...8>:ACPower:ACHannel:ABSolute <-200dBm to 200dBm>,<-200dBm to 200dBm>
Preset	-200dBm, -200dBm
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ACHannel:ABSolute:STATe

This command activates the limit check for the adjacent channel when adjacent-channel power measurement (Adjacent Channel Power) is performed. Before the command, the limit check for the channel/adjacent-channel measurement must be globally switched on using CALC:LIM:ACP ON.

The result can be queried with CALCulate:LIMit:ACPower:ACHannel:RESult?. It should be noted that a complete measurement must be performed between switching on the limit check and the result query, since otherwise no valid results are available.

The numeric suffixes after LIMIt are irrelevant for this command.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel:ABSolute:STATe ON OFF 1 0 :CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel:ABSolute:STATe?
Example	CALC:LIM:ACP:ACH:ABS:STAT ON CALC:LIM:ACP:ACH:ABS:STAT?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:ACPower:ACHannel:ABSolute:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ACHannel:RESult?

This command queries the result of the limit check for the upper/lower adjacent channel in the selected measurement window when adjacent channel power measurement is performed.

If the power measurement of the adjacent channel is switched off, the command produces a query error.

The numeric suffixes after LIMIt are irrelevant for this command.

Parameter: The result is returned in the form <result>, <result> where <result> = PASSED | FAILED, and where the first returned value denotes the lower, the second denotes the upper adjacent channel.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ACHannel:RESult?
Example	CALC:LIM:ACP:ACH:RES?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1 to 8>:ACPower:ACHannel:RESult?

CALCulate:LIMit:ACPower:ALternate[:RELative]

This command defines the limit for the first/second alternate adjacent channel in the selected measurement window for adjacent channel power measurements. The reference value for the relative limit value is the measured channel power.

The numeric suffix after ALternate denotes the first or the second alternate channel. The numeric suffixes after LIMit are irrelevant for this command.

It should be noted that the relative limit value has no effect on the limit check as soon as it is below the absolute limit defined with CALCulate:LIMit:ACPower:ALternate:ABSolute. This mechanism allows automatic checking of the absolute basic values of adjacent channel power as defined in mobile radio standards.

Parameter: The first value is the limit for the lower and the upper alternate adjacent channel. The second limit value is ignored.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ALternate[1] 2[:RELative] <rel_amp1>,<rel_amp1> :CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ALternate[1] 2[:RELative]?
Example	CALC:LIM:ACP:ALT 30DB, 30DB CALC:LIM:ACP:ALT2:REL 30DB, 30DB CALC:LIM:ACP:ALT? CALC:LIM:ACP:ALT2:REL?
Remote Command Notes	FSE, FSP CALCulate[1]]2:LIMit<1 to 8>:ACPower:ALternate<1 to 2>[:RELative] <0 to 100dB>,<0 to 100dB> FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1 to 8>:ACPower:ALternate[1]]2 ... 11[:RELative] <0 to 100dB>,<0 to 100dB>
Preset	0dB, 0dB
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ALTErnate[:RELative]:STATe

This command activates the limit check for the first/second alternate adjacent channel in the selected measurement window for adjacent channel power measurements. Before the command, the limit check must be activated using CALCulate:LIMit:ACPower:STATe ON.

The numeric suffix after ALTErnate denotes the first or the second alternate channel. The numeric suffixes after LIMit are irrelevant for this command.

The result can be queried with CALCulate:LIMit:ACPower:ALTErnate:RESult?. It should be noted that a complete measurement must be performed between switching on the limit check and the result query, since otherwise no valid results are obtained.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ALTErnate[1] 2[:RELati ve]:STATe ON OFF 1 0 :CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ALTErnate[1] 2[:RELati ve]:STATe?
Example	CALC:LIM:ACP:ALT:STAT ON CALC:LIM:ACP:ALT2:REL:STAT ON CALC:LIM:ACP:ALT:STAT? CALC:LIM:ACP:ALT2:REL:STAT?
Remote Command Notes	FSE, FSP, FSU, ESU CALCulate[1]2:LIMit<1 to 8>:ACPower:ALTErnate[1]2:STATe ON OFF FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:ACPower:ALTErnate[1]2 ... 11[:RELative]:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ALTErnate:ABSolute

This command defines the absolute limit value for the lower/upper alternate adjacent channel power measurement (Adjacent Channel Power) in the selected measurement window.

The numeric suffix after ALTErnate denotes the first or the second alternate channel. The numeric suffixes after LIMit are irrelevant for this command.

It should be noted that the absolute limit value for the limit check has no effect as soon as it is below the relative limit value defined with CALCulate:LIMit:ACPower:ALTErnate:RELative. This mechanism allows automatic checking of the absolute basic values defined in mobile radio standards for the power in adjacent channels.

Parameter: The first value is the limit for the lower and the upper alternate adjacent channel. The second limit value is ignored.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ALternate[1] 2:ABSolute <ampl>,<ampl> :CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ALternate[1] 2:ABSolute?
Example	CALC:LIM:ACP:ALT:ABS 30DBM, 30DBM CALC:LIM:ACP:ALT:ABS?
Remote Command Notes	FSP CALCulate[1] 2:LIMit<1...8>:ACPower:ALternate<1 2 >:ABSolute <-200DBM to 200DBM>,<-200DBM to 200DBM> FSU, ESU, FSL, FSV CALCulate[1] 2:LIMit<1...8>:ACPower:ALternate<1...11>:ABSolute <-200DBM to 200DBM>,<-200DBM to 200DBM>
Preset	-200dBm, -200dBm
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ALternate:ABSolute:STATE

This command activates the limit check for the first/second alternate adjacent channel in the selected measurement window for adjacent channel power measurement (Adjacent Channel Power).

Before the command, the limit check must be globally switched on for the channel/adjacent channel power with the command
CALCulate:LIMit:ACPower:STATE ON.

The numeric suffix after ALternate denotes the first or the second alternate channel. The numeric suffixes after LIMit are irrelevant for this command.

The result can be queried with CALCulate:LIMit:ACPower:ALternate:RESult?. It should be noted that a complete measurement must be performed between switching on the limit check and the result query, since otherwise no valid results are available.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ALternate[1] 2:ABSolute:STATE ON OFF 1 0 :CALCulate[1]:LIMit[1] 2 ... 6:ACPower:ALternate[1] 2:ABSolute:STATE?
Example	CALC:LIM:ACP:ALT:ABS:STAT ON CALC:LIM:ACP:ALT:ABS:STAT?

Remote Command Notes	FSP CALCulate[1]2:LIMit<1 to 8>:ACPower:ALTErnate[1]2:ABSolute:STATe ON OFF FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:ACPower:ALTErnate[1]2 ... 11:ABSolute:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:LIMit:ACPower:ALTErnate:RESult?

This command queries the result of the limit check for the first/second alternate adjacent channel in the selected measurement window for adjacent channel power measurements.

The numeric suffix after ALTErnate denotes the first or the second alternate channel. The numeric suffixes after LIMit are irrelevant for this command.

If the power measurement of the adjacent channel is switched off, the command produces a query error.

Parameter: The result is returned in the form <result>, <result> where <result> = PASSED | FAILED and where the first (second) returned value denotes the lower (upper) alternate adjacent channel.

Remote Command	:CALCulate[1]:LIMit[1]2 ... 6:ACPower:ALTErnate[1]2:RESult?
Example	CALC:LIM:ACP:ALT:RES? CALC:LIM:ACP:ALT2:RES?
Remote Command Notes	FSE, FSP CALCulate[1]2:LIMit<1 to 8>:ACPower:ALTErnate[1]2:RESult? FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1...8>:ACPower:ALTErnate<1...11>:RESult?

CALCulate:LIMit:CONTRol Subsystem

The CALCulate:LIMit:CONTRol subsystem controls the X-axis..

NOTE

All limit functions are not supported in the CCDF and APD measurements.

CALCulate:LIMit:CONTRol[:DATA]

The command specifies the X-axis values (frequencies or times) of the upper or lower limit lines.

The query returns the current values of these settings.

Remote Command	<code>:CALCulate[1]:LIMit[1] 2 ... 6:CONTRol[:DATA] <freq>,<freq>... <time>,<time>,... :CALCulate[1]:LIMit[1] 2 ... 6:CONTRol[:DATA]?</code>
Example	<code>CALC:LIM:CONT:DATA 1.0e7,2.0e7,1.0e8,3.0e8,1.0e9 CALC:LIM:CONT:DATA?</code>
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV <code>CALCulate[1]2:LIMit<1 to 8>:CONTRol[:DATA] <numeric_value>,<numeric_value>..</code>
State Saved	Saved in instrument state.

CALCulate:LIMit:CONTRol:DOMain FREQuency | TIME

The command switches between frequency or time domain for the X-axis.

The query returns the current state of this setting.

Remote Command	<code>:CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:DOMain FREQuency TIME :CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:DOMain?</code>
Example	<code>CALC:LIM:CONT:DOM FREQ CALC:LIM:CONT:DOM?</code>
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV <code>CALCulate[1]2:LIMit<1...8>:CONTRol:DOMain FREQuency TIME</code>
Preset	FREQuency
State Saved	Saved in instrument state.
Range	FREQuency TIME

CALCulate:LIMit:CONTRol:OFFSet

The command defines an offset for the X-axis value of the specified relative limit line, in the frequency or time domain.

The query returns the current value of this setting.

Remote Command	<code>:CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:OFFSet <freq> <time> :CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:OFFSet?</code>
Example	<code>CALC:LIM:CONT:OFFS 1 CALC:LIM:CONT:OFFS?</code>
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV <code>CALCulate[1]2:LIMit<1...8>:CONTRol:OFFSet <numeric_value></code>
Preset	0

CALCulate:LIMit:CONTRol:MODE RELative | ABSolute

The command switches between relative or absolute scaling for the X-axis of the specified limit line.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:MODE RELative ABSolute :CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:MODE?
Example	CALC:LIM:CONT:MODE ABS CALC:LIM:CONT:MODE
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:CONTRol:MODE RELative ABSolute
Preset	ABS
State Saved	Saved in instrument state.
Range	RELative ABSolute

CALCulate:LIMit:CONTRol:SHIFt

The command shifts the specified limit line in the X-direction, by the specified value.

The query returns the current value of this setting for the specified limit line.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:SHIFt <freq> <time> :CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:SHIFt?
Preset	0
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1...8>:CONTRol:SHIFt <numeric_value>
Example	CALC:LIM:CONT:SHIF 1 CALC:LIM:CONT:SHIF?

CALCulate:LIMit:CONTRol:SPACing LINear | LOGarithmic

The command switches between linear or logarithmic interpolation for calculation of limit lines from frequency points.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:SPACing LINear LOGarithmic :CALCulate[1]:LIMit[1] 2 ... 6:CONTRol:SPACing?
----------------	--

Example	CALC:LIM:CONT:SPAC LOG CALC:LIM:CONT:SPAC
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:CONTrol:SPACing LINear LOGarithmic
Preset	LIN
State Saved	Saved in instrument state.
Range	LINear LOGarithmic

CALCulate:LIMit:LOWer Subsystem

The CALCulate:LIMit:LOWer subsystem controls the lower limit line.

NOTE

All limit functions are not supported in the CCDF and APD measurements.

CALCulate:LIMit:LOWer[:DATA]

The command defines a set of values for the specified lower limit line.

The query returns the current value set.

Remote Command	CALCulate[1]:LIMit[1]2 ... 6:LOWer[:DATA] <real>,<real>... CALCulate[1]:LIMit[1]2 ... 6:LOWer[:DATA]?
Example	CALC:LIM:LOW:DATA 1,20,100,300,1 CALC:LIM:LOW:DATA?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:LOWer[:DATA] <numeric_value>,<numeric_value>..
State Saved	Saved in instrument state.

CALCulate:LIMit:LOWer:STATe

The command activates or deactivates the specified lower limit line. Limit check is activated separately, using CALC:LIM:STAT ON.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1]2 ... 6:LOWer:STATe ON OFF 1 0 :CALCulate[1]:LIMit[1]2 ... 6:LOWer:STATe?
Example	CALC:LIM:LOW:STAT OFF CALC:LIM:LOW:STAT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1...8>:LOWer:STATe ON OFF

Preset	OFF
State Saved	Saved in instrument state.

CALCulate:LIMit:LOWer:OFFSet

The command defines an offset for the Y axis of the specified relative lower limit line.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:LOWer:OFFSet <rel_amp1> :CALCulate[1]:LIMit[1] 2 ... 6:LOWer:OFFSet?
Example	CALC:LIM:LOW:OFFS 1DB CALC:LIM:LOW:OFFS?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1 to 8>:LOWer:OFFSet <numeric_value>
Preset	0

CALCulate:LIMit:LOWer:MARGin

The command defines a margin for the specified lower limit line. At the margin level, out-of-limit values are signaled (if the limit check is active), but are not treated as violations of the limit value.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:LOWer:MARGin <rel_amp1> :CALCulate[1]:LIMit[1] 2 ... 6:LOWer:MARGin?
Example	CALC:LIM:LOW:MARG 10DB CALC:LIM:LOW:MARG?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]]2:LIMit<1 to 8>:LOWer:MARGin <numeric_value>
Preset	0

CALCulate:LIMit:LOWer:MODE

The command switches between relative or absolute scaling for the Y-axis of the specified lower limit line.

Selecting RELative causes the unit to be switched to dB.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:LOWer:MODE RELative ABSolute :CALCulate[1]:LIMit[1] 2 ... 6:LOWer:MODE?
Example	CALC:LIM:LOW:MODE ABS CALC:LIM:LOW:MODE?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1...8>:LOWer:MODE RELative ABSolute
Preset	ABS
State Saved	Saved in instrument state.
Range	RELative ABSolute

CALCulate:LIMit:LOWer:SHIFt

The command shifts the specified limit line in the Y-direction, by the specified amount.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:LOWer:SHIFt <rel_amp1> :CALCulate[1]:LIMit[1] 2 ... 6:LOWer:SHIFt?
Example	CALC:LIM:LOW:SHIF 1 CALC:LIM:LOW:SHIF?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:LOWer:SHIFt <numeric_value>
Preset	0

CALCulate:LIMit:LOWer:SPACing

The command switches between linear or logarithmic interpolation for the lower limit line.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:LOWer:SPACing LINear LOGarithmic :CALCulate[1]:LIMit[1] 2 ... 6:LOWer:SPACing?
Example	CALC:LIM:LOW:SPAC LIN CALC:LIM:LOW:SPAC?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1...8>:LOWer:SPACing LINear LOGarithmic
Preset	LIN

State Saved	Saved in instrument state.
Range	LINear LOGarithmic
CALCulate:LIMit:LOWer:THReshold The command defines an absolute threshold value for limit lines with relative Y-axis scaling. The absolute threshold value is used for the limit check when it exceeds the relative limit value. This mode supports only dBm units. The query returns the current value of this setting.	
Remote Command	CALCulate[1]:LIMit[1] 2 ... 6:LOWer:THReshold <amp1> CALCulate[1]:LIMit[1] 2 ... 6:LOWer:THReshold?
Example	CALC:LIM:LOW:THR 1DBM CALC:LIM:LOW:THR?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:LOWer:THReshold <numeric_value>
Preset	-200dBm

CALCulate:LIMit:UPPer Subsystem

The CALCulate:LIMit:UPPer subsystem controls the upper limit line.

NOTE

All limit functions are not supported in the CCDF and APD measurements.

CALCulate:LIMit:UPPer[:DATA]

The command defines a set of values for the specified upper limit line.

The query returns the current value set.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:UPPer[:DATA] <real>,<real>... :CALCulate[1]:LIMit[1] 2 ... 6:UPPer[:DATA]?
Example	CALC:LIM:UPP:DATA -10,0,0,-10,-5 CALC:LIM:UPP:DATA?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1...8>:UPPer[:DATA] <numeric_value>,<numeric_value>
State Saved	Saved in instrument state.

CALCulate:LIMit:UPPer:STATe

The command activates or deactivates the specified upper limit line. Limit check is activated separately, using CALC:LIM:STAT ON.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:UPPer:STATe ON OFF 1 0 :CALCulate[1]:LIMit[1] 2 ... 6:UPPer:STATe?
Example	CALC:LIM:UPP:STAT OFF CALC:LIM:UPP:STAT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:LIMit<1 to 8>:UPPer:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:LIMit:UPPer:OFFSet

The command defines an offset for the Y-axis of the specified relative upper limit line.

The query returns the current value of this setting.

Remote Command	CALCulate[1]:LIMit[1] 2 ... 6:UPPer:OFFSet <rel_amp1> CALCulate[1]:LIMit[1] 2 ... 6:UPPer:OFFSet?
Example	CALC:LIM:UPP:OFFS 1 CALC:LIM:UPP:OFFS?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:LIMit<1...8>:LOWer:SHIFt <numeric_value>
Preset	0

CALCulate:LIMit:UPPer:MARGin

The command defines a margin for the specified upper limit line. At the margin level, out-of-limit values are signaled (if the limit check is active), but are not treated as violations of the limit value.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:UPPer:MARGin <rel_amp1> :CALCulate[1]:LIMit[1] 2 ... 6:UPPer:MARGin?
Example	CALC:LIM:UPP:MARG 10 CALC:LIM:UPP:MARG?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:LIMit<1 to 8>:UPPer:MARGin <numeric_value>
Preset	0

CALCulate:LIMit:UPPer:MODE

The command switches between relative or absolute scaling for the Y-axis of the specified upper limit line.

Selecting RELative causes the unit to be switched to dB.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:UPPer:MODE RELative ABSolute :CALCulate[1]:LIMit[1] 2 ... 6:UPPer:MODE?
Example	CALC:LIM:UPP:MODE ABS CALC:LIM:UPP:MODE?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:LIMit<1 to 8>:UPPer:MODE RELative ABSolute
Preset	ABS
State Saved	Saved in instrument state.
Range	RELative ABSolute

CALCulate:LIMit:UPPer:SHIFt

The command shifts the specified limit line in the Y-direction by the specified amount.

The query returns the current value of this setting.

Remote Command	CALCulate[1]:LIMit[1] 2 ... 6:UPPer:SHIFt <rel_amp1> CALCulate[1]:LIMit[1] 2 ... 6:UPPer:SHIFt?
Example	CALC:LIM:UPP:SHIF 1 CALC:LIM:UPP:SHIF?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:LIMit<1 to 8>:UPPer:SHIFt <numeric_value>
Preset	0

CALCulate:LIMit:UPPer:SPACing

The command switches between linear or logarithmic interpolation for the upper limit line.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:UPPer:SPACing LINear LOGarithmic :CALCulate[1]:LIMit[1] 2 ... 6:UPPer:SPACing?
Example	CALC:LIM:UPP:SPAC LIN CALC:LIM:UPP:SPAC?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:UPPer:SPACing LINear LOGarithmic
Preset	LIN
State Saved	Saved in instrument state.
Range	LINear LOGarithmic

CALCulate:LIMit:UPPer:THReshold

The command specifies an absolute threshold value for limit lines with relative Y-axis scaling. The absolute threshold value is used for the limit check when it exceeds the relative limit value.

This mode supports only dBm units.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:LIMit[1] 2 ... 6:UPPer:THReshold <ampl> :CALCulate[1]:LIMit[1] 2 ... 6:UPPer:THReshold?
Example	CALC:LIM:UPP:THR 1DBM CALC:LIM:UPP:THR?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]2:LIMit<1 to 8>:UPPer:THReshold <numeric_value>
Preset	-200dBm

CALCulate:MARKer Subsystem

The CALCulate:MARKer subsystem controls marker functions in the instrument.

NOTE

All marker functions are not supported in the CCDF and APD measurements.

CALCulate:MARKer[:STATe]

The command switches the specified marker on or off.

If no numeric suffix is supplied, marker 1 is selected automatically.

If marker 2, 3 or 4 is selected and used as a delta marker, it is switched to marker mode.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:STATe ON OFF 1 0 :CALCulate[1]:MARKer[1] 2 ... 4:STATe?
Example	CALC:MARK3:STAT ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4[:STATe] ON OFF FSV CALCulate[1]:2:MARKer[1]:2 ... 16[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:MARKer:AOff

Turns off all active markers.

All delta markers are turned off.

All active marker and delta marker measurement functions are turned off.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:AOff
Example	CALC:MARK:AOff
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:AOff FSV CALCulate[1]:2:MARKer[1]:2 ... 16:AOff

CALCulate:MARKer:TRACe

The command assigns the specified marker to the trace defined by the command parameter.

If required, the corresponding marker is turned on.

The query returns the current assignment.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:TRACe 1 2 3 :CALCulate[1]:MARKer[1] 2 ... 4:TRACe?
Example	CALC:MARK:TRAC 2

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE CALCulate[1]:MARKer[1] 2 ... 4:TRACe 1 2 3 4 FSP, FSU, ESU CALCulate[1]:MARKer[1] 2 ... 4:TRACe 1 2 3 FSL CALCulate[1]:MARKer[1] 2 ... 4:TRACe 1 2 3 4 5 6 FSV CALCulate[1]:MARKer[1] 2 ... 16:TRACe 1 2 3 4 5 6
Preset	1
Min	1
Max	3

CALCulate:MARKer:X

The command places the selected marker at the indicated frequency, time, or level (for APD or CCDF measurements).

