3 Remote Control

3.1 Introduction

The instrument is equipped with an IEC-bus interface according to standard IEC 625.1/IEEE 488.2 and two RS-232 interfaces. The connectors are located at the rear of the instrument and permits to connect a controller for remote control.

The internal controller function together with the option FSE-B17 (2nd IEC-bus interface) may also be used as a controller (see Chapter 1, Section 1.8).
In addition, the instrument is equipped with an RSIB interface that allows instrument control by Windows applications WinWord and Excel or by Visual C++ and Visual Basic programs

The instrument supports the SCPI version 1994.0 (Standard Commands for Programmable Instruments). The SCPI standard is based on standard IEEE 488.2 and aims at the standardization of device-specific commands, error handling and the status registers (see Section "SCPI Introduction").

This section assumes basic knowledge of IEC-bus programming and operation of the controller. A description of the interface commands is to be obtained from the relevant manuals. The RSIB interface functions are matched to the function interface for IEC/IEEE-bus programming from National Instruments. The functions supported by the DLLs are listed in annex A.

The requirements of the SCPI standard placed on command syntax, error handling and configuration of the status registers are explained in detail in the respective sections. Tables provide a fast overview of the commands implemented in the instrument and the bit assignment in the status registers. The tables are supplemented by a comprehensive description of every command and the status registers. Detailed program examples of the main functions are to be found in annex D.

The program examples for IEC-bus programming are all written in Quick BASIC.

3.2 Brief Instructions

The short and simple operating sequence given below permits fast putting into operation of the instrument and setting of its basic functions. As a prerequisite, the IEC-bus address, which is factory-set to 20, must not have been changed.

1. Connect instrument and controller using IEC-bus cable.

2. Write and start the following program on the controller:

```
CALL IBFIND("DEV1", receiver%)              'Open port to the instrument
CALL IBPAD(receiver%, 20)                   'Inform controller about instrument address
CALL IBWRT(receiver%, "*RST;*CLS")          'Reset instrument
CALL IBWRT(receiver%, 'FREQ:CENT 100MHz')   'Set receiver frequency to 100 MHz
CALL IBWRT(receiver%, 'INP:ATT 30DB')       'Set RF attenuation to 30 dB
CALL IBWRT(receiver%, 'DET:REC AVER')       'Select average detector
CALL IBWRT(receiver%, '*TRG')               'Start level measurement
```

The receiver measures the level at 100 MHz.

3. To return to manual control, press the *LOCAL* key at the front panel

3.3 Switchover to Remote Control

On power-on, the instrument is always in the manual operating state ("LOCAL" state) and can be operated via the front panel.
It is switched to remote control ("REMOTE" state)

IEC-bus	as soon as it receives an addressed command from a controller.
RS-232	as soon as it receives the command "@REM" from a controller.
RSIB	as soon as it receives an addressed command from a controller.

During remote control, operation via the front panel is disabled. The instrument remains in the remote state until it is reset to the manual state via the front panel or via remote control interfaces. Switching from manual operation to remote control and vice versa does not affect the remaining instrument settings.

3.3.1 Remote Control via IEC Bus

3.3.1.1 Setting the Device Address

In order to operate the instrument via the IEC-bus, it must be addressed using the set IEC-bus address. The IEC-bus address of the instrument is factory-set to 20. It can be changed manually in the *SETUP - GENERAL SETUP* menu or via IEC bus. Addresses 0 to 30 are permissible.

Manuell: Call *SETUP - GENERAL SETUP* menu
Enter desired address in table *GPIB ADDRESS*
Terminate input using one of the unit keys (=ENTER).

Via IEC bus:

```
CALL IBFIND("DEV1", receiver%)                  'Open port to the instrument
CALL IBPAD(receiver%, 20)                       'Inform controller about old address
CALL IBWRT(receiver%, "SYST:COMM:GPIB:ADDR 18") 'Set instrument to new address
CALL IBPAD(receiver%, 18)                       'Inform controller about new address
```

3.3.1.2 Indications during Remote Control

Remote control mode is indicated by the LED "REMOTE" on the instrument's front panel. In this mode the softkeys on the display are not shown.

3.3.1.3 Return to Manual Operation

Return to manual operation is possible via the front panel or the IEC bus.

Manually: Press the *LOCAL* key.