If marker 2, 3 or 4 is selected and used as delta marker, it is switched to marker mode.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:X <freq> <time> :CALCulate[1]:MARKer[1] 2 ... 4:X?
Example	CALC:MARK:X 1000000000 CALC:MARK:X?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:MARKer[1] 2 ... 4:X 0 to MAX (frequency sweep time) FSV CALCulate[1]:MARKer[1] 2 ... 16:X 0 to MAX (frequency sweep time)

CALCulate:MARKer:X:SLIMits[:STATe]

The command switches the search range limits on or off.

For this command, the numeric suffix after MARKer is ignored.

If time domain power measurement is active, this command limits the evaluation range on the trace.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:X:SLIMits[:STATe] ON OFF 1 0 :CALCulate[1]:MARKer[1] 2 ... 4:X:SLIMits[:STATe]?
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Example	CALC:MARK:X:SLIM:STAT ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:X:SLIMits[:STATe] ON OFF FSV CALCulate[1]:2:MARKer[1]:2 ... 16:X:SLIMits[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:MARKer:X:SLIMits:LEFT

The command sets the left limit of the search range for markers and delta markers.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:MARKer[1]:2 ... 4:X:SLIMits:LEFT <freq> <time> :CALCulate[1]:MARKer[1]:2 ... 4:X:SLIMits:LEFT?
Example	CALC:MARK:X:SLIM:LEFT 1MHZ CALC:MARK:X:SLIM:LEFT?
Remote Command Notes	FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:X:SLIMits:LEFT 0 to MAX (frequency sweep time) FSV CALCulate[1]:2:MARKer[1]:2 ... 16:X:SLIMits:LEFT 0 to MAX (frequency sweep time)

CALCulate:MARKer:X:SLIMits:RIGHT

The command sets the right limit of the search range for markers and delta markers.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:MARKer[1]:2 ... 4:X:SLIMits:RIGHT <freq> <time> :CALCulate[1]:MARKer[1]:2 ... 4:X:SLIMits:RIGHT?
Example	CALC:MARK:X:SLIM:RIGH 1MHZ CALC:MARK:X:SLIM:RIGH?
Remote Command Notes	FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:X:SLIMits:RIGHT 0 to MAX (frequency sweep time) FSV CALCulate[1]:2:MARKer[1]:2 ... 16:X:SLIMits:RIGHT 0 to MAX (frequency sweep time)

CALCulate:MARKer:COUNT

The command switches on or off operation of the frequency counter at the marker position.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:COUNT ON OFF 1 0 :CALCulate[1]:MARKer[1] 2 ... 4:COUNT?
Example	CALC:MARK:COUN ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:MARKer[1] 2 ... 4:COUNT ON OFF FSV CALCulate[1] 2:MARKer[1] 2 ... 16:COUNT ON OFF
Preset	OFF

CALCulate:MARKer:COUNT:RESolution

The command specifies the resolution of the frequency counter.

This mode supports the following resolutions: 1 | 10 | 100 | 1000 | 10000 | 100000 | 1000000 Hz.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:COUNT:RESolution <freq> :CALCulate[1]:MARKer[1] 2 ... 4:COUNT:RESolution?
Example	CALC:MARK:COUN:RES 1kHz CALC:MARK:COUN:RES?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:MARKer[1] 2 ... 4:COUNT:RESolution 0.1 1 10 100 1000 10000 Hz FSV CALCulate[1] 2:MARKer[1] 2 ... 16:COUNT:RESolution 0.001 0.01 0.1 1 10 100 1000 10000 Hz
Preset	1KHZ
Min	1
Max	1MHz

CALCulate:MARKer:COUNT:FREQuency?

Queries the frequency counter result for the specified marker.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:COUNT:FREQuency?
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Example	CALC:MARK:COUN:FREQ?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL :CALCulate[1]:MARKer[1]:2:...:4:COUNT:FREQuency? FSV :CALCulate[1]:MARKer[1]:2:...:16:COUNT:FREQuency?

CALCulate:MARKer:LOEXclude

The command switches local oscillator suppression for peak search on or off.

This setting is valid for all markers and delta markers.

The query returns the current state of this setting.

The numeric suffix after MARKer is irrelevant.

Remote Command	:CALCulate[1]:MARKer[1]:2 ...:4:LOEXclude ON OFF 1 0 :CALCulate[1]:MARKer[1]:2 ...:4:LOEXclude?
Example	CALC:MARK:LOEX ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:MARKer[1]:2:...:4:LOEXclude ON OFF FSV CALCulate[1]:MARKer[1]:2:...:16:LOEXclude ON OFF
Preset	ON
State Saved	Saved in instrument state.

CALCulate:MARKer:Y?

Queries the measured value of the specified marker.

If required, the marker is activated, or switched to marker mode.

Remote Command	:CALCulate[1]:MARKer[1]:2 ...:4:Y?
Example	CALC:MARK2:Y 1
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:MARKer[1]:2:...:4:Y? FSV CALCulate[1]:MARKer[1]:2:...:16:Y?

CALCulate:MARKer:Y:PERCent

This command positions the selected marker in the selected window to the given probability. If marker 2, 3 or 4 is selected and used as a delta marker, it is switched to marker mode.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:Y:PERCent <float> :CALCulate[1]:MARKer[1] 2 ... 4:Y:PERCent?
Example	CALC:MARK2:Y:PERC 95PCT
Remote Command Notes	FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:Y:PERCent 0 to100 FSV CALCulate[1]:2:MARKer[1]:2 ... 16:Y:PERCent 0 to100
Min	0
Max	100

CALCulate:MARKer:MAXimum[:PEAK]

Places the delta marker at the current maximum on the measured curve. If required, the delta marker is first activated.

This command is an event, and therefore has no *RST value and no query.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:MAXimum[:PEAK]
Example	CALC:MARK:MAX
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:MAXimum[:PEAK] FSV CALCulate[1]:2:MARKer[1]:2 ... 16:MAXimum[:PEAK]

CALCulate:MARKer:MAXimum:NEXT

Places the marker at the next smaller maximum value of the corresponding trace.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:MAXimum:NEXT
Example	CALC:MARK:MAX:NEXT
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:MAXimum:NEXT FSV CALCulate[1]:2:MARKer[1]:2 ... 16:MAXimum:NEXT

CALCulate:MARKer:MAXimum:LEFT

Places the marker at the next smaller maximum to the left of the current value (that is, in order of decreasing X values) on the trace.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:MAXimum:LEFT
Example	CALC:MARK:MAX:LEFT
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]2:MARKer[1]2 ... 4:MAXimum:LEFT FSV CALCulate[1]2:MARKer[1]2 ... 16:MAXimum:LEFT

CALCulate:MARKer:MAXimum:RIGHT

Places the delta marker at the next smaller maximum to the right of the current value (that is, in order of increasing X values). If required, the corresponding delta marker is first activated.

This command is an event, and therefore has no *RST value and no query.

Remote Command	CALCulate[1]:MARKer[1] 2 ... 4:MINimum:RIGHT
Example	CALC:MARK:MIN:RIGH
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]2:MARKer[1]2 ... 4:MAXimum:RIGHT FSV CALCulate[1]2:MARKer[1]2 ... 16:MAXimum:RIGHT

CALCulate:MARKer:MAXimum:AUTO

For marker 1, the command switches on or off operation of automatic maximum peak search at the end of each sweep.

The marker search limit settings are taken into account.

For this command, the numeric suffix of MARKer is ignored.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:MAXimum:AUTO ON OFF 1 0 :CALCulate[1]:MARKer[1] 2 ... 4:MAXimum:AUTO?
Example	CALC:MARK:MAX:AUTO ON CALC:MARK:MAX:AUTO?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSU, ESU, FSL CALCulate[1]:MARKer[1]:2:...:4:MAXimum:AUTO ON OFF FSV CALCulate[1]:MARKer[1]:2:...:16:MAXimum:AUTO ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:MARKer:MINimum:AUTO

For marker 1, the command switches on or off operation of automatic minimum peak search at the end of each sweep.

The marker search limit settings are taken into account.

For this command, the numeric suffix of MARKer is ignored.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:MARKer[1]:2 ...:4:MINimum:AUTO ON OFF 1 0 :CALCulate[1]:MARKer[1]:2 ...:4:MINimum:AUTO?
Example	CALC:MARK:MIN:AUTO ON CALC:MARK:MIN:AUTO?
Remote Command Notes	FSU, ESU, FSL CALCulate[1]:MARKer[1]:2:...:4:MINimum:AUTO ON OFF FSV CALCulate[1]:MARKer[1]:2:...:16:MINimum:AUTO ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:MARKer:MINimum[:PEAK]

Places the delta marker at the current maximum on the trace.

If required, the corresponding delta marker is first activated.

This command is an event, and therefore has no *RST value and no query.

Remote Command	:CALCulate[1]:MARKer[1]:2 ...:4:MINimum [:PEAK]
Example	CALC:MARK:MIN
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:MARKer[1]:2:...:4:MINimum[:PEAK] FSV CALCulate[1]:MARKer[1]:2:...:16:MINimum[:PEAK]

CALCulate:MARKer:MINimum:NEXT

Places the marker at the next smaller maximum of the corresponding trace.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:MINimum:NEXT
Example	CALC:MARK:MIN:NEXT
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]2:MARKer[1]2 ... 4:MINimum:NEXT FSV CALCulate[1]2:MARKer[1]2 ... 16:MINimum:NEXT

CALCulate:MARKer:MINimum:RIGHT

Places the delta marker at the next smaller maximum to the right of the current value (that is, in order of increasing X values).

If required, the corresponding delta marker is first activated.

This command is an event, and therefore has no *RST value and no query.

Remote Command	CALCulate[1]:MARKer[1] 2 ... 4:MAXimum:RIGHT
Example	CALC:MARK:MAX:RIGH
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]2:MARKer[1]2 ... 4:MINimum:RIGHT FSV CALCulate[1]2:MARKer[1]2 ... 16:MINimum:RIGHT

CALCulate:MARKer:MINimum:LEFT

Places the marker at the next smaller maximum to the left of the current value (that is, in order of decreasing X values) on the trace.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:MINimum:LEFT
Example	CALC:MARK:MIN:LEFT
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]2:MARKer[1]2 ... 4:MINimum:LEFT FSV CALCulate[1]2:MARKer[1]2 ... 16:MINimum:LEFT

CALCulate:MARKer:PEXCursion

The command specifies the peak excursion.

This mode supports only dB units.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:PEXCursion <rel_amp1> :CALCulate[1]:MARKer[1] 2 ... 4:PEXCursion?
Example	CALC:MARK:PEXC 10dB
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1] 2 ... 4:PEXCursion <numeric_value> FSV CALCulate[1]:2:MARKer[1] 2 ... 16:PEXCursion <numeric_value>
Preset	6dB
State Saved	Saved in instrument state.

CALCulate:MARKer:FUNCTION Subsystem

CALCulate:MARKer:FUNCTION:CENTer

This command sets the center frequency of the selected measurement window equal to the frequency of the indicated marker.

If marker 2, 3 or 4 is selected and used as delta marker, it is switched to the marker mode.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:CENTer
Example	CALC:MARK:FUNC:CENT
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1] 2 ... 4:FUNCTION:CENTer FSV CALCulate[1]:2:MARKer[1] 2 ... 16:FUNCTION:CENTer

CALCulate:MARKer:FUNCTION:CSTep

This command sets the step width of the center frequency in the selected measurement window to the X value of the current marker. If marker 2, 3 or 4 is selected and used as delta marker, it is

switched to the marker mode.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:CSTep
Example	CALC:MARK:FUNC:CST

Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2:...:4:FUNCTION:CSTep FSV CALCulate[1]:2:MARKer[1]:2:...:16:FUNCTION:CSTep
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CALCulate:MARKer:FUNCTION:FPEaks[:IMMediate]

This command searches the selected trace for the indicated number of maxima. The results are entered in a list and can be queried with commands CALC:MARK:FUNC:FPEaks:X? and CALC:MARK:FUNC:FPEaks:Y?. The number of maxima found can be queried with CALC:MARK:FUNC:FPEaks:COUNT?. The trace to be examined is selected with CALC:MARK:TRACE. The order of the results in the list can be defined with CALC:MARK:FUNC:FPEaks:SORT.

Note:

The number of maxima found depends on the waveform and value set for the Peak Excursion parameter (CALC:MARK:PEXC), however, a maximum number of 50 maxima are determined. Only the signals which exceed their surrounding values at least by the value indicated by the peak excursion parameter will be recognized as maxima. Therefore, the number of maxima found is not automatically the same as the number of maxima desired.

Remote Command	:CALCulate[1]:MARKer[1]:2 ...:4:FUNCTION:FPEaks[:IMMediate] <int> :CALCulate[1]:MARKer[1]:2 ...:4:FUNCTION:FPEaks[:IMMediate]?
Example	CALC:MARK:FUNC:FPE 5
Remote Command Notes	FSP, FSU, ESU CALCulate[1]:2:MARKer[1]:2:...:4:FUNCTION:FPEaks[:IMMediate] 0 to 50 FSL CALCulate[1]:2:MARKer[1]:2:...:4:FUNCTION:FPEaks[:IMMediate] 0 to 200 FSV CALCulate[1]:2:MARKer[1]:2:...:16:FUNCTION:FPEaks[:IMMediate] 0 to 200
Preset	0

CALCulate:MARKer:FUNCTION:FPEaks:COUNT?

This query reads out the number of maxima found during the search. If no search for maxima has been performed, 0 is returned.

Remote Command	:CALCulate[1]:MARKer[1]:2 ...:4:FUNCTION:FPEaks:COUNT?
Example	CALC:MARK:FUNC:FPE:COUN?

Remote Command Notes	FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2:...:4:FUNCTION:FPEaks:COUNT? FSV CALCulate[1]:2:MARKer[1]:2:...:16:FUNCTION:FPEaks:COUNT?
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CALCulate:MARKer:FUNCTION:FPEaks:X?

This query reads out the list of X values of the maxima found. The number of available values can be queried with CALC:MARK:FUNC:FPEaks:COUNT?.

With sort mode X, the X values are in increasing order; with sort mode Y the order corresponds to the decreasing order of the Y values.

Remote Command	:CALCulate[1]:MARKer[1]:2:...:4:FUNCTION:FPEaks:X?
Example	CALC:MARK:FUNC:FPE:X?
Remote Command Notes	FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2:...:4:FUNCTION:FPEaks:X? FSV CALCulate[1]:2:MARKer[1]:2:...:16:FUNCTION:FPEaks:X?

CALCulate:MARKer:FUNCTION:FPEaks:Y?

This query reads out the list of X values of the maxima found. The number of available values can be queried with CALC:MARK:FUNC:FPEaks:COUNT?.

With sort mode X, the X values are in increasing order; with sort mode Y the order corresponds to the decreasing order of the Y values.

Remote Command	:CALCulate[1]:MARKer[1]:2:...:4:FUNCTION:FPEaks:Y?
Example	CALC:MARK:FUNC:FPE:Y?
Remote Command Notes	FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2:...:4:FUNCTION:FPEaks:Y? FSV CALCulate[1]:2:MARKer[1]:2:...:16:FUNCTION:FPEaks:Y?

CALCulate:MARKer:FUNCTION:FPEaks:SORT

This command sets the sort mode for the search for maxima:

X the maxima are sorted in the list of responses according to increasing X values

Y the maxima are sorted in the list of responses according to decreasing Y values

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:FPEaks:SORT X Y :CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:FPEaks:SORT?
Example	CALC:MARK:FUNC:FPE:SORT X CALC:MARK:FUNC:FPE:SORT?
Remote Command Notes	FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1] 2 ... 4:FUNCTION:FPEaks:SORT X Y FSV CALCulate[1]:2:MARKer[1] 2 ... 16:FUNCTION:FPEaks:SORT X Y

CALCulate:MARKer:FUNCTION:SUMMARY:RMS[:STATe]

This command switches on or off the measurement of the effective (RMS) power in the selected measurement window. If necessary the function is switched on previously.

The function is independent of the marker selection, i.e. the numeric suffix of MARKer is irrelevant. It is only available in the time domain (span = 0).

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:SUMMARY:RMS[:STATe] ON OFF 1 0 :CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:SUMMARY:RMS[:STATe]?
Example	CALC:MARK:FUNC:SUMM:RMS ON CALC:MARK:FUNC:SUMM:RMS?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1] 2 ... 4:FUNCTION:SUMMARY:RMS[:STATe] ON OFF FSV CALCulate[1]:2:MARKer[1] 2 ... 4:FUNCTION:SUMMARY:RMS[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:MARKer:FUNCTION:SUMMARY:RMS:RESult?

This command queries the result of the measurement of the RMS power value in the selected measurement window.

The function is independent of the marker selection, i.e. the numeric suffix of :MARKer is irrelevant. It is only available in the time domain (span = 0).

A complete sweep with synchronization to sweep end must be performed between switching on the function and querying the measured value to obtain a valid query result. This is only possible in single sweep mode.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:SUMMARY:RMS:RESult?
Example	CALC:MARK:FUNC:SUMM:RMS:RES?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:FUNCTION:SUMMARY:RMS:RESult? FSV CALCulate[1]:2:MARKer[1]:2 ... 16:FUNCTION:SUMMARY:RMS:RESult?

CALCulate:MARKer:FUNCTION:NOISE[:STATe]

The command switches noise measurement on or off for all markers.

The noise power density is measured at the marker positions. The result may be queried using CALCulate:MARKer:FUNCTION:NOISE:RESult?.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:NOISE[:STATe] ON OFF 1 0 :CALCulate[1]:DELTaMarker[1] 2 ... 4:FUNCTION:NOISE[:STATe]?
Example	CALC:MARK:FUNC:NOIS ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:FUNCTION:NOISE[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:MARKer:FUNCTION:NOISE:RESult?

Queries the noise measurement result.

To obtain a valid result, a complete sweep must be performed after switching on the function, but before querying the measured value. This is possible only in Single sweep mode.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:NOISE:RESult?
Example	CALC:MARK:FUNC:NOIS:RES?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:FUNCTION:NOISE:RESult? FSV CALCulate[1]:2:MARKer[1]:2 ... 16:FUNCTION:NOISE:RESult?

CALCulate:MARKer:FUNCTION:REFerence

Sets the reference level to the power measured by the specified marker.

If marker 2, 3 or 4 is selected, and used as delta marker, it is switched to marker mode.

This command is an event, and therefore has neither *RST value nor query.

The value of the numeric suffix [1]|2|3|4 is ignored.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:REFerence
Example	CALC:MARK:FUNC:REF
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:MARKer[1] 2 ... 4:FUNCTION:REFerence FSV CALCulate[1] 2:MARKer[1] 2 ... 16:FUNCTION:REFerence

CALCulate:MARKer:FUNCTION:POWER Subsystem

The CALCulate:MARKer:FUNCTION:POWER subsystem includes commands for control of power measurement.

CALCulate:MARKer:FUNCTION:POWER:SElect

Selects and activates the specified power measurement type.

This mode supports: ACPower, MCACpower, CPOWER, OBANdwidth and OBWidth.

Remote Command	CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:POWER:SElect ACPower CPOWER MCACpower OBANdwidth OBWidth CN CN0
Example	CALC:MARK:FUNC:POW:SEL OBW
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1] 2:MARKer[1] 2 ... 4:FUNCTION:POWER:SElect ACPower CPOWER MCACpower OBANdwidth OBWidth CN CN0 FSV CALCulate[1] 2:MARKer[1] 2 ... 16:FUNCTION:POWER:SElect ACPower CPOWER MCACpower OBANdwidth OBWidth CN CN0

CALCulate:MARKer:FUNCTION:POWER:RESult?

Queries the result for the specified power measurement type.

Compatible SCPI Commands

Supported SCPI Commands

This mode supports ACPower, CPOWer, MCACpower, OBANdwidth and OBWidth.

Remote Command	CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:POWer:RESult? ACPower CPOWer MCACpower OBANdwidth OBWidth CN CN0
Example	CALC:MARK:FUNC:POW:RES? OBW
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:FUNCTION:POWer:RESult? ACPower CPOWer MCACpower OBANdwidth OBWidth CN CN0 FSV CALCulate[1]:2:MARKer[1]:2 ... 16:FUNCTION:POWer:RESult? ACPower CPOWer MCACpower OBANdwidth OBWidth CN CN0

CALCulate:MARKer:FUNCTION:POWer:RESult:PHZ

The command switches the query response for power measurement results between absolute values (OFF) and output referred to measurement bandwidth (ON).

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:POWer:RESult:PHZ ON OFF 1 0 :CALCulate[1]:MARKer[1] 2 ... 4:FUNCTION:POWer:RESult:PHZ?
Example	CALC:MARK:FUNC:POW:RES:PHZ OFF CALC:MARK:FUNC:POW:RES:PHZ?
Remote Command Notes	FSP, FSU, ESU, FSL CALCulate[1]:2:MARKer[1]:2 ... 4:FUNCTION:POWer:RESult:PHZ ON OFF FSV CALCulate[1]:2:MARKer[1]:2 ... 16:FUNCTION:POWer:RESult:PHZ ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:STATistics Subsystem

The CALCulate:STATistics subsystem controls the statistical measurement functionality.

CALCulate:STATistics:APD[:STATE]

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate:STATistics:APD:STATE ON OFF 1 0 :CALCulate:STATistics:APD:STATE?
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Example	CALC:STAT:APD:STAT ON
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:STATistics:APD[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:STATistics:CCDF[:STATe]

The command activates or deactivates measurement of the complementary cumulative distribution function (CCDF).

When this function is activated, the APD measurement is turned off.

The query returns the current state of this setting.

Remote Command	:CALCulate:STATistics:CCDF:STATe ON OFF 1 0 :CALCulate:STATistics:CCDF:STATe?
Example	CALC:STAT:CCDF:STAT ON
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:STATistics:CCDF[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:STATistics:CCDF:X?

Queries the level values for the probabilities 0.01%, 0.1%, 1% and 10%.

Remote Command	CALCulate:STATistics:CCDF:X[1] 2 3? P0_01 P0_1 P1 P10
Example	CALC:STAT:CCDF:X? P10
Remote Command Notes	FSU, ESU CALCulate[1]:2:STATistics:CCDF:X[1]:2 3? P0_01 P0_1 P1 P10 FSV CALCulate[1]:2:STATistics:CCDF:X[1]:2 ... 6? P0_01 P0_1 P1 P10

CALCulate:STATistics:NSAMPles

The command specifies the number of measurement points to be acquired for the statistical measurement functions.

The minimum value supported by this mode is 1000.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:STATistics:NSAMples <int> :CALCulate[1]:STATistics:NSAMples?
Example	CALC:STAT:NSAM 100000 CALC:STAT:NSAM?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:STATistics:NSAMples 100 to 1E9
Preset	100000
State Saved	Saved in instrument state.
Min	1000
Max	1E9

CALCulate:STATistics:SCALE:AUTO

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:STATistics:SCALE:AUTO ONCE
Example	CALC:STAT:SCAL:AUTO ONCE
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:STATistics:SCALE:AUTO ONCE

CALCulate:STATistics:SCALE:X:RLEVel

Specifies the reference level for the X-axis of the measurement display. The setting is identical to the reference level setting using the command DISPlay:WINDow:TRACe:Y: RLEVel.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:STATistics:SCALE:X:RLEVel < amp1> :CALCulate[1]:STATistics:SCALE:X:RLEVel?
Example	CALC:STAT:SCAL:X:RLEV -60dBm CALC:STAT:SCAL:X:RLEV?
Remote Command Notes	FSP, FSU, ESU CALCulate[1]:2:STATistics:SCALE:X:RLEVel -130dBm to 30dBm FSL, FSV CALCulate[1]:2:STATistics:SCALE:X:RLEVel -120dBm to 20dBm
Preset	-20dBm
State Saved	Saved in instrument state.

Min	-130
Max	30

CALCulate:STATistics:SCALE:X:RANGe

Specifies the level range for the X-axis of the measurement display. The setting is identical to the level range setting defined with the command DISPlay:WINDow:TRACe:Y:SCALE.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:STATistics:SCALE:X:RANGe <rel_ampl> :CALCulate[1]:STATistics:SCALE:X:RANGe?
Example	CALC:STAT:SCAL:X:RANG 20dB CALC:STAT:SCAL:X:RANG?
Remote Command Notes	FSP, FSL, FSV CALCulate[1]2:STATistics:SCALE:X:RANGe 10dB to 200dB FSU, ESU CALCulate[1]2:STATistics:SCALE:X:RANGe 1dB to 200dB
Preset	100dB
State Saved	Saved in instrument state.
Min	10
Max	200

CALCulate:STATistics:SCALE:Y:UPPer

Specifies the upper limit for the Y-axis of the display, in statistical measurements. Since probabilities are specified on the Y axis, the entered numerical values are dimensionless.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:STATistics:SCALE:Y:UPPer <real> :CALCulate[1]:STATistics:SCALE:Y:UPPer?
Example	CALC:STAT:SCAL:Y:UPP 0.01 CALC:STAT:SCAL:Y:UPP?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]2:STATistics:SCALE:Y:UPPer 1E-8 to 1.0
Preset	1.0
State Saved	Saved in instrument state.

Min	1e-8
Max	1.0

CALCulate:STATistics:SCALE:Y:LOWer

Specifies the lower limit for the Y-axis of the display, in statistical measurements. Since probabilities are specified on the Y axis, the entered numerical values are dimensionless.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:STATistics:SCALE:Y:LOWer <real> :CALCulate[1]:STATistics:SCALE:Y:LOWer?
Example	CALC:STAT:SCALE:Y:LOW 0.001 CALC:STAT:SCALE:Y:LOW?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]2:STATistics:SCALE:Y:LOWer 1E-9 to 0.1
Preset	1e-6
State Saved	Saved in instrument state.
Min	1e-9
Max	0.1

CALCulate:STATistics:PRESet

Resets the scaling of the X- and Y-axes in a statistical measurement. The following values are set:

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:STATistics:PRESet
Example	CALC:STAT:PRES
Remote Command Notes	FSP, FSU, ESU, FSL, FSV CALCulate[1]2:STATistics:PRESet

CALCulate:STATistics:RESult?

Queries the results of statistical measurements of a recorded trace.

Currently, only TRACE1 is valid for CCDF measurements.

Remote Command	CALCulate:STATistics:RESult? MEAN PEAK CFACtor ALL
Example	CALC:STAT:RES? ALL

Remote Command Notes FSP, FSU, ESU, FSL
CALCulate[1]:STATistics:RESult[1]:2|3? MEAN | PEAK | CFACtor | ALL

CALCulate:THReshold Subsystem

The CALCulate:THReshold subsystem controls the threshold value for maximum/minimum marker searches.

CALCulate:DLINe

Specifies the position of Display Line 1 or 2. These lines enable the user to mark any levels in the diagram. The unit depends on the setting made with CALC:UNIT.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:DLINe[1] 2 <amp1> :CALCulate[1]:DLINe[1] 2?
Example	CALC:DLIN -20DBM
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:DLINe[1]:2 MINimum to MAXimum (depending on current unit)
State Saved	Saved in instrument state.

CALCulate:DLINe:STATe

The command turns Display Line 1 or 2 (level lines) on or off.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:DLINe[1]:2:STATe ON OFF 1 0 :CALCulate[1]:DLINe[1]:2:STATe?
Example	CALC:DLIN:STAT ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:DLINe[1]:2:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:THReshold

The command specifies the threshold value for the maximum/minimum search of markers with marker search functions MAX PEAK, NEXT PEAK, etc.

The associated display line is automatically turned on.

The query returns the current value of this setting.

Remote Command	:CALCulate[1]:THReshold <amp1> :CALCulate[1]:THReshold?
Example	CALC:THR -82DBM
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:THReshold MINimum to MAXimum (depending on current unit)
State Saved	Saved in instrument state.

CALCulate:THReshold:STATe

The command turns the threshold line on or off.

The unit depends on the setting performed by CALC:UNIT.

The query returns the current state of this setting.

Remote Command	:CALCulate[1]:THReshold:STATe ON OFF 1 0 :CALCulate[1]:THReshold:STATe?
Example	CALC:THR:STAT ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:THReshold:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:FLINe

Specifies the position of the frequency lines.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:FLINe[1] 2 <freq> :CALCulate[1]:FLINe[1] 2?
Example	CALC:FLIN 120MHz
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:FLINe[1] 2 0 to fmax
State Saved	Saved in instrument state.

CALCulate:FLINe:STATe

Switches the frequency line on or off.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:FLINe[1] 2:STATe ON OFF 1 0 :CALCulate[1]:FLINe[1] 2:STATe?
Example	CALC:FLIN:STAT ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:FLINe[1]:2:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:TLINe

Specifies the position of the time lines.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:TLINe[1] 2 <time> :CALCulate[1]:TLINe[1] 2?
Example	CALC:TLIN 10ms
Remote Command Notes	FSE, FSP, FSU, ESU, FSL CALCulate[1]:2:TLINe[1]:2 0 to 1000s FSV CALCulate[1]:2:TLINe[1]:2 0 to 30000000000s
State Saved	Saved in instrument state.

CALCulate:TLINe:STATe

Switches the time line on or off.

This command is accepted, but takes no action and reports no error.

Remote Command	:CALCulate[1]:TLINe[1] 2:STATe ON OFF 1 0 :CALCulate[1]:TLINe[1] 2:STATe?
Example	CALC:TLIN:STAT ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALCulate[1]:2:TLINe[1]:2:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

CALCulate:UNIT Subsystem

The CALCulate:UNIT subsystem specifies the units for power measurement settings.

CALCulate:UNIT:POWer

The command selects the power units.

This mode supports the following unit parameters: DBM | DBUV | DBMV | DBPW | DBUA | V | A | W.

The query returns the current unit selection.

Remote Command	:CALCulate[1]:UNIT:POWer DBM DBUV DBMV DBPW DBUA V A W :CALCulate[1]:UNIT:POWer?
Example	CALC:UNIT:POW DBM
Remote Command Notes	FSE CALCulate[1]:2:UNIT:POWer DBM V W DB PCT DBPT UNITLESS DBPW WATT DBUV DBMV VOLT DBUA AMPere DBUV_MHZ DBMV_MHZ DBUA_MHZ DBUV_M DBUA_M DBUV_MMHZ DBUA_MMHZ FSP CALCulate[1]:2:UNIT:POWer DBM V A W DB PCT UNITLESS DBPW WATT DBUV DBMV VOLT DBUA AMPere FSU, ESU CALCulate[1]:2:UNIT:POWer DBM V A W DBPW WATT DBUV DBMV VOLT DBUA AMPere DBPT DBUV_M DBUA_M FSL CALCulate[1]:2:UNIT:POWer DBM V A W DBPW WATT DBPT DBUV DBMV VOLT DBUA AMPere FSV CALCulate[1]:2:UNIT:POWer DBM V A W DBPW WATT DBUV DBMV VOLT DBUA AMPere
Preset	DBM
State Saved	Saved in instrument state.
Range	DBM DBUV DBMV DBPW DBUA V A W
Backward Compatibility	UNIT[1]:2:POWer

dBm Sets the unit for the selected amplitude scale (log/lin) to dBm.

Remote Command Example UNIT:POW DBM

dBpW Sets the unit for the selected amplitude scale (log/lin) to dBpW.

Remote Command Example UNIT:POW DBPW

dBmV Sets the unit for the selected amplitude scale (log/lin) to dBmV.

Remote Command Example UNIT:POW DBMV

W Sets the unit for the selected amplitude scale (log/lin) to Watt.

Remote Command Example UNIT:POW W

V Sets the unit for the selected amplitude scale (log/lin) to Volt.

Remote Command Example UNIT:POW V

A Sets the unit for the selected amplitude scale (log/lin) to Ampere.

Remote Command Example **UNIT:POW A**

dBμV Sets the unit for the selected amplitude scale (log/lin) to dBμV.

Remote Command Example UNIT:POW DBUV

dBμA Sets the unit for the selected amplitude scale (log/lin) to dBμA.

Remote Command Example UNIT:POW DBUA

CALibration Subsystem

The CALibration subsystem specifies the data for system error correction.

CALibration[:ALL]?

Initiates the acquisition of system error correction data.

If the acquisition was successful, "0" is returned.

Remote Command	:CALibration[:ALL]?
Example	:CAL?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALibration[:ALL]?

CALibration:STATe

Specifies whether the current calibration data is to be taken into account by the instrument (ON) or not (OFF).

Remote Command	:CALibration:STATe ON OFF 1 0
Example	CAL:STAT OFF
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV CALibration:STATe ON OFF
Preset	ON
State Saved	No

DISPlay Subsystem

The DISPlay subsystem commands control the selection and presentation of textual and graphical information and measurement data.

This mode does not support the screen display function. All DISPlay-related SCPI commands are accepted, but take no action and report no error.

DISPlay:FORMat

Switches the measurement result display between FULL SCREEN and SPLIT SCREEN.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:FORMat SINGLE SPLit :DISPlay:FORMat?
Example	DISP:FORM SING
Remote Command Notes	FSE, FSP, FSU, ESU, FSL DISPlay:FORMat SINGLE SPLit
Preset	SINGLE
State Saved	Saved in instrument state.
Range	SINGLE SPLit

DISPlay:ANNotation:FREQuency

Switches X-axis annotation on or off.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:ANNotation:FREQuency ON OFF 1 0 :DISPlay:ANNotation:FREQuency?
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Compatible SCPI Commands

Supported SCPI Commands

Example	DISP:ANN:FREQ OFF DISP:ANN:FREQ?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV DISPlay:ANNotation:FREQuency ON OFF
Preset	ON
State Saved	Saved in instrument state.

DISPlay:LOGO

Switches the on-screen company logo on or off.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:LOGO ON OFF 1 0 :DISPlay:LOGO?
Example	DISP:LOGO OFF DISP:LOGO?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV DISPlay:LOGO ON OFF
Preset	ON
State Saved	Saved in instrument state.

DISPlay:PSAVe[:STATe]

Switches the display power-save mode on or off.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:PSAVe[:STATe] ON OFF 1 0 :DISPlay:PSAVe[:STATe]?
Example	DISP:PSAV OFF DISP:PSAV?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV DISPlay:PSAVe[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

DISPlay:PSAVe:HOLDoff

Specifies the holdoff time for the display's power-save mode.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:PSAVe:HOLDoff <int> :DISPlay:PSAVe:HOLDoff?
Example	DISP:PSAV:HOLD 30 DISP:PSAV:HOLD?
Remote Command Notes	FSE DISPlay: PSAVe:HOLDoff <1 ... 100> FSP, FSU, ESU, FSL, FSV DISPlay: PSAVe:HOLDoff <1 ... 60>
Preset	FSE 1 FSP, FSU, ESU, FSL, FSV 15
Min	1
Max	60

DISPlay:CMAP:DEFAult

Resets the display's screen colors to their defaults.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:CMAP[1] 2 ... 26:DEFAult[1] 2
Example	DISP:CMAP:DEF
Remote Command Notes	FSE DISPlay:CMAP[1] 2 ... 13:DEFAult FSP, FSU, ESU, FSL DISPlay:CMAP[1] 2 ... 26:DEFAult[1] 2 FSV DISPlay:CMAP[1] 2 ... 41:DEFAult[1] 2

DISPlay:CMAP:HSL

Defines the instrument's color map.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:CMAP[1] 2 ... 26:HSL <real>,<real>,<real> :DISPlay:CMAP[1] 2 ... 26:HSL?
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Compatible SCPI Commands

Supported SCPI Commands

Example	DISP:CMAP:HSL 0.3,0.8,1.0 DISP:CMAP:HSL?
Remote Command Notes	FSE DISPlay:CMAP[1]2 ... 13:HSL < 0.0 to 1.0>,< 0.0 to 1.0>,< 0.0 to 1.0> FSP, FSU, ESU, FSL DISPlay:CMAP[1]2 ... 26:HSL < 0.0 to 1.0>,< 0.0 to 1.0>,< 0.0 to 1.0> FSV DISPlay:CMAP[1]2 ... 41:HSL < 0.0 to 1.0>,< 0.0 to 1.0>,< 0.0 to 1.0>
State Saved	Saved in instrument state.

DISPlay:CMAP:PDEFined

Specifies predefined color values for the instrument's color map.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:CMAP[1]2 ... 26:PDEFined BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLue LGREen LCYan LRED LMAGenta :DISPlay:CMAP[1]2 ... 26:PDEFined?
Example	DISP:CMAP:PDEF BLAC DISP:CMAP:PDEF?
Remote Command Notes	FSE, DISPlay:CMAP[1]2 ... 13:PDEFined BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLue LGREen LCYan LRED LMAGenta FSP, FSU, ESU, FSL DISPlay:CMAP[1]2 ... 26:PDEFined BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLue LGREen LCYan LRED LMAGenta FSV DISPlay:CMAP[1]2 ... 41:PDEFined BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLue LGREen LCYan LRED LMAGenta
State Saved	Saved in instrument state.
Range	BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLue LGREen LCYan LRED LMAGenta

DISPlay[:WINDow]:SElect

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:WINDow[1]:SElect
Example	DISP:WIND:SEL
Remote Command Notes	FSE, FSP, FSU, ESU DISPlay[:WINDow[1]]2]:SElect
Backwards Compatibility SCPI	:DISPlay:SElect

DISPlay[:WINDow]:SIZE

Switches the measurement window between full screen and half screen.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:WINDow[1]:SIZE LARGE SMALL :DISPlay:WINDow[1]:TRACe[1] 2 3:MODE?
Example	DISP:WIND:SIZE LARG DISP:WIND:SIZE?
Remote Command Notes	FSU, ESU, FSL DISPlay[:WINDow[1]]2]:SIZE LARGE SMALL
Preset	SMALL
State Saved	Saved in instrument state.
Range	LARGE SMALL
Backwards Compatibility SCPI	:DISPlay:SIZE

DISPlay[:WINDow]:TEXT[:DATA]

Specifies a comment (max. 20 characters) that can be displayed on the screen.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:WINDow[1]:TEXT[:DATA] <string> :DISPlay:WINDow[1]:TEXT[:DATA]?
Example	DISP:WIND:TEXT:DATA "123" DISP:WIND:TEXT:DATA?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV DISPlay[:WINDow[1]]2]:TEXT[:DATA] <string>
Preset	"
State Saved	Saved in instrument state.

Backwards Compatibility SCPI :DISPlay:TEXT[:DATA]

DISPlay[:WINDow]:TEXT:STATe

Switches display of the comment (screen title) on or off.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:WINDow[1]:TEXT :STATe ON OFF 1 0 :DISPlay:WINDow[1]:TEXT :STATe?
Example	DISP:WIND:TEXT:STAT ON DISP:WIND:TEXT:STAT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV DISPlay[:WINDow[1]]2]:TEXT:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.
Backwards Compatibility SCPI	:DISPlay:TEXT:STATe

DISPlay[:WINDow]:TIME

Switches on-screen display of date and time on or off.

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:WINDow[1]:TIME ON OFF 1 0 :DISPlay:WINDow[1]:TIME?
Example	DISP:WIND:TIME ON DISP:WIND:TIME?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV DISPlay[:WINDow[1]]2]:TIME ON OFF
Preset	OFF
State Saved	Saved in instrument state.
Backwards Compatibility SCPI	:DISPlay:TIME

DISPlay[:WINDow]:TRACe:Y[:SCALe]

The command specifies the display range of the Y-axis (level axis) with logarithmic scaling (DISP:TRAC:Y:SPAC LOG).

The query returns the current value of this setting.

Remote Command	DISPlay:WINDow[1]:TRACe[1] 2 3:Y[:SCALE] <rel_amp1> DISPlay:WINDow[1]:TRACe[1] 2 3:Y[:SCALE]?
Example	DISP:WIND:TRAC:Y 20dB DISP:WIND:TRAC:Y?
Remote Command Notes	FSE, DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 4:Y[:SCALE] 10dB to 200dB FSP, FSU, ESU DISPlay[:WINDow[1] 2]:TRACe[1] 2 3:Y[:SCALE] 10dB to 200dB FSL, FSV DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 6:Y[:SCALE] 10dB to 200dB
Preset	100dB
Min	10dB
Max	200dB
Backwards Compatibility SCPI	:DISPlay[1]:TRACe[1] 2 3:Y[:SCALE]

DISPlay[:WINDow]:TRACe:Y[:SCALE]:MODE

Specifies the scale type of the Y-axis (absolute or relative).

This command is accepted, but takes no action and reports no error.

Remote Command	:DISPlay:WINDow[1]:TRACe:Y[:SCALE]:MODE ABSolute RELative :DISPlay:WINDow[1]:TRACe:Y[:SCALE]:MODE?
Example	DISP:WIND:TRAC:Y:MODE ABS DISP:WIND:TRAC:Y:MODE?
Remote Command Notes	FSE, DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 4:Y[:SCALE]:MODE ABSolute RELative FSP, FSU, ESU DISPlay[:WINDow[1] 2]:TRACe[1] 2 3:Y[:SCALE]:MODE ABSolute RELative FSL, FSV DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 6:Y[:SCALE]:MODE ABSolute RELative
Preset	ABS
State Saved	Saved in instrument state.
Range	ABSolute RELative
Backwards Compatibility SCPI	:DISPlay[1]:TRACe[1] 2 3:Y[:SCALE]:MODE

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

The command specifies the reference level.

The query returns the current value of this setting.

Remote Command	:DISPlay:WINDow[1]:TRACe[1] 2 3:Y[:SCALe]:RLEVel <amp1> :DISPlay:WINDow[1]:TRACe[1] 2 3:Y[:SCALe]:RLEVel?
Example	DISP:TRAC:Y:RLEV 20dBm
Remote Command Notes	FSE DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 4:Y[:SCALe]:RLEVel -200dBm to 200dBm FSP, FSU, ESU DISPlay[:WINDow[1] 2]:TRACe[1] 2 3:Y[:SCALe]:RLEVel -130dBm to 30dBm FSL, FSV DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 6:Y[:SCALe]:RLEVel <numeric_value> in dBm
Preset	FSE, FSP,FSU, ESU, FSL -20 dBm FSV -10dBm
State Saved	Saved in instrument state.
Min	-130 dBm
Max	30 dBm
Backwards Compatibility SCPI	:DISPlay:TRACe[1] 2 3:Y[:SCALe]:RLEVel

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

The command specifies the offset of the reference level.

The query returns the current value of this setting.