***Notes*:**
- *Before switchover, command processing must be completed as otherwise switchover to remote control is effected immediately.*
- *The LOCAL key can be disabled by the universal command LLO (see annex A) in order to prevent unintentional switchover. In this case, switchover to manual mode is only possible via the IEC bus.*
- *The LOCAL key can be enabled again by deactivating the REN line of the IEC bus (see annex A).*

Via IEC bus:

```
...
CALL IBLOC(receiver%)          'Set instrument to manual operation.
...
```

3.3.2 Remote Control via RS-232-Interface

3.3.2.1 Setting the Transmission Parameters

To enable an error-free and correct data transmission, the parameters of the unit and the controller should have the same setting. Parameters can be manually changed in menu *SETUP-GENERAL SETUP* in table *COM PORT 1/2* or via remote control using the command `SYSTem:COMMunicate:SERial1|2:...`.

The transmission parameters of the interfaces COM1 and COM2 are factory-set to the following values: baudrate = 9600, data bits = 8, stop bits = 1, parity = NONE and protocoll = NONE.

Manually: Setting interface COM1|2

Call *SETUP-GENERAL SETUP* menu

Select desired baudrate, bits, stopbit, parity and protocoll in table *COM PORT 1/2*.

Terminate input using one of the unit keys (=ENTER).

3.3.2.2 Indications during Remote Control

See Section 3.3.1.2.

3.3.2.3 Return to Manual Operation

Return to manual operation is possible via the front panel or via RS-232 interface.

Manually: Press the *LOCAL* key.

Note:
- *Before switchover, command processing must be completed as otherwise switchover to remote control is effected immediately.*
- *The LOCAL key can be disabled by the universal command LLO (see annex A) in order to prevent unintentional switchover. In this case, switchover to manual mode is only possible via the IEC bus.*
- *The LOCAL key can be enabled again by sending the command "@LOC" via RS-232 (see annex A).*

Via RS-232:

```
...
V24puts(port, "@LOC");          Set instrument to manual operation.
...
```

3.3.2.4 Limitations

The following limitations apply if the unit is remote-controlled via the RS-232-C interface:

- No interface messages
- Only the Common Commands *OPC? can be used for command synchronization, *WAI and *OPC are not available.
- Block data cannot be transmitted.

3.3.3 Remote Control via RSIB Interface

To access the measuring instruments via the RSIB interface the DLLs should be installed in the corresponding directories:

`RSIB.DLL` in Windows NT `system` directory or control application directory.

`RSIB32.DLL` in Windows NT `system32` directory or control application directory.

The DLLs are already installed in the corresponding directories on the measuring instruments.
The control is performed via one of the Windows applications WinWord or Excel or with Visual C++ or Visual Basic programs. The local link to the internal controller is established with the name '@local'. If a remote controller is used, the instrument IP address is to be indicated here.

Via VisualBasic: internal controller: ud = RSDLLibfind ('@local', ibsta, iberr, ibcntl)
remote controller: ud = RSDLLibfind ('82.1.1.200', ibsta, iberr, ibcntl)

3.3.3.1 Indications during Remote Control

See Section 3.3.1.2.

3.3.3.2 Return to Manual Operation

The return to manual operation can be performed via the front panel (*LOCAL* key) or the RSIB interface.

Manually: Press the *LOCAL* key.

Note: *Before switchover, command processing must be completed as otherwise switchover to remote control is effected immediately.*

Via RSIB:

```
...
ud = RSDLLibloc (ud, ibsta, iberr, ibcntl);
...
```

3.4 IEC-Bus Messages

The messages transferred via the data lines of the IEC bus or the RSIB interface (see annex A) can be divided into two groups:

– **interface messages and**
– **device messages.**

For the RS-232 interface, no interface messages are defined.

3.4.1 IEE/IEEE-Bus Interface Messages

Interface messages are transferred on the data lines of the IEC bus, the "ATN" control line being active. They are used for communication between controller and instrument and can only be sent by a controller which has the IEC-bus control. Interface commands can be subdivided into

– **universal commands and**
– **addressed commands.**

Universal commands act on all devices connected to the IEC bus without previous addressing, addressed commands only act on devices previously addressed as listeners. The interface messages relevant to the instrument are listed in annex A.

3.4.2 RSIB Interface Messages

The RSIB interface enables the instrument to be controlled by Windows applications. The interface functions are matched to the function interface for IEC/IEEE-bus programming from National Instruments.
The functions supported by interface are listed in annex A.