Remote Command	:DISPlay:WINDow[1]:TRACe[1] 2 3:Y[:SCALe]:RLEVel:OFFSet <rel_amp1> :DISPlay:WINDow[1]:TRACe[1] 2 3:Y[:SCALe]:RLEVel:OFFSet?
Example	DISP:TRAC:Y:RLEV:OFFS -10dB
Remote Command Notes	FSE, DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 4:Y[:SCALe]:RLEVel:OFFSet -200dB to 200dB FSP, FSU, ESU DISPlay[:WINDow[1] 2]:TRACe[1] 2 3:Y[:SCALe]:RLEVel:OFFSet -200dB to 200dB FSL, FSV DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 6:Y[:SCALe]:RLEVel:OFFSet -200dB to 200dB

Compatible SCPI Commands
Supported SCPI Commands

Preset	0 dB
State Saved	Saved in instrument state.
Min	-200.0 dB
Max	200 dB
Backwards Compatibility SCPI	:DISPlay:TRACe[1] 2 3:Y[:SCALE]:RLEVel:OFFSet

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

The command specifies the scaling of the Y-axis, using the currently-selected unit.

This mode supports only dB units.

The query returns the current value of this setting.

Remote Command	DISPlay:WINDow[1]:TRACe:Y[:SCALE]:PDIVision <rel_ampl> DISPlay:WINDow[1]:TRACe:Y[:SCALE]:PDIVision?
Example	DISP:WIND:TRAC:Y:PDIV 5 DISP:WIND:TRAC:Y:PDIV?
Remote Command Notes	FSE, DISPlay[:WINDow[1] 2]:TRACe[1] 2 ... 4:Y[:SCALE]:PDIVision <numeric_value> FSP DISPlay[:WINDow[1] 2]:TRACe[1] 2 3:Y[:SCALE]:PDIVision <numeric_value>
State Saved	Saved in instrument state.
Backwards Compatibility SCPI	:DISPlay[1]:TRACe[1] 2 3:Y[:SCALE]:PDIVision

DISPlay[:WINDow]:TRACe:Y:SPACing

The command switches between linear and logarithmic display.

This mode does not support the parameter option LDB.

The query returns the current state of this setting.

Remote Command	:DISPlay:WINDow[1]:TRACe[1] 2 3:Y:SPACing LINear LOGarithmic :DISPlay:WINDow[1]:TRACe[1] 2 3:Y:SPACing?
Example	DISP:WIND:TRAC:Y:SPAC LOG DISP:WIND:TRAC:Y:SPAC?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE, DISPlay[:WINDow[1]]2]:TRACe[1]]2]...[4:Y:SPACing LINear LOGarithmic PERCent FSP DISPlay[:WINDow[1]]2]:TRACe[1]]2]3:Y:SPACing LINear LOGarithmic FSU, ESU DISPlay[:WINDow[1]]2]:TRACe[1]]2]3:Y:SPACing LINear LOGarithmic LDB FSL, FSV DISPlay[:WINDow[1]]2]:TRACe[1]]2]...[6:Y:SPACing LINear LOGarithmic LDB
Preset	LOG
State Saved	Saved in instrument state.
Backwards Compatibility SCPI	:DISPlay[1]:TRACe[1]]2]3:Y:SPACing

DISPlay[:WINDow]:TRACe:MODE

The command specifies the display type and evaluation mode for the specified trace.

The query returns the current state of this setting for the specified trace.

Remote Command	:DISPlay:WINDow[1]:TRACe[1]]2]3:MODE WRITe VIEW AVERAge MAXHold MINHold :DISPlay:WINDow[1]:TRACe[1]]2]3:MODE?
Example	DISP:WIND1:TRAC:MODE WRIT
Remote Command Notes	FSE, DISPlay[:WINDow[1]]2]:TRACe[1]]2]...[4:MODE WRITe VIEW AVERAge MAXHold MINHold FSP, FSU, ESU DISPlay[:WINDow[1]]2]:TRACe[1]]2]3:MODE WRITe VIEW AVERAge MAXHold MINHold FSL, FSV DISPlay[:WINDow[1]]2]:TRACe[1]]2]...[6:MODE WRITe VIEW AVERAge MAXHold MINHold RMS
Preset	WRITe
State Saved	Saved in instrument state.
Range	WRITe VIEW AVERAge MAXHold MINHold
Backwards Compatibility SCPI	:DISPlay:TRACe[1]]2]3:MODE

DISPlay[:WINDow]:TRACe[:STATe]

The command switches on or off display of the corresponding trace.

The query returns the current state of this setting.

Remote Command	:DISPlay[1]:WINDow[1]:TRACe[1] 2 3[:STATe] ON OFF 1 0 :DISPlay[1]:WINDow[1]:TRACe[1] 2 3[:STATe]?
Example	DISP:TRAC1 ON
Remote Command Notes	FSE, DISPlay[:WINDow[1]]2]:TRACe[1]]2]...[4[:STATe] ON OFF FSP, FSU, ESU DISPlay[:WINDow[1]]2]:TRACe[1]]2]3[:STATe] ON OFF FSL, FSV DISPlay[:WINDow[1]]2]:TRACe[1]]2]...[6[:STATe] ON OFF
Preset	ON for Trace 1, OFF for the others
State Saved	Saved in instrument state.
Backwards Compatibility SCPI	:DISPlay[1]:TRACe[1]]2]3[:STATe]

FORMat Subsystem

The FORMat subsystem specifies the format of data transmitted from and received by the instrument.

FORMat[:DATA]

The command specifies the format for data transmitted from the instrument to a control PC.

This command is specific to X-Series analyzers.

The query returns the current state of this setting.

Remote Command	:FORMat[:DATA] ASCii INTEger,32 REAL,32 REAL 64 :FORMat[:DATA]?
Example	FORM REAL,32 FORM ASC
Remote Command Notes	FSE FORMat[:DATA] ASCii REAL UINT [, 32] FSP, FSU, ESU FORMat[:DATA] ASCii REAL UINT [, 8 32] FSL FORMat[:DATA] ASCii REAL UINT MATLAB [,8 32] FSV FORMat[:DATA] ASCii REAL, 32

AScii

HCOPy Subsystem

The HCOPy subsystem controls the rendering of display information on output devices or to files.

Most of the HCOPy subsystem SCPI commands are accepted, but take no action and report no error. There are two exceptions: HCOPy:ABORT and HCOPy[:IMMediate].

HCOpy:ABORt

Aborts hardcopy output.

Remote Command	:HCOPy:ABORt
Example	HCOP:ABOR
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV HCOPy:ABORt

HCOpy:CMAP:DEFault

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:CMAP[1] 2 ... 26:DEFAuLt[1] 2 3
Example	HCOP:CMAP:DEF
Remote Command Notes	FSP, FSU, ESU, FSL HCOPy:CMAP[1] 2 ... 26:DEFAuLt1 2 3 FSL HCOPy:CMAP[1] 2 ... 26:DEFAuLt1 2 3 4 FSV HCOPy:CMAP[1] 2 ... 41:DEFAuLt1 2 3 4

HCO_{Py}:CMap:HSL

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPY:CMAP[1] 2 ... 26:HSL <real>,<real>,<real> :HCOPY:CMAP[1] 2 ... 26:HSL?
Example	HCOP:CMAP:HSL 0.3,0.8,1.0 HCOP:CMAP:HSL?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSP, FSU, ESU, FSL HCOPy:CMAP[1]2 ... 26:HSL <0.0 to 1.0>,<0.0 to 1.0>,<0.0 to 1.0> FSV HCOPy:CMAP[1]2 ... 41:HSL <0.0 to 1.0>,<0.0 to 1.0>,<0.0 to 1.0>
State Saved	Saved in instrument state.

HCOPy:CMAP:PDEFined

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:CMAP[1]2 ... 26:PDEFined BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLUe LGREen LCYan LRED LMAGenta :HCOPy:CMAP[1]2 ... 26:PDEFined?
Example	HCOP:CMAP:PDEF BLAC HCOP:CMAP:PDEF?
Remote Command Notes	FSP, FSU, ESU, FSL HCOPy:CMAP[1]2 ... 26:PDEFined BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLUe LGREen LCYan LRED LMAGenta FSV HCOPy:CMAP[1]2 ... 41:PDEFined BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLUe LGREen LCYan LRED LMAGenta
State Saved	Saved in instrument state.
Range	BLACK BLUE BROWn GREen CYAN RED MAGenta YELLow WHITE DGRAY LGRAY LBLUe LGREen LCYan LRED LMAGenta

HCOPy:DESTination

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:DESTination[1]2 <string> :HCOPy:DESTination[1]2?
Example	HCOP:DEST 'MMEM' HCOP:DEST?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV HCOPy:DESTination[1]2 <string>
State Saved	Saved in instrument state.

HCOPy:DEVIce:COLor

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:DEVIce:COLor ON OFF 1 0 :HCOPy:DEVIce:COLor?
Example	HCOP:DEV:COL OFF HCOP:DEV:COL?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV HCOPy:DEVIce:COLor ON OFF
Preset	OFF
State Saved	Saved in instrument state.

HCOPy:DEVIce:LANGuage

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:DEVIce:LANGuage[1] 2 GDI WMF EWMF BMP :HCOPy:DEVIce:LANGuage?
Example	HCOP:DEV:LANG GDI HCOP:DEV:LANG?
Remote Command Notes	FSE, :HCOPy:DEVIce:LANGuage[1] 2 WMF EWMF GDI BMP (FSE with NT controller) :HCOPy:DEVIce:LANGuage[1] 2 HPGL PCL4 PCL5 POSTscript ESCP WMF PCX HP7470 EPSON24 EPSON24C PCL4_C PCL4_C3 LASERJ DESKJ DESKJ_C DESKJ_C3 HPGL_LS HP7470LS FSP, FSU, ESU HCOPy:DEVIce:LANGuage[1] 2 GDI WMF EWMF BMP FSL, FSV HCOPy:DEVIce:LANGuage[1] 2 GDI WMF EWMF BMP JPG PNG
State Saved	Saved in instrument state.
Range	GDI WMF EWMF BMP

HCOPy[:IMMediate]

Initiates hard copy output. The numeric suffix specifies which printer configuration should be used for the output. If there is no suffix, configuration 1 is selected.

Remote Command	:HCOPy[:IMMediate]
Example	HCOP:IMM

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes FSE, FSP, FSU, ESU, FSL, FSV
 HCOpy[:IMMediate[1]]2]

HCOPy:ITEM:ALL

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:ITEM:ALL
Example	HCOP:ITEM:ALL
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV HCOPy:ITEM:ALL

HCOPy:ITEM:WINDow:TABLE:STATe

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:ITEM:WINDow[1] 2:TABLE:STATe ON OFF 1 0 :HCOPy:ITEM:WINDow[1] 2:TABLE:STATe?
Example	HCOP:ITEM:WIND:TABL:STAT OFF HCOP:ITEM:WIND:TABL:STAT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSV HCOPy:ITEM:WINDow[1]]2:TABLE:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

HCOPy:ITEM:WINDow:TEXT

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:ITEM:WINDow[1] 2:TEXT <string> :HCOPy:ITEM:WINDow[1] 2:TEXT?
Example	HCOP:ITEM:WIND:TEXT 'comment' HCOP:ITEM:WIND:TEXT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV HCOPy:ITEM:WINDow[1]]2:TEXT <string>
State Saved	Saved in instrument state.

HCOPy:ITEM:WINDow:TRACe:STATe

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:ITEM:WINDow[1] 2:TRACe:STATe ON OFF 1 0 :HCOPy:ITEM:WINDow[1] 2:TRACe:STATe?
Example	HCOP:ITEM:WIND:TRAC:STAT OFF HCOP:ITEM:WIND:TRAC:STAT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL HCOPy:ITEM:WINDow[1] 2:TRACe:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

HCOPy:PAGE:ORientation

This command is accepted, but takes no action and reports no error.

Remote Command	:HCOPy:PAGE:ORientation[1] 2 LANDscape PORTrait :HCOPy:PAGE:ORientation[1] 2?
Example	HCOP:PAGE:ORI LAND HCOP:PAGE:ORI?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV HCOPy:PAGE:ORientation[1] 2 LANDscape PORTrait
Preset	PORT
State Saved	Saved in instrument state.
Range	LANDscape PORTrait

INITiate Subsystem

The INITiate subsystem controls the init-measurement function.

INITiate:CONTInuous

The command switches the trigger system between the continuously-initiated mode (Continuous) or single measurement mode (Single).

The query returns the current state of this setting.

Remote Command	:INITiate[1]:CONTInuous ON OFF 1 0 :INITiate[1]:CONTInuous?
Example	:INIT:CONT 0 :INIT:CONT 1

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV INITiate[1]:CONTInuous ON OFF
Preset	ON
State Saved	Saved in instrument state.

INITiate:CONMeas

In Single sweep mode, this command resumes a stopped measurement from the current position.

Remote Command	:INITiate[1]:CONMeas
Example	INIT:CONM
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV INITiate[1]:CONMeas

INITiate[:IMMediate]

Initiates a new sweep.

Remote Command	:INITiate[1][:IMMediate]
Example	INIT
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV INITiate[1]:IMMediate

INPut Subsystem

The INPut subsystem controls the input characteristics of the instrument's RF inputs.

INPut:ATTenuation

The command specifies the input attenuator setting.

With the Electronic Attenuator Option, this mode supports 2 dB steps.

The query returns the current value of this setting.

Remote Command	:INPut[1]:ATTenuation <rel_amp1> :INPut[1]:ATTenuation?
Example	INP:ATT 40dB

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE INPut[1]:ATTenuation 0 to 70 dB FSP, FSU, ESU INPut[1]:ATTenuation 0 to 70/75 dB FSL, FSV INPut[1]:ATTenuation <numeric_value> in dB
Preset	FSE NA FSP, FSU, ESU, FSV 10dB FSL 0dB
State Saved	Saved in instrument state.
Min	0
Max	70

INPut:ATTenuation:AUTO

The command switches between coupling of the input attenuation to the reference level (state ON), and manual input attenuation (state OFF).

The query returns the current state of this setting.

Remote Command	:INPut[1]:ATTenuation:AUTO ON OFF 1 0 :INPut[1]:ATTenuation:AUTO?
Example	INP:ATT:AUTO ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV INPut[1]:ATTenuation:AUTO ON OFF
Preset	ON
State Saved	Saved in instrument state.

INPut:EATT

The command specifies the setting of the electronic input attenuator.

This mode supports a maximum value of 24 dB.

The query returns the current value of this setting.

Remote Command	:INPut[1]:EATT <rel_amp1> :INPut[1]:EATT?
----------------	--

Compatible SCPI Commands
Supported SCPI Commands

Example	INP:EATT 15dB
Remote Command Notes	FSP, FSU, ESU INPut[1]2:EATT 0 to 30dB FSV INPut[1]2:EATT 0 to 25dB
Preset	0
State Saved	Saved in instrument state.
Min	0
Max	24

INPut:EATT:AUTO

The command switches between coupling of the electronic input attenuation to the reference level (state ON), and manual input attenuation (state OFF).

The query returns the current state of this setting.

Remote Command	:INPut[1]:EATT:AUTO ON OFF 1 0 :INPut[1]:EATT:AUTO?
Example	INP:EATT:AUTO ON
Remote Command Notes	FSP, FSU, ESU, FSV INPut[1]2:EATT:AUTO ON OFF
Preset	ON
State Saved	Saved in instrument state.

INPut:EATT:STATe

The command switches electronic input attenuation on or off.

The query returns the current state of this setting.

Remote Command	:INPut[1]:EATT:STATe ON OFF 1 0 :INPut[1]:EATT:STATe?
Example	INP:EATT:STAT ON
Remote Command Notes	FSP, FSU, ESU, FSV INPut[1]2:EATT:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

INPut:IMPedance

The command sets the instrument's nominal input impedance.

The query returns the current state of this setting.

Remote Command	:INPut[1]:IMPedance 50 75 :INPut[1]:IMPedance?
Example	INP:IMP 75 INP:IMP?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV INPut[1]:IMPedance 50 75
Preset	50
State Saved	Saved in instrument state.
Range	50 75

INPut:GAIN:STATe

The command switches the instrument's preamplifier on or off.

The query returns the current state of this setting.

Remote Command	:INPut[1]:GAIN:STATe ON OFF 1 0 :INPut[1]:GAIN:STATe?
Example	INP:GAIN:STAT ON
Remote Command Notes	FSP, FSU, ESU, FSL, FSV INPut[1]:GAIN:STATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

INPut:MIXer[:POWer]

This command defines the desired power at the input mixer of the R&S FSU/ESU. On any change to the reference level, the RF attenuation will be adjusted in a way that makes the difference between reference level and RF attenuation come as close to the desired mixer level as possible.

Currently, this command won't invoke any action.

Remote Command	:INPut[1]:MIXer[:POWer] <real> :INPut[1]:MIXer[:POWer]?
Example	INP:MIX -30 INP:MIX?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSU, ESU INPut[1]2:MIXer[:POWer] <numeric value>
Preset	-25 dBm
Min	-100 dBm
Max	5 dBm

INPut:MIXer:AUTO

This command enables/disables the automatic setup of the mixer level.
Currently, this command won't invoke any action.

Remote Command	:INPut[1]:MIXer:AUTO ON OFF 1 0 :INPut[1]:MIXer:AUTO?
Example	INP:MIX:AUTO ON INP:MIX:AUTO?
Remote Command Notes	FSU, ESU INPut[1]2:MIXer:AUTO ON OFF
Preset	ON
State Saved	Saved in instrument state.

INSTrument Subsystem

The INSTrument subsystem allows you to select the analyzer's operating mode.

INSTrument[:SElect]

The command selects the analyzer's mode according to the value of a text parameter.

This mode supports a parameter set that differs from that listed above. For details, see the table of available parameter values in the section ["INSTrument:NSElect" on page 133](#).

The query returns the current state of this setting.

Remote Command	:INSTrument[:SElect] <string> :INSTrument[:SElect]?
Example	:INST:SEL SA
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV INSTrument[1]2[:SElect] SANalyzer ...
State Saved	Saved in instrument state.

INSTRument:NSElect

The command selects the analyzer's mode according to the value of a numeric parameter.

This mode supports the parameter values listed in the table below.

Mode Identification Numbers and Strings for X-Series Analyzers:

Mode	:INSTRument:NSElect <integer>	:INSTRument[:SElect] <parameter>
Spectrum Analyzer	1	SA
GSM	3	GSM
cdmaOne	4	CDMA
NADC	5	NADC
PDC	6	PDC
I/Q Analyzer (Basic)	8	BASIC
WCDMA with HSDPA/HSUPA	9	WCDMA
cdma2000	10	CDMA2K
GSM/EDGE/EDGE Evo	13	EDGE GSM
Phase Noise	14	PNOISE
1xEV-DO	15	CDMA1XEV
Combined WLAN	19	CWLAN
802.16 OFDMA (WiMAX/WiBro)	75	WIMAXOFDMA
Combined Fixed WiMAX	81	CWIMAXOFDM
Vector Signal Analyzer (VXA)	100	VSA
89601 VSA	101	VSA89601
LTE	102	LTE
iDEN/WiDEN/MotoTalk	103	IDEN
802.16 OFDM (Fixed WiMAX)	104	WIMAXFIXED
LTE TDD	105	LTETDD
TD-SCDMA with HSPA/8PSK	211	TDSCDMA
Noise Figure	219	NFIGURE
Bluetooth	228	BLUETOOTH
Measuring Receiver	233	MRECEIVE
Analog Demod	234	ADEMODO

Compatible SCPI Commands
Supported SCPI Commands

Mode	:INSTrument:NSElect <integer>	:INSTrument[:SElect] <parameter>
DVB-T/H	235	DVB
DTMB	236	DTMB
ISDB-T	239	ISDBT
CMMB	240	CMMB
Remote Language Compatibility	266	RLC
SCPI Language Compatibility	270	SCPILC

The query returns the current value of this setting.

Remote Command	:INSTrument:NSElect <integer> :INSTrument:NSElect?
Example	:INST:NSEL 1
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV INSTrument:NSElect <numeric value>
State Saved	Saved in instrument state.

MMEMory Subsystem

The MMEMory (mass memory) subsystem allows access to the analyzer's storage media, and permits storage of various settings.

MMEMory:CATalog?

Reads the content of the specified directory.

Remote Command	:MMEMory:CATalog <string> :MMEMory:CATalog?
Example	:MMEM:CAT 'C.' :MMEM:CAT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:CATalog? <path>
State Saved	Saved in instrument state.

MMEMory:CDIRectory

The command changes the current directory to that specified by <directory_name>.

The query returns the current directory setting.

Remote Command	:MMEMory:CDIRectory <string> :MMEMory:CDIRectory?
Example	:MMEM:CDIR 'C:\Temp' :MMEM:CDIR?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:CDIRectory <directory_name>
State Saved	Saved in instrument state.

MMEMory:COPY

If <file_source> specifies a single file, copies the file to <file_destination>.

If <file_source> lists more than one file, copies the files to the destination directory specified by <file_destination>.

Remote Command	:MMEMory:COPY <string>,<string>
Example	:MMEM:COPY 'C:\test.txt' 'D:'
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:COPY <file_source>,<file_destination>

MMEMory:DATA

The command writes the data block <block_data> from the control computer into the file specified by (in the analyzer).

The query transfers the file specified by from the analyzer to the control computer.

Remote Command	:MMEMory:DATA <string>[,<block_data>] :MMEMory:DATA? <string>
Example	:MMEM:DATA 'TEST.CFG',#217This is the file :MMEM:DATA? 'TEST.CFG'
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:DATA <file_name>[,<block data>]
State Saved	Saved in instrument state.

MMEMory:DELeTe

Deletes the file specified by .

Remote Command	:MMEMory:DELeTe <string >
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Example	:MMEM:DEL 'C:\test.txt'
Remote Command Notes	FSE, FSP, FSU, ESU, FSL MMEMory:DELeTe <file_name>

MMEMory:INITialize

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:INITialize <string >
Example	:MMEM:INIT 'A:'
Remote Command Notes	FSE, FSP, FSU, ESU MMEMory:INITialize 'A:'

MMEMory:LOAD:STATe

Loads device settings from the file specified by . The file contents are set as the new analyzer state.

Remote Command	:MMEMory:LOAD:STATe 1,<string>
Example	:MMEM:LOAD:STAT 1,'myState.state'
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:LOAD:STATe 1,<file_name>

MMEMory:LOAD:AUTO

Specifies a settings file, the contents of which will automatically be loaded (and set as the analyzer state) when the analyzer is switched on.

Remote Command	:MMEMory:LOAD:AUTO 1,<string>
Example	:MMEM:LOAD:AUTO 1,'myState.state'
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:LOAD:AUTO 1,<file_name>

MMEMory:MDIRectory

Creates the new directory specified by <directory_name>.

Remote Command	:MMEMory:MDIRectory <string >
Example	:MMEM:MDIR 'C:\T1'
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:MDIRectory <directory_name>

MMEMory:MOVE

If <file_destination> contains no path information, then <file_source> is renamed to <file_destination>.

If <file_destination> contains path information, <file_source> is moved to the specified path, and renamed if <file_destination> also includes a file name.

Remote Command	:MMEMory:MOVE <string>,<string>
Example	:MMEM:MOVE 'C:\test.txt' 'D:'
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:MOVE <file_source>,<file_destination>

MMEMory:MSIS

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:MSIS <string > :MMEMory:MSIS?
Example	:MMEM:MSIS 'A:'
Remote Command Notes	FSE, FSL, FSP, FSU, ESU, FSV MMEMory:MSIS 'A:' ... 'Z:'

MMEMory:NAME

The command specifies the path and name of the destination file, for use when a print-to-file operation is initiated using the command HCOPY:IMMediate.

The specified destination file type must be PNG.

The query returns the current value of this setting.

Remote Command	:MMEMory:NAME <string > :MMEMory:NAME?
Example	:MMEM:NAME '1.PNG' :MMEM:NAME?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:NAME <file_name>

MMEMory:RDIRECTory

Deletes the directory specified by <directory_name>.

Remote Command	:MMEMory:RDIRECTory <string>
Example	:MMEM:RDIR 'C:\Test'

Remote Command Notes FSE, FSP, FSU, ESU, FSL, FSV
MMEMory:RDIRECTory <directory_name>

MMEMory:STORe:STATe

Stores the current analyzer state settings in a set of files. The files use the specified file name, but have differing extensions.

Remote Command	:MMEMory:STORe:STATe 1,<string>
Example	:MMEM:STORe:STAT 1,'myState.state'
Remote Command Notes	FSE MMEMory:STORe:STATe 1,<file_name> FSP, FSU, ESU, FSL, FSV MMEMory:STORe[1]2:STATe 1,<file_name>

MMEMory:STORe:TRACe

Stores the specified trace (1...6) in an ASCII-format file specified by .

Remote Command	:MMEMory:STORe:TRACe TRACE1 TRACE2 TRACE3 TRACE4 TRACE5 TRACE6 ALL,<string>
Example	:MMEM:STORe:TRACe TRACe1,'Trace1.trace'
Remote Command Notes	FSE, MMEMory:STORe:TRACe 1 2 3 4,<file_name> FSP, FSU, ESU MMEMory:STORe[1]2:TRACe 1 2 3,<file_name> FSL, FSV MMEMory:STORe[1]2:TRACe 1 2 3 4 5 6,<file_name>

MMEMory:CLEAr:STATe

Clears the analyzer setting specified by .

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:CLEAr:STATe 1,<string>
Example	:MMEM:CLE:STAT 1,'Trace1.trace'
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:CLEAr:STATe 1,<file_name>

MMEMory:CLEAr:ALL

Clears all analyzer settings in the current directory.

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:CLEar:ALL
Example	:MMEM:CLE:ALL
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:CLEar:ALL

MMEMory:SElect[:ITEM]:HWSettings

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:SElect[:ITEM]:HWSettings ON OFF 1 0 :MMEMory:SElect[:ITEM]:HWSettings?
Example	MMEM:SEL:HWS OFF MMEM:SEL:HWS?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:SElect[:ITEM]:HWSettings ON OFF
Preset	ON
State Saved	Saved in instrument state.

MMEMory:SElect[:ITEM]:TRACe[:ACTive]

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:SElect[:ITEM]:TRACe[:ACTive] ON OFF 1 0 :MMEMory:SElect[:ITEM]:TRACe[:ACTive]?
Example	MMEM:SEL:TRAC OFF MMEM:SEL:TRAC?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL MMEMory:SElect[:ITEM]:TRACe[1] 2 ... 4 ON OFF FSV MMEMory:SElect[:ITEM]:TRACe[1] 2 ... 6 ON OFF
Preset	OFF
State Saved	Saved in instrument state.

MMEMory:SElect[:ITEM]:LINes:ALL

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:SElect[:ITEM]:LINes:ALL ON OFF 1 0 :MMEMory:SElect[:ITEM]:LINes:ALL?
Example	MMEM:SEL:LIN:ALL OFF MMEM:SEL:LIN:ALL?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:SElect[:ITEM]:LINes:ALL ON OFF
Preset	FSE, FSP, FSU, ESU, FSL ON FSV OFF
State Saved	Saved in instrument state.

MMEMory:SElect[:ITEM]:SCData

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:SElect[:ITEM]:SCData ON OFF 1 0 :MMEMory:SElect[:ITEM]:SCData?
Example	MMEM:SEL:SCD OFF MMEM:SEL:SCD?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL MMEMory:SElect[:ITEM]:SCData ON OFF
Preset	OFF
State Saved	Saved in instrument state.

MMEMory:SElect[:ITEM]:TRANsdruce:ALL

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:SElect[:ITEM]:TRANsdruce:ALL ON OFF 1 0 :MMEMory:SElect[:ITEM]:TRANsdruce:ALL?
Example	MMEM:SEL:TRAN:ALL OFF MMEM:SEL:TRAN:ALL?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:SElect[:ITEM]:TRANsdruce:ALL ON OFF

Compatible SCPI Commands

Supported SCPI Commands

Preset	FSE, FSP, FSU, ESU, FSL ON FSV OFF
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State Saved	Saved in instrument state.
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MMEMory:SElect[:ITEM]:ALL

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:SElect[:ITEM]:ALL
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Example	MMEM:SEL:ALL
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Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:SElect[:ITEM]:ALL
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MMEMory:SElect[:ITEM]:NONE

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:SElect[:ITEM]:NONE
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Example	MMEM:SEL:NONE
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Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:SElect[:ITEM]:NONE
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MMEMory:SElect[:ITEM]:DEFault

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:SElect[:ITEM]:DEFault
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Example	MMEM:SEL:DEF
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Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:SElect[:ITEM]:DEFault
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MMEMory:COMMeNt

Specifies a comment (max. 60 characters), to be associated with a stored analyzer setting.

This command is accepted, but takes no action and reports no error.

Remote Command	:MMEMory:COMMeNt <string> :MMEMory:COMMeNt?
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Compatible SCPI Commands
Supported SCPI Commands

Example	MMEM:COMM 'Unknown Trace' MMEM:COMM?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV MMEMory:COMMeNt <string>
State Saved	Saved in instrument state.

SENSe:AVERage Subsystem

The SENSe:AVERage subsystem calculates the acquired data average. After several successive measurements, a new test result is obtained.

[SENSe]:AVERage:COUNT

Specifies the number of measurements that contribute to the average value.

In the SCPI LC mode, the maximum value is 10000 and not 32767 as in the emulated instruments.

Remote Command	[:SENSe] :AVERage :COUNT <integer> [:SENSe] :AVERage :COUNT?
Example	SENS:AVER:COUN 10 SENS:AVER:COUN?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL [SENSe[1]]2]:AVERage:COUNT 0 to 32767
Preset	0
State Saved	Saved in instrument state.
Min	0
Max	10000
Backward Compatibility	:SENSe1:AVERage:COUNT

[SENSe]:AVERage[:STATe]

Switches on or off the selected trace's average calculation (STATe) within the measurement window.

Remote Command	[:SENSe] :AVERage :STATe[1] 2 ... 6 ON OFF 1 0 [:SENSe] :AVERage :STATe[1] 2 ... 6?
Example	AVER:STAT1 OFF SENS:AVER:STAT3 ON

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE :[SENSe[1]]2]:AVERage[:STATe] ON OFF FSP, FSU, ESU [SENSe[1]]2]:AVERage[:STATe[1]]2]3] ON OFF FSL, FSV [SENSe[1]]2]:AVERage[:STATe[1]]2]...[6] ON OFF
Preset	OFF
State Saved	Yes.
Backwards Compatibility SCPI	:SENSe1:AVERage[:STATe]

[SENSe]:AVERage:TYPE

Specifies the average function type.

Remote Command	[:SENSe] :AVERage : TYPE VIDEo LINear [:SENSe] :AVERage?
Example	AVER:TYPE LIN AVER:TYPE?
Remote Command Notes	FSE :[SENSe[1]]2]:AVERage:TYPE MAXimum MINimum SCALar FSP, FSU, ESU, FSL [SENSe[1]]2]:AVERage:TYPE VIDEo LINear FSV [SENSe[1]]2]:AVERage:TYPE VIDEo LINear POWer
Preset	VIDeo
Range	VIDeo LINear
Backwards Compatibility SCPI	:SENSe1:AVERage:TYPE

SENSe:BANDwidth Subsystem

The SENSe:BANDwidth subsystem specifies the instrument's filter bandwidths. Both BANDwidth and BWIDth perform the same functions.

[SENSe]:BANDwidth|BWIDth[:RESolution]

Specifies the instrument's resolution bandwidth.

Compatible SCPI Commands
Supported SCPI Commands

In the SCPI LC mode, the maximum resolution bandwidth is 8 MHz (not 10 MHz as in the emulated instruments) and the minimum resolution bandwidth is 1 Hz (not 10 Hz as in the emulated instruments).

Remote Command	[:SENSe]:BANDwidth BWIDth[:RESolution] <freq> [:SENSe]:BANDwidth BWIDth[:RESolution]?
Example	BAND 1 KHZ BAND?
Remote Command Notes	The setting and querying of values depends on the current bandwidth type. FSE, FSL [SENSe[1] 2]:BANDwidth BWIDth[:RESolution] <numeric_value> FSP [SENSe[1] 2]:BANDwidth BWIDth[:RESolution] 10Hz to 10MHz FSU, ESU [SENSe[1] 2]:BANDwidth BWIDth[:RESolution] 10 Hz to 20MHz FSV [SENSe[1] 2]:BANDwidth BWIDth[:RESolution] 10 Hz to 40MHz
Preset	3 MHz
State Saved	Saved in instrument state.
Min	1 Hz
Max	8 MHz
Backwards Compatibility SCPI	:SENSe1:BANDwidth BWIDth[:RESolution]

[SENSe]:BANDwidth|BWIDth[:RESolution]:AUTO

Automatically couples the instrument's resolution bandwidth to the span or it cancels the coupling.

Remote Command	[:SENSe]:BANDwidth BWIDth[:RESolution]:AUTO OFF ON 0 1 [:SENSe]:BANDwidth BWIDth[:RESolution]:AUTO?
Example	BWID:AUTO ON BWID:AUTO?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1] 2]:BANDwidth BWIDth[:RESolution]:AUTO ON OFF
Preset	ON
Backwards Compatibility SCPI	:SENSe1:BANDwidth BWIDth[:RESolution]:AUTO

[SENSe]:BANDwidth|BWIDth[:RESolution]:RATio

Specifies the resolution bandwidth (Hz) / span (Hz) ratio.

Remote Command	[:SENSe]:BANDwidth BWIDth[:RESolution]:RATio <real> [:SENSe]:BANDwidth BWIDth[:RESolution]:RATio?
Example	BAND:RAT 0.1
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:BANDwidth BWIDth[:RESolution]:RATio 0.0001 to 1
Preset	FSE FSP, FSE, FSU, FSL FSV NA 0.02 with BAND:TYPE NORMAl or RBW > 30 kHz 0.01 with BAND:TYPE FFT for RBW ≤ 30 kHz 0.01 FSP, FSE, FSU, FSL FSV NA 0.02 with BAND:TYPE NORMAl or RBW > 30 kHz 0.01 with BAND:TYPE FFT for RBW ≤ 30 kHz 0.01
State Saved	Saved in instrument state.
Min	0.0001
Max	1
Backwards Compatibility SCPI	:SENSe1:BANDwidth BWIDth[:RESolution]:RATio

[SENSe]:BANDwidth|BWIDth[:RESolution]:TYPE

Sets the resolution bandwidth filter type to "normal" analog, FIR in 1, 3, 10 steps, or FFT for bandwidths less than 100 kHz.

CFILter and RRC are not supported in the current version.

Remote Command	[:SENSe]:BANDwidth BWIDth[:RESolution]:TYPE NORMAl FFT CFILter RRC PULSe NOISe [:SENSe]:BANDwidth BWIDth[:RESolution]:TYPE?
Example	BAND:TYPE RRC BAND:TYPE?

Compatible SCPI Commands
Supported SCPI Commands

Remote Command Notes	FSP [SENSe[1] 2]:BANDwidth BWIDth[:RESolution]:TYPE NORMal FFT CFILter RRC FSU, ESU, FSL [SENSe[1] 2]:BANDwidth BWIDth[:RESolution]:TYPE NORMal FFT CFILter RRC PULSe PULSe FSV [SENSe[1] 2]:BANDwidth BWIDth[:RESolution]:TYPE NORMal CFILter RRC P5
Preset	NORMal
State Saved	Saved in instrument state.
Range	NORMal FFT CFILter RRC PULSe NOISe
Backwards Compatibility SCPI	:SENSe1:BANDwidth BWIDth[:RESolution]:TYPE

[SENSe]:BANDwidth|BWIDth:VIDeo

Sets the instrument's video bandwidth to between 10 Hz and 10 MHz in 1, 3, 10 steps.

In the SCPI LC mode, the maximum video bandwidth is 50 MHz and not 10 MHz as in FSx.

Remote Command	[:SENSe] :BANDwidth BWIDth:VIDeo <freq> [:SENSe] :BANDwidth BWIDth:VIDeo?
Example	BAND:VID 1KHZ BAND:VID?
Remote Command Notes	FSE, FSP, FSU, ESU [SENSe[1] 2]:BANDwidth BWIDth:VIDeo 1Hz to 10MHz FSL, FSV [SENSe[1] 2]:BANDwidth BWIDth:VIDeo <numeric_value>
Preset	10 MHz
State Saved	Saved in instrument state.
Min	1 Hz
Max	50 MHz
Backwards Compatibility SCPI	:SENSe1:BANDwidth BWIDth[:RESolution]:VIDeo

[SENSe]:BANDwidth|BWIDth:VIDeo:AUTO

Automatically couples the instrument's video bandwidth to its resolution bandwidth or cancels the coupling.

Remote Command	[:SENSe] :BANDwidth BWIDth:VIDeo:AUTO ON OFF 1 0[:SENSe] :BANDwidth BWIDth:VIDeo:AUTO?
Example	BAND:VID:AUTO OFF
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1] 2]:BANDwidth BWIDth:VIDeo:AUTO ON OFF
Preset	ON
State Saved	Saved in instrument state.
Backwards Compatibility SCPI	:SENSe1:BANDwidth BWIDth[:RESolution]:VIDeo:AUTO

[SENSe]:BANDwidth|BWIDth:VIDeo:RATio

Specifies the video bandwidth (Hz) / resolution bandwidth (Hz) ratio.

Remote Command	[:SENSe] :BANDwidth BWIDth:VIDeo:RATio <real> [:SENSe] :BANDwidth BWIDth:VIDeo:RATio?
Example	BAND:VID:RAT 2 BAND:VID:RAT?
Remote Command Notes	FSE [SENSe[1] 2]:BANDwidth BWIDth:VIDeo:RATIO 0.001 to 1000 SINE PULSe NOISe FSP, FSU, ESU, FSL, FSV [SENSe[1] 2]:BANDwidth BWIDth:VIDeo:RATio 0.01 to 1000
Preset	3
State Saved	Saved in instrument state.
Min	0.00001
Max	3000000
Backwards Compatibility SCPI	:SENSe1:BANDwidth BWIDth[:RESolution]:VIDeo:RATio

SENSe:CORRection Subsystem

[SENSe]:CORRection:EGAIN:INPut[:MAGNitude]

Informs the analyzer of an external gain.

SCPI LC mode supports the range of -120 to 120 dB, not -200 to 200 dB as FSP.

Remote Command	[:SENSe]:CORRection:EGAI:n:INPut[:MAGNI:tude] <rel_amp1> [:SENSe]:CORRection:EGAI:n:INPut[:MAGNI:tude]?
Example	CORR:EGA:INP 10DB
Remote Command Notes	FSP, FSV [SENSe[1]]2]:CORRection:EGAI:n:INPut[:MAGNI:tude] -200...200dB
Preset	0 dB
State Saved	Saved in instrument state.
Min	-120 dB
Max	120 dB
Backwards Compatibility SCPI	:SENSe1:CORRection:EGAI:n:INPut[:MAGNI:tude]

[SENSe]:CORRection:TRANsdUcer:SElect

This command selects the transducer factor designated by <name>. If <name> does not exist yet, a new transducer factor is created.

This command must be sent prior to the subsequent commands for modifying/activating transducer factors.

Parameter: <name> ::= Name of the transducer factor in string data form with a maximum of 8 characters.

Currently, this command supports 6 correction settings.

Remote Command	[:SENSe]:CORRection:TRANsdUcer:SElect <string> [:SENSe]:CORRection:TRANsdUcer:SElect?
Example	CORR:TRAN:SEL "A" CORR:TRAN:SEL?
Notes	Altogether there are only 6 different transducers can be selected. If there is a new transducer, the most old one will be replaced by the new one.
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:CORRection:TRANsdUcer:SElect <name>
State Saved	Saved in instrument state.

[SENSe]:CORRection:TRANsdUcer:UNIT

This command defines the unit of the transducer factor selected.

Prior to this command, the command SENS:CORR:TRAN:SEL must be sent.

Compatible SCPI Commands

Supported SCPI Commands

Parameter: <string>::= 'DB' | 'DBM' | 'DBMV' | 'DBUV' | 'DBUV/M' | 'DBUA' | 'DBUA/M' | 'DBPW' | 'DBPT'

Currently, this command supports 6 correction settings.

This command won't invoke any action and the default value in the system is always "DB".

Remote Command	[:SENSe]:CORRection:TRANsducer:UNIT <string> [:SENSe]:CORRection:TRANsducer:UNIT?
Example	CORR:TRAN:UNIT "DB" CORR:TRAN:UNIT?
Notes	This command won't invoke any action and the default value in the system is always be "DB".
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:CORRection:TRANsducer:UNIT 'DB' 'DBM' 'DBMV' 'DBUV' 'DBUV/M' 'DBUA' 'DBUA/M' 'DBPW' 'DBPT'
State Saved	Saved in instrument state.

[SENSe]:CORRection:TRANsducer:SCALing

This command defines whether the frequency scaling of the transducer factor is linear or logarithmic.

Prior to this command, the command SENS:CORR:TRAN:SEL must be sent.

Currently, this command supports 6 correction settings.

Remote Command	[:SENSe]:CORRection:TRANsducer:SCALing LINear LOGarithmic [:SENSe]:CORRection:TRANsducer:SCALing?
Example	CORR:TRAN:SCAL LIN CORR:TRAN:SCAL?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:CORRection:TRANsducer:SCALing LINear LOGarithmic
State Saved	Saved in instrument state.
[DDefault	LINear

[SENSe]:CORRection:TRANsducer:COMMeNt

This command defines the comment for the selected transducer factor.

Prior to this command, the command SENS:CORR:TRAN:SEL must be sent.

Currently, this command supports 6 correction settings.

Remote Command	[:SENSe]:CORRection:TRANsdUcer:COMMeNt <string> [:SENSe]:CORRection:TRANsdUcer:COMMeNt?
Example	CORR:TRAN:COMM "NA" CORR:TRAN:COMM?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1] 2]:CORRection:TRANsdUcer:COMMeNt <string>
State Saved	Saved in instrument state.
Default	""

[SENSe]:CORRection:TRANsdUcer:DATA

This command defines the reference values of the transducer factor selected. These values are

entered as a sequence of frequency/level pairs. The frequencies must be sent in ascending order.

Prior to this command, the command SENS:CORR:TRAN:SEL must be sent. The level values are sent as dimensionless numbers; the unit is specified by means of the command

SENS:CORR:TRAN:UNIT.

Currently, this command supports 6 correction settings.

All parameters have no unit, which is different from the R&S instruments.

Remote Command	[:SENSe]:CORRection:TRANsdUcer:DATA <freq_real>,<level_real>,... [:SENSe]:CORRection:TRANsdUcer:DATA?
Example	CORR:TRAN:DATA 1,2,3,4,5,6,7,8,9,0 CORR:TRAN:DATA?
Notes	All parameters have no unit, which is different from the R&S box.
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1] 2]:CORRection:TRANsdUcer:DATA <freq>,<level>..
State Saved	Saved in instrument state.

[SENSe]:CORRection:TRANsdUcer[:STATe]

This command switches the selected transducer factor on or off.

Prior to this command, the command SENS:CORR:TRAN:SEL must be sent.