3.4.3 Device Messages (Commands and Device Responses)

Device messages are transferred on the data lines of the IEC bus, the "ATN" control line not being active. ASCII code is used. The device messages are more or less equal for the different interfaces.
A distinction is made according to the direction in which they are sent on the IEC bus:

– **Commands** are messages the controller sends to the instrument. They operate the device functions and request informations.
The commands are subdivided according to two criteria::

1. According to the effect they have on the instrument:

   Setting commands cause instrument settings such as reset of the instrument or setting the center frequency.

   Queries cause data to be provided for output on the IEC-bus, e.g. for identification of the device or polling the marker.

2. According to their definition in standard IEEE 488.2:

   Common Commands are exactly defined as to their function and notation in standard IEEE 488.2. They refer to functions such as management of the standar-dized status registers, reset and selftest.

   Device-specific commands refer to functions depending on the features of the instrument such as frequency setting. A majority of these commands has also been standardized by the SCPI committee (cf. Section 3.5.1).

– **Device responses** are messages the instrument sends to the controller after a query. They can contain measurement results, instrument settings and information on the instrument status (cf. Section 3.5.4).

Structure and syntax of the device messages are described in Section 3.5. The commands are listed and explained in detail in Section 3.6.

3.5 Structure and Syntax of the Device Messages

3.5.1 SCPI Introduction

SCPI (Standard Commands for Programmable Instruments) describes a standard command set for programming instruments, irrespective of the type of instrument or manufacturer. The goal of the SCPI consortium is to standardize the device-specific commands to a large extent. For this purpose, a model was developed which defines the same functions inside a device or for different devices. Command systems were generated which are assigned to these functions. Thus it is possible to address the same functions with identical commands. The command systems are of a hierarchical structure.
Fig. 3.5-1 illustrates this tree structure using a section of command system SOURce, which operates the signal sources of the devices. The other examples concerning syntax and structure of the commands are derived from this command system.
SCPI is based on standard IEEE 488.2, i.e. it uses the same syntactic basic elements as well as the common commands defined in this standard. Part of the syntax of the device responses is defined with greater restrictions than in standard IEEE 488.2 (see Section "Responses to Queries").

3.5.2 Structure of a Command

The commands consist of a so-called header and, in most cases, one or more parameters. Header and parameter are separated by a "white space" (ASCII code 0 to 9, 11 to 32 decimal, e.g. blank). The headers may consist of several key words. Queries are formed by directly appending a question mark to the header.

Note: *The commands used in the following examples are not in every case implemented in the instrument.*

Common commands Common commands consist of a header preceded by an asterisk "*" and one or several parameters, if any.

Examples:	`*RST`	RESET, resets the device
	`*ESE 253`	EVENT STATUS ENABLE, sets the bits of the event status enable register
	`*ESR?`	EVENT STATUS QUERY, queries the contents of the event status register.

Device-specific commands

Hierarchy**:** Device-specific commands are of hierarchical structure (see Fig. 3.5-1). The different levels are represented by combined headers. Headers of the highest level (root level) have only one key word. This key word denotes a complete command system.

Example: `SENSe` This key word denotes the command system `SENSe`.

For commands of lower levels, the complete path has to be specified, starting on the left with the highest level, the individual key words being separated by a colon ":".

Example: `SENSe:FREQuency:SPAN:LINK STARt`

This command lies in the fourth level of the SENSe system. It determines which parameter remains unchanged when the span is changed. If LINK is set to STARt, the values of CENTer and STOP are adjusted when the span is changed.