Currently, this command supports 6 correction settings.

Remote Command	[:SENSe]:CORRection:TRANsdUcer:STATe ON OFF 1 0 [:SENSe]:CORRection:TRANsdUcer:STATe?
Example	CORR:TRAN:STAT OFF CORR:TRAN:STAT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:CORRection:TRANsdUcer[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

[SENSe]:CORRection:TRANsdUcer:DELeTe

This command deletes the selected transducer factor.

Prior to this command, the command SENS:CORR:TRAN:SEL must be sent.

Currently, this command supports 6 correction settings.

Remote Command	[:SENSe]:CORRection:TRANsdUcer:DELeTe
Example	CORR:TRAN:DEL
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:CORRection:TRANsdUcer:DELeTe
State Saved	Saved in instrument state.

[SENSe]:CORRection:TRANsdUcer:VIEW

This command switches on the display of the active transducer factor or set.

Prior to this command, the command SENS:CORR:TRAN:SEL must be sent.

Currently, this command supports 6 correction settings.

Remote Command	[:SENSe]:CORRection:TRANsdUcer:VIEW ON OFF 1 0 [:SENSe]:CORRection:TRANsdUcer:VIEW?
Example	CORR:TRAN:VIEW OFF CORR:TRAN:VIEW?
Remote Command Notes	FSP, FSL, FSV [SENSe[1]]2]:CORRection:TRANsdUcer:VIEW ON OFF
Preset	OFF
State Saved	Saved in instrument state.

SENSe:DETECTOR Subsystem

The SENSe:DETECTOR subsystem controls measurement data acquisition via selection of the detector for the corresponding trace.

[SENSe]:DETECTOR[:FUNCTION]

Switches on the data acquisition detector in the selected trace.

Remote Command	<code>[:SENSe]:DETECTOR[1] 2 3[:FUNCTION] APEak NEGative POSitive SAMPlE RMS AVERage QPEak</code> <code>[:SENSe]:DETECTOR[1] 2 3[:FUNCTION]?</code>
Example	DET POS
Remote Command Notes	FSE <code>[SENSe[1]]2]:DETECTOR[1] 2 ...4[:FUNCTION] APEak NEGative POSitive SAMPlE RMS AVERage</code> FSP, FSL <code>[SENSe[1]]2]:DETECTOR[1] 2 3[:FUNCTION] APEak NEGative POSitive SAMPlE RMS AVERage QPEak</code> FSU, ESU <code>[SENSe[1]]2]:DETECTOR[1] 2 3[:FUNCTION] APEak NEGative POSitive SAMPlE RMS AVERage QPEak CAverage CRMS</code> FSL <code>[SENSe[1]]2]:DETECTOR[1] 2 ...6[:FUNCTION] APEak NEGative POSitive SAMPlE RMS AVERage QPEak</code> FSV <code>[SENSe[1]]2]:WINDow]:DETECTOR[1] 2 ...6[:FUNCTION] APEak NEGative POSitive SAMPlE RMS AVERage QPEak</code>
Preset	APEak
State Saved	Saved in instrument state.
Range	APEak NEGative POSitive SAMPlE RMS AVERage QPEak
Backwards Compatibility SCPI	:SENSe1:DETECTOR[1] 2 3[:FUNCTION]

[SENSe]:DETECTOR[:FUNCTION]:AUTO

Either couples the detector to the current trace setting or turns coupling off.

Remote Command	<code>[:SENSe]:DETECTOR[1] 2 3[:FUNCTION]:AUTO ON OFF 1 0</code> <code>[:SENSe]:DETECTOR[1] 2 3[:FUNCTION]:AUTO?</code>
Example	DET:AUTO OFF

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE [SENSe[1]]2]:DETEctor[1]]2]...[4[:FUNCTION]:AUTO ON OFF FSP, FSU, ESU [SENSe[1]]2]:DETEctor[1]]2]3[:FUNCTION]:AUTO ON OFF FSL [SENSe[1]]2]:DETEctor[1]]2]...[6[:FUNCTION]:AUTO ON OFF FSV [SENSe[1]]2][:WINDow]:DETEctor[1]]2]...[6[:FUNCTION]:AUTO ON OFF
Preset	ON
State Saved	Saved in instrument state.
Backwards Compatibility SCPI	:SENSe1:DETEctor[1]]2]3[:FUNCTION]:AUTO

SENSe:FREQuency Subsystem

The SENSe:FREQuency subsystem specifies the active display's frequency axis. The frequency axis can either be set via the center frequency and span, or via the start and stop frequency.

[SENSe]:FREQuency:CENTer

Specifies the analyzer's center frequency or the measuring frequency for span = 0.

Remote Command	[:SENSe] :FREQuency:CENTer <freq> [:SENSe] :FREQuency:CENTer?
Example	FREQ:CENT 50MHz FREQ:CENT?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:FREQuency:CENTer 0 GHz to fmax
Preset	fmax / 2 with fmax = maximum frequency
State Saved	Saved in instrument state.
Min	Depends on instrument minimum frequency
Max	Depends on instrument maximum frequency
Backwards Compatibility SCPI	:SENSe1:FREQuency:CENTer

[SENSe]:FREQuency:CENTer:STEP

Specifies the center frequency's step width.

Remote Command	[:SENSe] :FREQuency:CENTer:STEP <freq> [:SENSe] :FREQuency:CENTer:STEP?
Example	FREQ:CENT:STEP 120MHz
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:FREQuency:CENTer:STEP 0 to fmax
Preset	1MHz
State Saved	Saved in instrument state.
Min	1 Hz
Max	27.0 GHz
Backwards Compatibility SCPI	:SENSe1:FREQuency:CENTer:STEP

[SENSe]:FREQuency:CENTer:STEP:LINK

Couples the center frequency's step width to the span (span >0) or to the resolution bandwidth (span = 0), or cancels the coupling.

Remote Command	[:SENSe] :FREQuency:CENTer:STEP:LINK SPAN RBW OFF [:SENSe] :FREQuency:CENTer:STEP:LINK?
Example	FREQ:CENT:STEP:LINK RBW FREQ:CENT:STEP:LINK?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:FREQuency:CENTer:STEP:LINK SPAN RBW OFF
Preset	SPAN
State Saved	Saved in instrument state.
Backwards Compatibility SCPI	:SENSe1:FREQuency:CENTer:STEP:LINK

[SENSe]:FREQuency:CENTer:STEP:LINK:FACTOR

Couples the center frequency's step width to a factor of the span (span >0) or to the resolution bandwidth (span = 0).

Remote Command	[:SENSe] :FREQuency:CENTer:STEP:LINK:FACTOR <int> [:SENSe] :FREQuency:CENTer:STEP:LINK:FACTOR?
Example	FREQ:CENT:STEP:LINK:FACTOR 20PCT

Compatible SCPI Commands
Supported SCPI Commands

Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:FREQuency:CENTer:STEP:LINK:FACTor 1 to 100 PCT
State Saved	Saved in instrument state.
Min	1
Max	100
Backwards Compatibility SCPI	:SENSe1:FREQuency:CENTer:STEP:LINK:FACTor

[SENSe]:FREQuency:SPAN

Specifies the frequency span.

Remote Command	[:SENSe] :FREQuency:SPAN <freq> [:SENSe] :FREQuency:SPAN?
Example	FREQ:SPAN 10MHz
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:FREQuency:SPAN 0Hz to fmax
Preset	3 GHz
State Saved	Saved in instrument state.
Max	26.5 GHz
Backwards Compatibility SCPI	:SENSe1:FREQuency:SPAN

[SENSe]:FREQuency:SPAN:FULL

Sets the frequency span to maximum.

Remote Command	[:SENSe] :FREQuency:SPAN:FULL
Example	FREQ:SPAN:FULL
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:FREQuency:SPAN:FULL
Backwards Compatibility SCPI	:SENSe1:FREQuency:SPAN:FULL

[SENSe]:FREQuency:START

Specifies the analyzer's start frequency. This command is available only in the frequency domain (span > 0).

Remote Command	[:SENSe] :FREQuency:START <freq> [:SENSe] :FREQuency:START?
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Compatible SCPI Commands
Supported SCPI Commands

Example	FREQ:STAR 200MHz FREQ:STAR?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:FREQuency:STARt 0Hz to fmax
Preset	0 Hz
State Saved	Saved in instrument state.
Min	0Hz
Max	Depends on the instrument maximum frequency

[SENSe]:FREQuency:STOP

Specifies the analyzer's stop frequency. This command is available only in the frequency domain (span > 0).

Remote Command	[:SENSe] :FREQuency:STOP <freq> [:SENSe] :FREQuency:STOP?
Example	FREQ:STOP 220MHz FREQ:STOP?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:FREQuency:STOP 0Hz to fmax
Preset	3GHZ
State Saved	Saved in instrument state.
Min	0Hz
Max	27.0 GHz

[SENSe]:FREQuency:MODE

This command switches between time domain (CW | FIXed) and frequency domain (SWEep).

Remote Command	[:SENSe] :FREQuency:MODE CW FIXed SWEep [:SENSe] :FREQuency:MODE?
Example	FREQ:MODE CW
Remote Command Notes	FSE, FSP, FSU, ESU, FSV [SENSe[1]]2]:FREQuency:MODE CW FIXed SWEep FSL [SENSe[1]]2]:FREQuency:MODE CW FIXed SWEep SCAN
Preset	SWEep

Range	CW FIXed SWEep
Backwards Compatibility SCPI	:SENSe1:FREQuency:MODE
[SENSe]:FREQuency:OFFSet	
Specifies the instrument's frequency offset.	
Remote Command	[:SENSe] :FREQuency:OFFSet <freq> [:SENSe] :FREQuency:OFFSet?
Example	FREQ:OFFS 10MHz
Remote Command Notes	FSE, FSP, FSU, ESU [SENSe[1]]2]:FREQuency:OFFSet <numeric_value> FSL, FSV [SENSe[1]]2]:FREQuency:OFFSet -100GHz...100GHz
Preset	0 Hz
State Saved	Saved in instrument state.
Min	-500 GHz
Max	500 GHz
Backwards Compatibility SCPI	:SENSe1:FREQuency:OFFSet

SENSe:POWer Subsystem

The SENSe:POWer subsystem controls the instrument's channel and adjacent channel power measurements.

[SENSe]:POWer:ACHannel:SPACing:CHANnel

Specifies the channel spacing for the carrier signals. This command is available only for measurements in the frequency domain (span > 0).

Remote Command	[:SENSe] :POWer:ACHannel:SPACing:CHANnel 1000 [:SENSe] :POWer:ACHannel:SPACing:CHANnel
Example	POW:ACH:SPAC:CHAN 2000 POW:ACH:SPAC:CHAN?

Compatible SCPI Commands
Supported SCPI Commands

Remote Command Notes	FSP [SENSe[1] 2]:POWer:ACHannel:SPACing:CHANnel 100 Hz to 2000 MHz FSU, ESU [SENSe[1] 2]:POWer:ACHannel:SPACing:CHANnel[1] 2]...[11 100 Hz to 2000 MHz FSL [SENSe[1] 2]:POWer:ACHannel:SPACing:CHANnel[1] 2]...[11 14kHz to 2000 MHz FSV [SENSe[1] 2]:POWer:ACHannel:SPACing:CHANnel[1] 2]...[11 14kHz to 20 GHz
Preset	20 kHz
State Saved	Saved in instrument state.
Min	100 Hz
Max	2 GHz

[SENSe]:POWer:ACHannel:SPACing:ACHannel

Specifies the channel spacing of the adjacent channel to the TX channel. At the same time, the spacing of alternate adjacent channels 1 and 2 is set to double or triple the entered value.

This command is available only in the frequency domain (span > 0).

Remote Command	[:SENSe] :POWer:ACHannel:SPACing:ACHannel <freq> [:SENSe] :POWer:ACHannel:SPACing:ACHannel?
Example	POW:ACH:SPAC:ACH 33kHz
Remote Command Notes	FSE, FSU, ESU [SENSe[1] 2]:POWer:ACHannel:SPACing:ACHannel 0 Hz to 1000 MHz FSP [SENSe[1] 2]:POWer:ACHannel:SPACing:ACHannel 100 Hz to 2000 MHz FSL [SENSe[1] 2]:POWer:ACHannel:SPACing[:ACHannel] 100 Hz to 2000 MHz FSV [SENSe[1] 2]:POWer:ACHannel:SPACing[:ACHannel] 100 Hz to 20 GHz
Preset	FSE 24kHz FSP, FSU, ESU, FSL, FSV 14kHz
State Saved	Saved in instrument state.
Min	100Hz

Max 2000MHz

[SENSe]:POWer:ACHannel:SPACing:ALternate

Specifies the spacing between the first (ALternate1) or second alternate adjacent channel (ALternate2) and the TX channel.

Remote Command	[:SENSe]:POWer:ACHannel:SPACing:ALternate[1] 2 <freq> [:SENSe]:POWer:ACHannel:SPACing:ALternate[1] 2?
Example	POW:ACH:SPAC:ALT1 100kHz
Remote Command Notes	FSE [SENSe[1] 2]:POWer:ACHannel:SPACing:ACHannel 0 Hz to 1000 MHz FSP [SENSe[1] 2]:POWer:ACHannel:SPACing:ALternate[1] 2 100 Hz to 2000 MHz FSU, ESU, FSL [SENSe[1] 2]:POWer:ACHannel:SPACing:ALternate[1] 2 ... 11 100 Hz to 2000 MHz FSV [SENSe[1] 2]:POWer:ACHannel:SPACing:ALternate[1] 2 ... 11 100 Hz to 20 GHz
Preset	FSE 24kHz FSP 40000 60000 FSU, ESU, FSL 40 kHz (ALT1) 60 kHz (ALT2) 80 kHz (ALT3) 100 kHz (ALT4) 120 kHz (ALT5) 140 kHz (ALT6) 160 kHz (ALT7) 180 kHz (ALT8) 200 kHz (ALT9) 220 kHz (ALT10) 240 kHz (ALT11)
State Saved	Saved in instrument state.
Min	100Hz
Max	2000MHz

[SENSe]:POWer:ACHannel:TXChannel:COUNT

Specifies the number of carrier signals. This command is only available for multicarrier channel and adjacent-channel power measurements.

Remote Command	[:SENSe]:POWer:ACHannel:TXChannel:COUNT <int> [:SENSe]:POWer:ACHannel:TXChannel:COUNT?
Example	POW:ACH:TXCH:COUN 1 POW:ACH:TXCH:COUN?

Compatible SCPI Commands
Supported SCPI Commands

Remote Command Notes	FSP [SENSe[1] 2]:POWer:ACHannel:TXCHannel:COUNt 1 2 3 4 FSU, ESU, FSL [SENSe[1] 2]:POWer:ACHannel:TXCHannel:COUNt 1 to 12 FSV [SENSe[1] 2]:POWer:ACHannel:TXCHannel:COUNt 1 to 18
Preset	FSP, FSU, ESU 4 FSL 1
State Saved	Saved in instrument state.
Min	1
Max	4

[SENSe]:POWer:ACHannel:ACPairs

Specifies the number of adjacent channels (upper and lower channel in pairs).The number 0 represents a pure channel power measurement.

Remote Command	[:SENSe] :POWer:ACHannel:ACPairs [:SENSe] :POWer:ACHannel:ACPairs?
Example	POW:ACH:ACP 3
Remote Command Notes	FSE, FSP [SENSe[1] 2]:POWer:ACHannel:ACPairs 1 2 3 FSU, ESU, FSL, FSV [SENSe[1] 2]:POWer:ACHannel:ACPairs 0 to 12
Preset	1
Range	0 1 2 3

[SENSe]:POWer:ACHannel:BANDwidth|BWIDth[:CHANnel]

Specifies the radio communication system's channel bandwidth.

Remote Command	[:SENSe] :POWer:ACHannel:BANDwidth BWIDth[:CHANnel] <freq> [:SENSe] :POWer:ACHannel:BANDwidth BWIDth[:CHANnel]?
Example	POW:ACH:BWID 30kHz

Compatible SCPI Commands
Supported SCPI Commands

Remote Command Notes	FSE [SENSe[1]]2:POWer:ACHannel:BANDwidth BWIDth[:CHANnel] 0 Hz to 1000 MHz FSP, FSU, ESU, FSL [SENSe[1]]2:POWer:ACHannel:BANDwidth BWIDth[:CHANnel] 100 Hz to 1000 MHz FSV [SENSe[1]]2:POWer:ACHannel:BANDwidth BWIDth[:CHANnel] 100 Hz to 40 GHz
Preset	XA, FSP, FSU, ESU, FSL 14kHz FSE 24kHz
State Saved	Saved in instrument state.
Min	100Hz
Max	1000MHz

[SENSe]:POWer:ACHannel:BANDwidth|BWIDth:ACHannel

Specifies the radio transmission system's adjacent channel bandwidth. If the adjacent channel bandwidth is changed, all alternate adjacent channel's bandwidths are automatically set to the same value.

Remote Command	[:SENSe] :POWer:ACHannel:BANDwidth BWIDth:ACHannel <freq> [:SENSe] :POWer:ACHannel:BANDwidth BWIDth:ACHannel?
Example	POW:ACH:BWID:ACH 30kHz
Remote Command Notes	FSE [SENSe[1]]2:POWer:ACHannel:BANDwidth BWIDth:ACHannel 0 Hz to 1000 MHz FSP, FSU, ESU, FSL [SENSe[1]]2:POWer:ACHannel:BANDwidth BWIDth:ACHannel 100 Hz to 1000 MHz FSV [SENSe[1]]2:POWer:ACHannel:BANDwidth BWIDth:ACHannel 100 Hz to 40 GHz
Preset	XA, FSP, FSU, ESU, FSL 14kHz FSE 24kHz
State Saved	Saved in instrument state.
Min	100Hz
Max	1000MHz

[SENSe]:POWer:ACHannel:BANDwidth|BWIDth:ALTernate

Specifies the radio transmission system's channel bandwidth for the first and second alternate adjacent channel. If alternate adjacent channel 1's bandwidth is changed, then alternate adjacent channel 2's bandwidth is automatically set to the same value.

Remote Command	[:SENSe] :POWer:ACHannel:BANDwidth BWIDth:ALTernate[1] 2 <freq> [:SENSe] :POWer:ACHannel:BANDwidth BWIDth:ALTernate[1] 2?
Example	POW:ACH:BWID:ALT2 30kHz
Remote Command Notes	FSE [SENSe[1] 2]:POWer:ACHannel:BANDwidth BWIDth:ALTernate[1] 2 0 Hz to 1000 MHz FSP [SENSe[1] 2]:POWer:ACHannel:BANDwidth BWIDth:ALTernate[1] 2 100 Hz to 1000 MHz FSU, ESU, FSL [SENSe[1] 2]:POWer:ACHannel:BANDwidth BWIDth:ALTernate[1] 2 ... 11 100 Hz to 1000 MHz FSV [SENSe[1] 2]:POWer:ACHannel:BANDwidth BWIDth:ALTernate[1] 2 ... 11 100 Hz to 40 GHz
Preset	XA, FSP, FSU, ESU, FSL 14kHz FSE 24kHz
State Saved	Saved in instrument state.
Min	100Hz
Max	1000MHz

[SENSe]:POWer:ACHannel:MODE

Switches between absolute and relative adjacent channel measurements.

Remote Command	[:SENSe] :POWer:ACHannel:MODE ABSolute RELative [:SENSe] :POWer:ACHannel:MODE?
Example	POW:ACH:MODE REL
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1] 2]:POWer:ACHannel:MODE ABSolute RELative
Preset	ABSolute

State Saved	Saved in instrument state.
Range	ABSolute RELative

[SENSe]:POWer:ACHannel:REference:AUTO ONCE

Sets the relative measurement's reference value to the currently measured channel power.

This command is accepted, but takes no action and reports no error.

Remote Command	[:SENSe] :POWer:ACHannel:REference:AUTO ONCE
Example	POW:ACH:REF:AUTO ONCE
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:POWer:ACHannel:REference:AUTO ONCE
State Saved	Saved in instrument state.

[SENSe]:POWer:ACHannel:REference:TXCHannel:AUTO

Activates the automatic selection of the transmission channel that is used as a reference channel in relative adjacent-channel power measurements.

Remote Command	[:SENSe] :POWer:ACHannel:REference:TXCHannel:AUTO MINimum MAXimum LHIGhest [:SENSe] :POWer:ACHannel:REference:TXCHannel:AUTO?
Example	SENS:POW:ACH:REF:TXCH:AUTO MIN
Remote Command Notes	FSP, FSL, FSV [SENSe[1]]2]:POWer:ACHannel:REference:TXCHannel:AUTO MINimum MAXimum LHIGhest FSU, ESU [SENSe[1]]2]:POWer:ACHannel:REference:TXCHannel:AUTO MINimum MAXimum LHIGhest OFF
State Saved	Saved in instrument state.
Range	MINimum MAXimum LHIGhest

[SENSe]:POWer:ACHannel:REference:TXCHannel:MANual

Selects the transmission channel to use as a reference channel in relative adjacent-channel power measurements.

Compatible SCPI Commands
Supported SCPI Commands

The command is only available for multicarrier and adjacent-channel power measurements.

Remote Command	[:SENSe]:POWer:ACHannel:REference:TXChannel:MANual 1 2 [:SENSe]:POWer:ACHannel:REference:TXChannel:MANual?
Example	POW:ACH:REF:TXCH:MAN 2 POW:ACH:REF:TXCH:MAN?
Remote Command Notes	FSP [SENSe[1]]2]:POWer:ACHannel:REference:TXChannel:MANual 1 2 3 4 FSU, ESU, FSL [SENSe[1]]2]:POWer:ACHannel:REference:TXChannel:MANual 1 to 12 FSV [SENSe[1]]2]:POWer:ACHannel:REference:TXChannel:MANual 1 to 18
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	2

[SENSe]:POWer:ACHannel:PRESet

Adjusts the frequency span, the measurement bandwidths including the required detector for the number of channels, the channel bandwidths, and the channel spacings selected in the active power measurement. If required, switches on the adjacent-channel power measurement prior to the adjustment.

Remote Command	[:SENSe]:POWer:ACHannel:PRESet ACPower CPOWer MCACpower OBANdwidth OBWidth CN CN0
Example	SENS:POW:ACH:PRES ACP
Remote Command Notes	FSE [SENSe[1]]2]:POWer:ACHannel:PRESet ACPower CPOWer OBANdwidth OBWidth CN CN0 ADJust FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:POWer:ACHannel:PRESet ACPower CPOWer MCACpower OBANdwidth OBWidth CN CN0
State Saved	No
Range	ACPower CPOWer MCACpower OBANdwidth OBWidth CN CN0

[SENSe]:POWer:ACHannel:PRESet:RLEVel

Adjusts the reference level to the measured channel power. If required, switches on the adjacent channel power measurement.

This command is accepted, but takes no action and reports no error.

Remote Command	[:SENSe] :POWer:ACHanne1:PRESet:RLEVel
Example	SENS:POW:ACH:PRES:RLEV
Remote Command Notes	FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:POWer:ACHannel:PRESet:RLEVel

[SENSe]:POWer:BANDwidth|BWIDth

Specifies the power percentage with respect to the total power.

Remote Command	[:SENSe] :POWer:BANDwidth BWIDth <real> [:SENSe] :POWer:BANDwidth BWIDth?
Example	POW:BAND 99.0 POW:BAND?
Remote Command Notes	FSE [SENSe[1]]2]:POWer:BANDwidth BWIDth 0 to 100PCT FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:POWer:BANDwidth BWIDth 10 to 99.9PCT
Preset	99PCT
State Saved	Saved in instrument state.
Min	10
Max	99.99

[SENSe]:POWer:HSPeed

Switches on or off the high-speed channel or adjacent channel power measurement.

Remote Command	[:SENSe] :POWer:HSPeed ON OFF 1 0 [:SENSe] :POWer:HSPeed?
Example	POW:HSP ON POW:HSP?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:POWer:HSPeed ON OFF
Preset	OFF

State Saved Saved in instrument state.

[SENSe]:POWer:NCORrection

Switches on or off the instrument inherent noise correction for channel power measurement.

Remote Command	<code>[:SENSe]:POWer:NCORrection ON OFF 1 0</code> <code>[:SENSe]:POWer:NCORrection?</code>
Example	POW:NCOR ON POW:NCOR?
Remote Command Notes	FSP, FSU, ESU [SENSe[1] 2]:POWer:NCORrection ON OFF FSV [SENSe[1] 2]:POWer:NCORrection ON OFF AUTO
Preset	OFF
State Saved	Saved in instrument state.

[SENSe]:POWer:TRACe

Assigns the channel or adjacent channel power measurement to the indicated trace in the selected measurement window.

This command is accepted, but takes no action and reports no error.

Remote Command	<code>[:SENSe]:POWer:TRACe <int></code> <code>[:SENSe]:POWer:TRACe?</code>
Example	SENS:POW:TRAC 1 SENS:POW:TRAC?
Remote Command Notes	FSP, FSU, ESU [SENSe[1] 2]:POWer:TRACe 1 2 3 FSL, FSV [SENSe[1] 2]:POWer:TRACe 1 2 3 4 5 6
State Saved	Saved in instrument state.
Min	1
Max	3

SENSe:ROSCillator Subsystem

The SENSe:ROSCillator subsystem controls the reference oscillator. The numeric suffix in SENSe is irrelevant for the commands in this subsystem.

[SENSe]:ROSCillator:SOURce

Switches between an external or internal reference oscillator for frequency processing of external generators 1 and 2.

Remote Command	[:SENSe]:ROSCillator:SOURce INTernal EXTernal [:SENSe]:ROSCillator:SOURce?
Example	ROSC:SOUR EXT
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1] 2]:ROSCillator:SOURce INTernal EXTernal
Preset	INT
State Saved	Yes.
Range	INTernal EXTernal

SENSe:SWEep Subsystem

The SENSe:SWEep subsystem controls the sweep parameters.

[SENSe]:SWEep:TIME

Specifies sweep time.

Remote Command	[:SENSe]:SWEep:TIME <time> [:SENSe]:SWEep:TIME?
Example	SWE:TIME 500ms
Remote Command Notes	FSE, FSL, FSV [SENSe[1] 2]:SWEep:TIME <numeric_value> FSP, FSU, ESU [SENSe[1] 2]:SWEep:TIME 2,5ms to 16000s (frequency domain) 1μs to 16000s (time domain)
Preset	1ms
State Saved	Saved in instrument state.
Min	1 ms
Max	4000 s

[SENSe]:SWEep:TIME:AUTO

Automatically couples sweep time to the frequency span and bandwidth settings.

Remote Command	[:SENSe] :SWEep :TIME :AUTO OFF ON 0 1 [:SENSe] :SWEep :TIME :AUTO ?
Example	SWE:TIME:AUTO OFF
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:SWEep:TIME:AUTO ON OFF
Preset	ON
State Saved	Saved in instrument state.

[SENSe]:SWEep:COUNT

Specifies the number of single sweeps that are used to calculate the average or maximum value.

SCPILC mode supports the maximum value of 10000, not 32767 as in the emulated instruments.

Remote Command	[:SENSe] :SWEep :COUNT <int> [:SENSe] :SWEep :COUNT ?
Example	SENS:SWE:COUN 1000 SENS:SWE:COUN ?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:SWEep:COUNT 0 to 32767
Preset	0
State Saved	Saved in instrument state.
Min	0
Max	40000

[SENSe]:SWEep:EGATe

Switches on or off sweep control by an external gate signal.

Remote Command	[:SENSe] :SWEep :EGATe ON OFF 1 0 [:SENSe] :SWEep :EGATe ?
Example	SWE:EGAT ON SWE:EGAT ?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:SWEep:EGATe ON OFF
Preset	OFF
State Saved	Saved in instrument state.

[SENSe]:SWEep:EGATe:TYPE

Specifies the external gate signal's triggering type (level or edge).

Remote Command	[:SENSe]:SWEep:EGATe:TYPE LEVel EDGE [:SENSe]:SWEep:EGATe:TYPE?
Example	SWE:EGAT:TYPE LEVel SWE:EGAT:TYPE?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:SWEep:EGATe:TYPE LEVel EDGE
Preset	EDGE
State Saved	Saved in instrument state.
Range	LEVel EDGE

[SENSe]:SWEep:EGATe:POLarity

Specifies the external gate signal's polarity.

Remote Command	[:SENSe]:SWEep:EGATe:POLarity POSitive NEGative [:SENSe]:SWEep:EGATe:POLarity?
Example	SWE:EGAT:POL NEG SWE:EGAT:POL?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV [SENSe[1]]2]:SWEep:EGATe:POLarity POSitive NEGative
Preset	POSitive
State Saved	Saved in instrument state.
Range	POSitive NEGative

[SENSe]:SWEep:EGATe:HOLDoff

For edge triggering, specifies the instrument's holdoff time.

Remote Command	[:SENSe]:SWEep:EGATe:HOLDoff <time> [:SENSe]:SWEep:EGATe:HOLDoff ?
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Compatible SCPI Commands
Supported SCPI Commands

Example	SWE:EGAT:HOLD 0.0002 SWE:EGAT:HOLD?
Remote Command Notes	FSE, [SENSe[1]]2]:SWEep:EGATe:HOLDoff 0 to 100s FSP, FSU, ESU, FSL [SENSe[1]]2]:SWEep:EGATe:HOLDoff 125 ns to 100 s FSV [SENSe[1]]2]:SWEep:EGATe:HOLDoff 125 ns to 30 s
Preset	0
State Saved	Saved in instrument state.
Min	125ns
Max	100s

[SENSe]:SWEep:EGATe:LENGth

For edge triggering, specifies the time interval during which the instrument sweeps.

Remote Command	[:SENSe]:SWEep:EGATe:LENGth <time> [:SENSe]:SWEep:EGATe:LENGth?
Example	SWE:EGAT:LENG 1 SWE:EGAT:LENG?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL [SENSe[1]]2]:SWEep:EGATe:LENGth 0 to 100s FSV [SENSe[1]]2]:SWEep:EGATe:LENGth 125ns to 30s
Preset	XA 1.25e-7 FSE, FSU, ESU, FSL, FSP 0 FSV 400US
State Saved	Saved in instrument state.
Min	0
Max	100s

[SENSe]:SWEep:EGATe:SOURce

Switches between an external gate signal and an IF power signal as the signal source for the gate mode.

Remote Command	[:SENSe]:SWEep:EGATe:SOURce EXTernal IFPower RFPower [:SENSe]:SWEep:EGATe:SOURce?
Example	SENS:SWE:EGAT:SOUR EXT SENS:SWE:EGAT:SOUR?
Remote Command Notes	FSE [SENSe[1]]2]:SWEep:EGATe:SOURce EXTernal RFPower FSP [SENSe[1]]2]:SWEep:EGATe:SOURce EXTernal IFPower RFPower FSU, ESU [SENSe[1]]2]:SWEep:EGATe:SOURce EXTernal IFPower FSL [SENSe[1]]2]:SWEep:EGATe:SOURce EXTernal IFPower VIDEo FSV [SENSe[1]]2]:SWEep:EGATe:SOURce EXTernal IFPower VIDEo RFPower PSEN
Preset	FSE EXTernal FSP, FSU, ESU, FSL, FSV IFPower
Range	EXTernal IFPower RFPower

[SENSe]:SWEep:POINts

Specifies the number of measurement points for one sweep run.

Remote Command	[:SENSe]:SWEep:POINts <integer> [:SENSe]:SWEep:POINts?
Example	SWE:POIN 251 SWE:POIN?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	FSP [SENSe[1]]2]:SWEep:POINts 125 to 8001 FSU, ESU [SENSe[1]]2]:SWEep:POINts 155, 313, 625, 1251, 1999, 2501, 5001, 10001, 20001, 30001 FSL, FSV [SENSe[1]]2]:SWEep:POINts 101...32001
Preset	FSP, FSL FSU, ESU FSV 501 625 691 FSU, ESU FSV 501 625 691
State Saved	Saved in instrument state.
Min	1
Max	40001

STATus Subsystem

The STATus subsystem provides the status reporting system commands. The status registers are not influenced by *RST.

STATus:OPERation[:EVENT]?

Queries the contents of the EVENT section in the STATus:OPERation register. After the readout, the contents of the EVENT section are deleted.

Remote Command	:STATus:OPERation[:EVENT]?
Example	STAT:OPER?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:OPERation[:EVENT]?
Preset	0

STATus:OPERation:CONDition?

Queries the CONDition section in the STATus:OPERation register. The current hardware status is reflected in the value returned. The contents of the CONDition section are not deleted after the readout.

Remote Command	:STATus:OPERation:CONDition
Example	STAT:OPER:COND?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:OPERation:CONDition?
Preset	0

STATus:OPERation:ENABle

Specifies the bits of the ENABle section in the STATus:OPERation register.

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:OPERation:ENABle <integer> :STATus:OPERation:ENABle?
Example	STAT:OPER:ENAB 1
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:OPERation:ENABle 0 to 65535
Preset	0
Min	0
Max	32767

STATus:OPERation:PTRansition

Specifies the edge detectors of all bits in the STATus:OPERation register from 0 to 1 for the transitions of the CONDition bit.

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:OPERation:PTRansition <integer> :STATus:OPERation:PTRansition?
Example	STAT:OPER:PTR 1
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:OPERation:PTRansition 0 to 65535
Preset	32767

Compatible SCPI Commands

Supported SCPI Commands

Min	0
Max	32767
SCPI Status Bits/OPC Dependencies	Sequential command

STATus:OPERation:NTRansition

Specifies the edge detectors of all bits in the STATus:OPERation register from 1 to 0 for the transitions of the CONDition bit.

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:OPERation:NTRansition <integer> :STATus:OPERation:NTRansition?
Example	STAT:OPER:NTR 1
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:OPERation:NTRansition 0 to 65535
Preset	0
Min	0
Max	32767
SCPI Status Bits/OPC Dependencies	Sequential command

STATus:PRESet

Resets the edge detectors and ENABLE parts of all registers to a defined value.

Remote Command	:STATus:PRESet
Example	STAT:PRES
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:PRESet

STATus:QUEStionable[:EVENT]

Queries the contents of the EVENT section in the STATus:QUEStionable register. After the readout, the contents of the EVENT section are deleted.

Remote Command	:STATus:QUEStionable[:EVENT]?
Example	STAT:QUES?

Compatible SCPI Commands
Supported SCPI Commands

Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable[:EVENT]?
Preset	0

STATus:QUEStionable:CONDition

Queries the CONDition section in the STATus:QUEStionable register. The contents of the CONDition section are not deleted after a readout.

Remote Command	:STATus:QUEStionable:CONDition?
Example	STAT:QUES:COND?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:CONDition?
Preset	0

STATus:QUEStionable:ENABLE

Specifies the bits of the ENABLE section in the STATUS-QUEStionable register. The

ENABLE register selectively enables individual events in the associated EVENT section for the summary bit in the status byte.

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:QUEStionable:ENABLE <integer> :STATus:QUEStionable:ENABLE?
Example	:STATus:QUEStionable:ENABLE 16
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:ENABLE 0 to 65535
Preset	0
Min	0
Max	32767

STATus:QUEStionable:PTRansition

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:QUEStionable:PTRansition <integer>. :STATus:QUEStionable:PTRansition?
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Compatible SCPI Commands

Supported SCPI Commands

Example	STAT:QUES:PNTR 16
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:PTRansition 0 to 65535
Preset	0
Min	0
Max	32767

STATus:QUEStionable:NTRansition

Specifies the edge detectors of all bits in the STATus:OPERation register from 1 to 0 for the transitions of the CONDition bit.

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:QUEStionable:NTRansition <integer>. :STATus:QUEStionable:NTRansition?
Example	STAT:QUES:NTR 16
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:NTRansition 0 to 65535
Preset	0
Min	0
Max	32767

STATus:QUEStionable:FREQuency[:EVENT]

Queries the contents of the EVENT section in the STATus:QUEStionable:FREQuency register.

Remote Command	:STATus:QUEStionable:FREQuency[:EVENT]?
Example	STAT:QUES:FREQ?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:FREQuency[:EVENT]?
Preset	0

STATus:QUEStionable:FREQuency:CONDition

Queries the contents of the CONDition section in the

STATus:QUEStionable:FREQuency register. The contents of the CONDition section are not deleted after a readout.

Remote Command	:STATus:QUEStionable:FREQuency:CONDition?
Example	STAT:QUES:FREQ:COND?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:FREQuency:CONDition?
Preset	0

STATus:QUEStionable:FREQuency:ENABLE

Specifies the bits of the ENABle section in the STATus:QUEStionable:FREQuency register.

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:QUEStionable:FREQuency:ENABle <integer> :STATus:QUEStionable:FREQuency:ENABle?
Example	STAT:QUES:FREQ:ENAB 2
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:FREQuency:ENABle 0 to 65535
Preset	32767
Min	0
Max	32767

STATus:QUEStionable:FREQuency:PTRansition

Specifies the edge detectors of all bits in the STATus:QUEStionable:FREQuency register from 0 to 1 for the transitions of the CONDition bit.

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:QUEStionable:FREQuency:PTRansition <integer> :STATus:QUEStionable:FREQuency:PTRansition?
Example	STAT:QUES:FREQ:PTR 2
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:FREQuency:PTRansition 0 to 65535
Preset	32767
Min	0

Max

32767

STATus:QUEStionable:FREQuency:NTRansition

Specifies the edge detectors of all bits in the STATus:QUEStionable:FREQuency register from 1 to 0 for the transitions of the CONDition bit.

This mode supports the maximum value of 32767, not 65535 as in the emulated instruments.

Remote Command	:STATus:QUEStionable:FREQuency:NTRansition <integer> :STATus:QUEStionable:FREQuency:NTRansition?
Example	STAT:QUES:FREQ:NTR 2
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEStionable:FREQuency:NTRansition 0 to 65535
Preset	0
Min	0
Max	32767

STATus:QUEue[:NEXT]?

Returns the earliest entry to the error queue then deletes it.

Remote Command	:STATus:QUEue[:NEXT]?
Example	STAT:QUE?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV STATus:QUEue[:NEXT]?

SYSTem Subsystem

This subsystem includes commands for general functions.

SYSTem:COMMunicate:GPIB[:SELF]:ADDRess

Changes the analyzer's IEC/IEEE-bus address.

Changing this address may require further communication to use the new address.

Remote Command	:SYSTem:COMMunicate:GPIB[:SELF]:ADDRess <integer> :SYSTem:COMMunicate:GPIB[:SELF]:ADDRess?
Example	:SYST:COMM:GPIB:ADDR 17

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes	Changing the Address on the GPIB port requires all further communication to use the new address. FSE, FSP, FSU, ESU, FSL, FSV SYSTem:COMMunicate:GPIB[:SELF]:ADDRes 0 to 30
State Saved	No
Range	0 to 30
Min	0
Max	30

SYSTem:COMMunicate:GPIB[:SELF]:RTERminator

This command changes the GPIB receive terminator.

According to the standard the terminator in ASCII is <LF> and/or <EOI>. For binary data transfers (e.g., trace data) from the control computer to the instrument, the binary code (OAH) used for <LF> might be included in the binary data block, and therefore should not be interpreted as a terminator in this particular case. This can be avoided by changing the receive terminator to EOI.

Output of binary data from the instrument to the control computer does not require such a terminator change.

Currently, this command won't invoke any action.

Remote Command	:SYSTem:COMMunicate:GPIB[:SELF]:RTERminator LFEOI EOI :SYSTem:COMMunicate:GPIB[:SELF]:RTERminator?
Example	SYST:COMM:GPIB:RTER LFEOI SYST:COMM:GPIB:RTER?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV SYSTem:COMMunicate:GPIB[:SELF]:RTERminator LFEOI EOI Currently, this command won't invoke any action.
Preset	LFEOI

SYSTem:DATE

Sets or queries the date portion of the analyzer's internal clock.

Remote Command	:SYSTem:DATE <year>,<month>,<day> :SYSTem:DATE?
Example	:SYST:DATE 2006,05,26
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV SYSTem:DATE 1980 to 2099, 1 to 12, 1 2 31

SYSTem:DISPlay:FPANel

Turns the on-screen display of front panel keys on or off.

Remote Command	SYSTem:DISPlay:FPANel SYSTem:DISPlay:FPANel?
Example	:SYST:DISP:FPAN ON :SYST:DISP:FPAN?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV SYSTem:DISPlay:FPANel ON OFF
Preset	ON
State Saved	No

SYSTem:DISPlay:UPDate

This command is accepted, but takes no action and reports no error.

Remote Command	:SYSTem:DISPlay:UPDate ON OFF 1 0 :SYSTem:DISPlay:UPDate?
Example	SYST:DISP:UPD ON
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV SYSTem:DISPlay:UPDate ON OFF
Preset	ON

SYSTem:ERRor?

Queries the first (oldest) entry in the error queue, then deletes that entry.

Remote Command	:SYSTem:ERRor[:NEXT]?
Example	:SYST:ERR?
Remote Command Notes	FSE, FSP, FSU, ESU SYSTem:ERRor? FSL, FSV SYSTem:ERRor[:NEXT]?

SYSTem:ERRor:LIST?

This command is accepted, but takes no action and reports no error.

Remote Command	:SYSTem:ERRor:LIST?
Example	:SYST:ERR:LIST?

Compatible SCPI Commands

Supported SCPI Commands

Remote Command Notes FSP, FSU, ESU, FSL, FSV
 SYSTem:ERRor:LIST?

SYSTem:ERRor:CLEar:ALL

This command is accepted, but takes no action and reports no error.

Remote Command	:SYSTem:ERRor:CLEar:ALL
Example	:MMEM:CLE:ALL
Remote Command Notes	FSP, FSU, ESU, FSL, FSV SYSTem:ERRor:CLEar:ALL

SYSTem:PRESet

Initiates a reset of the analyzer.

Remote Command	:SYSTem:PRESet
Example	:SYST:PRES
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV SYSTem:PRESet

SYSTem:TIME

Sets or queries the time portion of the analyzer's internal clock. The sequence of entry is hour, minute, second.

Remote Command	:SYSTem:TIME <hour>,<minute>,<second> :SYSTem:TIME?
Example	:SYST:TIME 13,05,26
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV SYSTem:TIME 0 to 23, 0 to 59, 0 to 59

SYSTem:VERSion

Queries the analyzer's SCPI version number.

This command is a query and therefore has no *RST value.

Remote Command	:SYSTem:VERSion?
Example	:SYST:VERS?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV SYSTem:VERSion?

TRACe Subsystem

TRACe[:DATA]

The command writes trace data from the control computer to the specified trace of the analyzer.