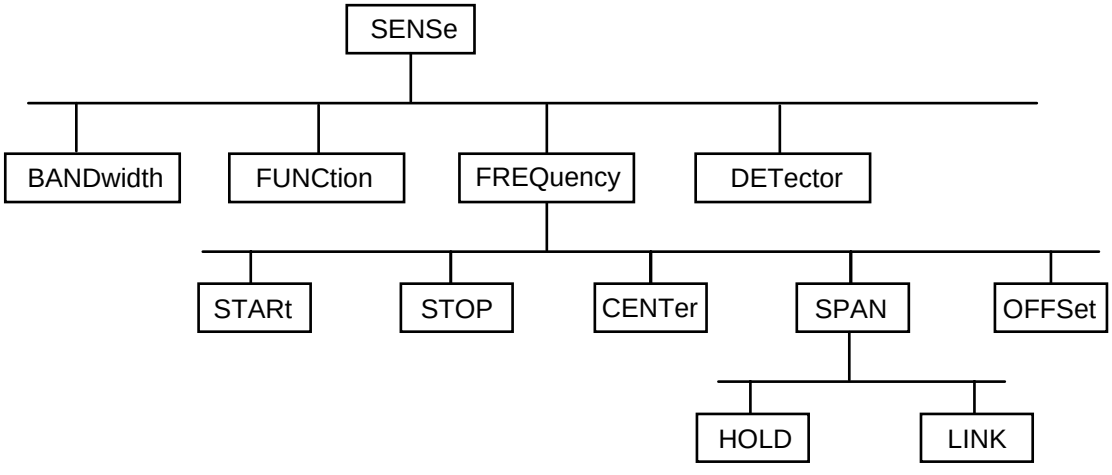


Fig. 3.5-1 Tree structure the SCPI command systems using the SENSe system by way of example

Some key words occur in several levels within one command system. Their effect depends on the structure of the command, that is to say, at which position in the header of a command they are inserted.

Example: `SOURce:FM:POLarity NORMal`
This command contains key word POLarity in the third command level. It defines the polarity between modulator and modulation signal.

`SOURce:FM:EXTernal:POLarity NORMal`
This command contains key word POLarity in the fourth command level. It defines the polarity between modulation voltage and the resulting direction of the modulation only for the external signal source indicated.

Optional key words: Some command systems permit certain key words to be optionally inserted into the header or omitted. These key words are marked by square brackets in the description. The full command length must be recognized by the instrument for reasons of compatibility with the SCPI standard. Some commands are considerably shortened by these optional key words.

Example: `[SENSe]:BANDwidth[:RESolution]:AUTO`
This command couples the resolution bandwidth of the instrument to other parameters. The following command has the same effect:
`BANDwidth:AUTO`

Note: *An optional key word must not be omitted if its effect is specified in detail by a numeric suffix.*

Long and short form: The key words feature a long form and a short form. Either the short form or the long form can be entered, other abbreviations are not permissible.

Beispiel: `STATus:QUEStionable:ENABle 1= STAT:QUES:ENAB 1`

Note: *The short form is marked by upper-case letters, the long form corresponds to the complete word. Upper-case and lower-case notation only serve the above purpose, the instrument itself does not make any difference between upper-case and lower-case letters.*

Parameter: The parameter must be separated from the header by a "white space". If several parameters are specified in a command, they are separated by a comma ",". A few queries permit the parameters MINimum, MAXimum and DEFault to be entered. For a description of the types of parameter, refer to Section 3.5.5.

Example: `SENSe:FREQuency:STOP? MAXimum` Response: 3.5E9
This query requests the maximal value for the stop frequency.

Numeric suffix: If a device features several functions or features of the same kind, e.g. inputs, the desired function can be selected by a suffix added to the command. Entries without suffix are interpreted like entries with the suffix 1.

Example:. `SYSTem:COMMunicate:SERial2:BAUD 9600`
This command sets the baudrate of the second serial interface.

3.5.3 Structure of a Command Line

A command line may consist of one or several commands. It is terminated by a <New Line>, a <New Line> with EOI or an EOI together with the last data byte. Quick BASIC automatically produces an EOI together with the last data byte.

Several commands in a command line are separated by a semicolon ";". If the next command belongs to a different command system, the semicolon is followed by a colon.

Example:
```
CALL IBWRT(receiver, "SENSe:FREQuency:CENTer 100MHz;:INPut:ATTenuation 10")
```

This command line contains two commands. The first command is part of the SENSe system and is used to specify the center frequency of the analyzer. The second command is part of the INPut system and sets the attenuation of the input signal.

If the successive commands belong to the same system, having one or several levels in common, the command line can be abbreviated. To this end, the second command after the semicolon starts with the level that lies below the common levels (see also Fig. 3.5-1). The colon following the semicolon must be omitted in this case.

Example:
```
CALL IBWRT(receiver, "SENSe:FREQuency:STARt 1E6;:SENSe:FREQuency:STOP 1E9")
```

This command line is represented in its full length and contains two commands separated from each other by the semicolon. Both commands are part of the SENSe command system, subsystem FREQuency, i.e. they have two common levels.
When abbreviating the command line, the second command begins with the level below SENSe:FREQuency. The colon after the semicolon is omitted.

The abbreviated form of the command line reads as follows:

```
CALL IBWRT(receiver,  "SENSe:FREQuency:STARt 1E6;STOP 1E9")
```

However, a new command line always begins with the complete path.