The TRACe[:DATA] command is of the form:

:TRACe:DATA <trace>,<data>

where <trace> may be one of the following parameters:

TRACE1, TRACE2, TRACE3, TRACE4, TRACE5, TRACE6

and where <data> may be either:

- ASCII data, consisting of a set of comma-separated values, or,
- **REAL** or **INT**eger, sent as a definite length block, with a header describing the data to follow.

The query reads the specified trace data from the analyzer to the control computer.

Remote Command	:TRACe[1][:DATA] TRACE1 TRACE2 TRACE3 TRACE4 TRACE5 TRACE6,<data> :TRACe[1][:DATA]? TRACE1 TRACE2 TRACE3 TRACE4 TRACE5 TRACE6
Example	TRAC? TRACE1
Remote Command Notes	FSE TRACe[:DATA] TRACE1 TRACE2 TRACE3 TRACE4, <block> <numeric_value> FSP TRACe[1]2[:DATA] TRACE1 TRACE2 TRACE3, PWCDp CTABle SPURious, <block> <numeric_value> FSU, ESU TRACe[1]2[:DATA] TRACE1 TRACE2 TRACE3 LIST SPURious ABITstream PWCDp CTABle, <block> <numeric_value> FSL TRACe[1]2[:DATA] TRACE1 TRACE2 TRACE3 TRACE4 TRACE5 TRACE6 LIST SPURious,<block> <numeric_value> FSV(query only) TRACe[1]2[:DATA]? TRACE1 TRACE2 TRACE3 TRACE4 TRACE5 TRACE6 LIST SPURious SPECTrogram SGRam

TRACe:IQ Subsystem

This subsystem includes commands for handling measured I/Q data.

TRACe:IQ:DATA

This query causes a measurement to be performed, then returns a list of measurement results. The results are corrected for frequency response before being returned.

Before sending this query, specify the measurement settings using **“TRACe:IQ:SET”** on page 183.

Remote Command	:TRACe[1]:IQ:DATA?
Example	TRAC:IQ:DATA?
Remote Command Notes	FSP, FSU, ESU, FSL, FSV TRACe[1]:IQ:DATA?

TRACe:IQ:SET

Specifies the analyzer settings for measurement of I/Q data.

Remote Command	TRACe[1]:IQ:SET <filter type>,<rbw>,<sample rate>,<trigger source>,<trigger slope>,<pretrigger samples>,<# of samples>
Example	TRAC:IQ:SET NORM,10MHz,32MHz,EXT,POS,0,2048 TRAC:IQ:SET NORM,1MHz,4MHz,EXT,POS,1024,512
Remote Command Notes	FSP, FSU, ESU, FSL, FSV TRACe[1]:IQ:SET <filter type>,<rbw>,<sample rate>,<trigger source>,<trigger slope>,<pretrigger samples>,<# of samples>

TRACe:IQ:SRATe

Specifies the sampling rate for I/Q data acquisition.

Remote Command	TRACe[1]:IQ:SRATe <freq> TRACe[1]:IQ:SRATe?
Example	TRAC:IQ:SRAT 4MHZ TRAC:IQ:SRAT?
Remote Command Notes	FSP, FSU, ESU TRACe[1]:IQ:SRATe 15.625kHz to 32MHz FSL TRACe[1]:IQ:SRATe 10 kHz to 65.83 MHz FSV TRACe[1]:IQ:SRATe 100 Hz to 45 MHz
Preset	32MHz
State Saved	Saved in instrument state.

Compatible SCPI Commands
Supported SCPI Commands

Min	15.625kHz
Max	32MHz

TRACe:IQ[:STATe]

Switches the current measurement between SWEEP mode and I/Q mode.

Remote Command	:TRACe:IQ[:STATe] ON OFF 1 0 :TRACe:IQ[:STATe]?
Example	TRAC:IQ:STAT ON
Remote Command Notes	FSP, FSU, ESU, FSL, FSV TRACe[1]:IQ[:STATe] ON OFF
Preset	OFF
State Saved	Saved in instrument state.

TRIGger Subsystem

This subsystem includes commands that control and synchronize the start of a sweep.

An external trigger signal can be supplied via the connector on the analyzer's rear panel.

TRIGger[:SEQuence]:SOURce

Selects the trigger source.

This mode supports only parameter options: IMMEDIATE, EXTERNAL, VIDEO, RFPower.

It does **not** support parameter options: IFPower, TV, AF, FM, AM and PM.

Remote Command	:TRIGger[1][:SEQuence]:SOURce IMMEDIATE EXTERNAL VIDEO IFPower RFPower TV AF FM AM PM :TRIGger[1][:SEQuence]:SOURce?
Example	TRIG:SOUR EXT

Compatible SCPI Commands
Supported SCPI Commands

Remote Command Notes	FSE TRIGger[1]2[:SEquence]:SOURce IMMediate LINE EXTernal VIdео RFPower TV AF FSP TRIGger[1]2[:SEquence]:SOURce IMMediate EXTernal VIdео IFPower RFPower TV AF FM AM PM FSU, ESU TRIGger[1]2[:SEquence]:SOURce IMMediate EXTernal VIdео IFPower FSL TRIGger[1]2[:SEquence]:SOURce IMMediate (Free Run) EXTern IFPower VIdео TIME TV FSV TRIGger[1]2[:SEquence]:SOURce IMMediate (Free Run) EXTern IFPower RFPower VIdео BBPower PSEN GP0...GP5
Preset	IMMediate
Range	IMMediate EXTernal VIdео IFPower RFPower TV AF FM AM PM

TRIGger[:SEquence]:LEVel:IFPower

This command sets the level of the IF power trigger source.

This command is accepted, but takes no action and reports no error.

Remote Command	:TRIGger[1][:SEquence]:LEVel:IFPower <ampl> :TRIGger[1][:SEquence]:LEVel:IFPower?
Example	TRIG:LEV:IFP -20DBM
Remote Command Notes	FSP TRIGger[1]2[:SEquence]:LEVel:IFPower -30 to -10DBM FSU, ESU TRIGger[1]2[:SEquence]:LEVel:IFPower -70 to +30 dBm FSL TRIGger[1]2[:SEquence]:LEVel:IFPower -50 to -10 dBm FSV TRIGger[1]2[:SEquence]:LEVel:IFPower <numeric_value>
Preset	-20dBm
State Saved	Saved in instrument state.
Min	30dBm
Max	-70dBm

TRIGger[:SEQuence]:LEVel:RFPower

Sets the RF power trigger level.

This mode supports the level range:-200 to 100 dBm.

Remote Command	:TRIGger[1][:SEQuence]:LEVel:RFPower <real> :TRIGger[1][:SEQuence]:LEVel:RFPower?
Example	TRIG:LEV:RFP -20DBM
Remote Command Notes	FSP TRIGger[1]2[:SEQuence]:LEVel:RFPower -50 to -10DBM FSV TRIGger[1]2[:SEQuence]:LEVel:RFPower <numeric_value>
Preset	-20dBm
State Saved	Saved in instrument state.
Min	-200dBm
Max	100dBm

TRIGger[:SEQuence]:LEVel:VIDeo

Sets the video trigger level.

Remote Command	TRIGger[1][:SEQuence]:LEVel:VIDeo <real> TRIGger[1][:SEQuence]:LEVel:VIDeo?
Example	TRIG:LEV:VID 40 TRIG:LEV:VID?
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV TRIGger[1]2[:SEQuence]:LEVel:VIDeo 0 to 100PCT
Preset	50
State Saved	Saved in instrument state.
Min	0
Max	100

TRIGger[:SEQuence]:HOLDoff

Specifies the trigger delay period.

Remote Command	:TRIGger[1][:SEQuence]:HOLDoff <time> :TRIGger[1][:SEQuence]:HOLDoff?
Example	TRIG:HOLD 100ms

Compatible SCPI Commands
Supported SCPI Commands

Remote Command Notes	FSE, FSP, FSU, ESU TRIGger[1]2[:SEquence]:HOLDoff -100s to 100s FSL TRIGger[1]2[:SEquence]:HOLDoff[:TIME] -100s to 100s FSV TRIGger[1]2[:SEquence]:HOLDoff[:TIME] 0s to 100s
Preset	0s
State Saved	Saved in instrument state.
Min	0s
Max	0.5s

TRIGger[:SEquence]:SLOPe

Sets the trigger signal slope to positive or negative.

The trigger slope setting applies to all trigger sources.

Remote Command	:TRIGger[1][:SEquence]:SLOPe POSitive NEGative :TRIGger[1][:SEquence]:SLOPe?
Example	TRIG:SLOP NEG
Remote Command Notes	FSE, FSP, FSU, ESU, FSL, FSV TRIGger[1]2[:SEquence]:SLOPe POSitive NEGative
Preset	POSitive
State Saved	Saved in instrument state.
Range	POSitive NEGative

4 A Brief Introduction to the SCPI Language

Overview

This section is not intended to teach you everything about the SCPI (Standard Commands for Programmable Instruments) programming language. The SCPI Consortium or IEEE can provide that level of detailed information.

Programming with SCPI requires knowledge of:

- Computer programming languages
- The language of your instrument, such as MXA or FSP

Topics covered in this chapter include:

- “SCPI Language Basics” on page 189
- “Command Syntax” on page 190
- “Creating Valid Commands” on page 191
- “Special Characters in Commands” on page 193
- “Parameters in Commands” on page 193
- “Putting Multiple Commands on the Same Line” on page 196

For more information refer to:

IEEE Standard 488.1-2004, *IEEE Standard Digital Interface for Programmable Instrumentation*. New York, NY, 1998.

IEEE Standard 488.2-2004, *IEEE Standard Codes, Formats, Protocols and Comment Commands for Use with ANSI/IEEE Std 488.1-1987*. New York, NY, 1998.

SCPI Language Basics

SCPI is an ASCII-based instrument command language designed for test and measurement instruments, with the goal of reducing automatic test equipment (ATE) program development time.

SCPI accomplishes this goal by providing a consistent programming environment control and data usage. This consistent programming environment is achieved by the use of defined program messages, instrument responses, and data formats across all SCPI instruments.

By providing a consistent programming environment, replacing one SCPI instrument with another SCPI instrument in a system will usually requires less effort than with non-SCPI instrument.

SCPI is not a standard which completely provides for interchangeable instrumentation. SCPI helps move toward interchangeability by defining instrument commands and responses, but no functionality, accuracy, resolution, and so on.

Term	Description
Command	An instruction. You combine commands to form messages that control instruments to complete a specified task. In general, a command consists of mnemonics (also known as keywords), parameters and punctuation.
Query	A special type of command. Queries instruct the instrument to make response data available to the controller. Query keywords always end with a question mark, ?.

Command Syntax

A command consists of keywords, parameters and punctuation. A typical command is made up of keywords set off by colons. The keywords are followed by parameters that can be followed by optional units.

Here is an example:

SENSe:FREQuency:START 1.5 MHZ

Command Keywords	Many commands have both a long and a short form: use either one. A combination of the two is not allowed. Consider the :FREQuency command for example: – Short form is :FREQ – Long form is :FREQUENCY SCPI is not case sensitive, so fREQuency is just as valid as FREQUENCY, but FREQ and FREQUENCY are the only valid forms of the FREQuency command and FREQU is not a valid form. For example, Sens:Freq:Star 1.5 mhz is the same as SENSe:FREQUENCY:START 1.5 MHZ. In this documentation, upper case letters indicate the short form of the keyword. The lower case letters indicate the long form of the keyword.
Punctuation	– A vertical bar " " dictates a choice of one element from a list. For example: <A> indicates that either A or B can be selected, but not both. – Square brackets "[]" indicates that the enclosed items are optional. – Angle brackets "< >" indicates a variable items to be entered to represent user choices. – Braces "{ }" can optionally be used in the command either not at all, once, or several times. – A question mark "?" after a subsystem command indicates that the command is a query. The returned information, <value> varies in format according to the type of the field.

- Separator
- A colon ":" separates keywords of different levels. The colon before the root keyword is usually omitted.
 - A space separates a keyword and a parameter, as well as a parameter and a unit.

NOTE The command **SENS:FREQ:STAR** is not valid because **FREQ** is neither the short, nor the long form of the command.

Command Statement Rules Overview

Besides the standard notation of SCPI described above, please remember the following rules in programming:

- command statements read from left to right
- use either long form or short form of keywords, but do not use both
- no separating space between the keywords, only use a colon to separate keywords of different levels
- always separating a keyword from a variable with a space
- always separating a variable from its unit with a space (if variable has a unit)

Creating Valid Commands

Commands are not case sensitive and there are often many different ways of writing a particular command. These are examples of valid commands for a given command syntax:

Command Syntax	Sample Valid Commands
[SENSe:]BANDwidth[:RESolution] <freq>	The following sample commands are all identical. They all cause the same result. • Sense:Band:Res 1700 • BANDWIDTH:RESOLUTION 1.7e3 • sens:band 1.7KHZ • SENS:band 1.7E3Hz • band 1.7kHz • bandwidth:RES 1.7e3Hz
MEASure:SPECTrum[n]?	• MEAS:SPEC? • Meas:spec? • meas:spec3? The number 3 in the last meas example causes it to return different results then the commands above it. See the command description for more information.

Command Syntax	Sample Valid Commands
<code>[:SENSe]:DETECTOR[:FUNCTION] NEGative POSitive SAMPLE</code>	– <code>DET:FUNC neg</code> – <code>Detector:Func Pos</code>
<code>INITiate:CONTinuous ON OFF 1 0</code>	The sample commands below are identical. – <code>INIT:CONT ON</code> – <code>init:continuous 1</code>

Special Characters in Commands

Special Character	Meaning	Example
	A vertical stroke between parameters indicates alternative choices. The effect of the command is different depending on which parameter is selected.	Command: TRIGger:SOURce EXTernal INTernal LINE The choices are external, internal, and line. Ex: TRIG:SOURCE INT is one possible command choice.
	A vertical stroke between keywords indicates identical effects exist for both keywords. The command functions the same for either keyword. Only one of these keywords is used at a time.	Command: SENSe:BANDwidth BWIDth:OFFSet Two identical commands are: Ex1: SENSE:BWIDTH:OFFSET Ex2: SENSE:BAND:OFFSET
[]	keywords in square brackets are optional when composing the command. These implied keywords are executed even if they are omitted.	Command: [SENSe:]BANDwidth[:RESolution]:AUTO The following commands are all valid and have identical effects: Ex1: bandwidth:auto Ex2: band:resolution:auto Ex3: sense:bandwidth:auto
< >	Angle brackets around a word, or words, indicates they are not to be used literally in the command. They represent the needed item.	Command: SENS:FREQ <freq> In this command example the word <freq> should be replaced by an actual frequency. Ex: SENS:FREQ 9.7MHz.
{ }	Parameters in braces can optionally be used in the command either not at all, once, or several times.	Command: MEASure:BW <freq>{,level} A valid command is: meas:BW 6 MHz, 3 dB, 60 dB

Parameters in Commands

There are four basic types of parameters: booleans, keywords, variables and arbitrary block program data.

OFF|ON|0|1
(Boolean)

This is a two state boolean-type parameter. The numeric value 0 is equivalent to OFF. Any numeric value other than 0 is equivalent to ON. The numeric values of 0 or 1 are commonly used in the command instead of OFF or ON. Queries of the parameter always return a numeric value of 0 or 1.

keyword	The keywords that are allowed for a particular command are defined in the command syntax description.
Units	Numeric variables may include units. The valid units for a command depend on the variable type being used. See the following variable descriptions. The indicated default units are used if no units are sent. Units can follow the numerical value with, or without, a space.
Variable	A variable can be entered in exponential format as well as standard numeric format. The appropriate range of the variable and its optional units are defined in the command description. The following keywords may also be used in commands, but not all commands allow keyword variables. – DEFault - resets the parameter to its default value. – UP - increments the parameter. – DOWN - decrements the parameter. – MINimum - sets the parameter to the smallest possible value. – MAXimum - sets the parameter to the largest possible value. The numeric value for the function's MINimum, MAXimum, or DEFault can be queried by adding the keyword to the command in its query form. The keyword must be entered following the question mark. Example query: SENSE:FREQ:CENTER? MAX

Variable Parameters

<ampl>	Is a rational number followed by optional units. The default units are dBm. Acceptable units include: dBm, dBmV, dB μ V.
<angle> <degrees>	Is a rational number followed by optional units. The default units are degrees. Acceptable units include: DEG, RAD.
<bit_pattern>	Specifies a series of bits rather than a numeric value. The bit series is the binary representation of a numeric value. There are no units. Bit patterns are most often specified as hexadecimal numbers, though octal, binary or decimal numbers may also be used. In the SCPI language these numbers are specified as: – Hexadecimal, #Hdddd or #hdddd where 'd' represents a hexadecimal digit 0 to 9 and 'a' to 'f'. So #h14 can be used instead of the decimal number 20. – Octal, #Odddddd or #oddddd where 'd' represents an octal digit 0 to 7. So #o24 can be used instead of the decimal number 20. – Binary, #Bdddddddddddddd or #bdddddddddddddd where 'd' represents a 1 or 0. So #b10100 can be used instead of the decimal number 20.
<current>	Is a rational number followed by optional units. The default units are Amperes. Acceptable units include: A, mA, μ A, nA.
<freq> <bandwidth>	Is a positive rational number followed by optional units. The default unit is Hertz. Acceptable units include: Hz, kHz, MHz, GHz.
<integer>	is an integer value with no units.
<percent>	Is a rational number between 0 and 100. You can either use no units or use PCT.
<power>	Is a rational number followed by optional units. The default units are W. Acceptable units include: mAW, kW, W, mW, μ W, nW, pW.
<real>	Is a floating point number with no units.
<rel_power> <rel_ampl>	Is a positive rational number followed by optional units. The default units are dB. Acceptable units include: dB.

<string>	Is a series of alpha numeric characters.
<time> <seconds>	Is a rational number followed by optional units. The default units are seconds. Acceptable units include: ks, s, ms, us, ns.
<voltage>	Is a rational number followed by optional units. The default units are Volts. Acceptable units include: V, mV, μ V, nV

Block Program Data

Some parameters consist of a block of data. There are a few standard types of block data. Arbitrary blocks of program data can also be used.

<trace>	Is an array of rational numbers corresponding to displayed trace data. See FORMat:DATA for information about available data formats. A SCPI command often refers to a block of current trace data with a variable name such as: Trace1, TRACE2, or trace3, depending on which trace is being accessed.
<arbitrary block data>	Consists of a block of data bytes. The first information sent in the block is an ASCII header beginning with #. The block is terminated with a semi-colon. The header can be used to determine how many bytes are in the data block. There are no units. (You do not get block data if your data type is ASCII, using FORMat : DATA ASCII command. Your data is comma separated ASCII values.

Block data example: suppose the header is #512320.

- The first digit in the header (5) tells you how many additional digits/bytes there are in the header.
- The 12320 means 12 thousand, 3 hundred, 20 data bytes follow the header.
- Divide this number of bytes by your current data format (bytes/data point), either 8 (for real,64), or 4 (for real,32). For this example, if you're using real64 then there are 1540 points in the block.

Putting Multiple Commands on the Same Line

Multiple commands can be written on the same line, reducing your code space requirement. To do this:

- Commands must be separated with a semicolon (;).

- If the commands are in different subsystems, the key word for the new subsystem must be preceded by a colon (:).
- If the commands are in the same subsystem, the full hierarchy of the command key words need not be included. The second command can start at the same key word level as the command that was just executed.

SCPI Termination and Separator Syntax

All binary trace and response data is terminated with <NL><END>, as defined in Section 8.5 of IEEE Standard 488.2-1992, *IEEE Standard Codes, Formats, Protocols and Common Commands for Use with ANSI/IEEE Std 488.1-1987*. New York, NY, 1992. (Although one intent of SCPI is to be interface independent, <END> is only defined for IEEE 488 operation.)

The following are some examples of good and bad commands. The examples are created from a theoretical instrument with the simple set of commands indicated below:

```
[ :SENSe]
    :POWer
        [ :RF]
        :ATTenuation 40dB

:TRIGger
    [ :SEquence]
    :EXTeRnal [1]
    :SLOPe
        POSitive

[ :SENSe]
    :FREQuency
        :STARt
    :POWer
    [ :RF]
    :MIXer
        :RANGe
        [ :UPPer]
```

Bad Command	Good Command
PWR:ATT 40dB	POW:ATT 40dB
The short form of POWER is POW , not PWR .	
FREQ:STAR 30MHz;MIX:RANG -20dBm	FREQ:STAR 30MHz;POW:MIX:RANG -20dBm
The MIX:RANG command is in the same :SENSE subsystem as FREQ , but executing the FREQ command puts you back at the SENSE level. You must specify POW to get to the MIX:RANG command.	
FREQ:STAR 30MHz;POW:MIX RANG -20dBm	FREQ:STAR 30MHz;POW:MIX:RANG -20dBm
MIX and RANG require a colon to separate them.	
:POW:ATT 40dB;TRIG:FREQ:STAR 2.3GHz	:POW:ATT 40dB;:FREQ:STAR 2.3GHz
:FREQ:STAR is in the :SENSE subsystem, not the :TRIGGER subsystem.	
:POW:ATT?:FREQ:STAR?	:POW:ATT?;:FREQ:STAR?
:POW and FREQ are within the same :SENSE subsystem, but they are two separate commands, so they should be separated with a semicolon, not a colon.	
:POW:ATT -5dB;:FREQ:STAR 10MHz	:POW:ATT 5dB;:FREQ:STAR 10MHz
Attenuation cannot be a negative value.	



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