Example:
```
CALL IBWRT(receiver,  "SENSe:FREQuency:STARt 1E6")
CALL IBWRT(receiver,  "SENSe:FREQuency:STOP 1E9")
```

3.5.4 Responses to Queries

A query is defined for each setting command unless explicitly specified otherwise. It is formed by adding a question mark to the associated setting command. According to SCPI, the responses to queries are partly subject to stricter rules than in standard IEEE 488.2.

1 The requested parameter is transmitted without header.
Example: `INPut:COUPling?` Response: `DC`

2. Maximum values, minimum values and all further quantities, which are requested via a special text parameter are returned as numerical values.
Example: `SENSe:FREQuency:STOP? MAX` Response: `3.5E9`

3. Numerical values are output without a unit. Physical quantities are referred to the basic units or to the units set using the Unit command.
Example: `SENSe:FREQuency:CENTer?` Response: `1E6` for 1 MHz

4. Truth values <Boolean values> are returned as 0 (for OFF) and 1 (for ON).
Example: `SENSe:BANDwidth:AUTO?` Response: `1` for ON

5. Text (character data) is returned in a short form (see also Section 3.5.5).
Example: `SYSTem:COMMunicate:SERial:CONTrol:RTS?` Response(for standard): `STAN`

3.5.5 Parameters

Most commands require a parameter to be specified. The parameters must be separated from the header by a "white space". Permissible parameters are numerical values, Boolean parameters, text, character strings and block data. The type of parameter required for the respective command and the permissible range of values are specified in the command description (see Section 3.6).

Numerical values Numerical values can be entered in any form, i.e. with sign, decimal point and exponent. Values exceeding the resolution of the instrument are rounded up or down. The mantissa may comprise up to 255 characters, the exponent must lie inside the value range -32000 to 32000. The exponent is introduced by an "E" or "e". Entry of the exponent alone is not permissible. In the case of physical quantities, the unit can be entered. Permissible unit prefixes are G (giga), MA (mega), MOHM and MHZ are also permissible), K (kilo), M (milli), U (micro) and N (nano). It the unit is missing, the basic unit is used.

Example:
`SENSe:FREQuency:STOP 1.5GHz = SENSe:FREQuency:STOP 1.5E9`

Special numerical The texts MINimum, MAXimum, DEFault, UP and DOWN are interpreted as valuesspecial numerical values.

In the case of a query, the numerical value is provided.

Example: Setting command: `SENSe:FREQuency:STOP MAXimum`
Query: `SENSe:FREQuency:STOP?` Response: `3.5E9`

MIN/MAX MINimum and MAXimum denote the minimum and maximum value.

DEF DEFault denotes a preset value which has been stored in the EPROM. This value conforms to the default setting, as it is called by the *RST command

UP/DOWN UP, DOWN increases or reduces the numerical value by one step. The step width can be specified via an allocated step command (see annex C, List of Commands) for each parameter which can be set via UP, DOWN.

INF/NINF INFinity, Negative INFinity (NINF) Negative INFinity (NINF) represent the numerical values -9.9E37 or 9.9E37, respectively. INF and NINF are only sent as device reponses.

NAN Not A Number (NAN) represents the value 9.91E37. NAN is only sent as device response. This value is not defined. Possible causes are the division of zero by zero, the subtraction of infinite from infinite and the representation of missing values.

Boolean Parameters Boolean parameters represent two states. The ON state (logically true) is represented by ON or a numerical value unequal to 0. The OFF state (logically untrue) is represented by OFF or the numerical value 0. 0 or 1 is provided in a query.

Example: Setting command: `DISPlay:WINDow:STATe ON`
Query: `DISPlay:WINDow:STATe?` Response: `1`

Text

Text parameters observe the syntactic rules for key words, i.e. they can be entered using a short or long form. Like any parameter, they have to be separated from the header by a white space. In the case of a query, the short form of the text is provided.

Example: Setting command: `INPut:COUPling GROund`
Query: `INPut:COUPling?` Response `GRO`

Strings

Strings must always be entered in quotation marks (' or ").

Example: `SYSTem:LANGuage "SCPI"` or
`SYSTem:LANGuage 'SCPI'`

Block data

Block data are a transmission format which is suitable for the transmission of large amounts of data. A command using a block data parameter has the following structure:

Example: `HEADer:HEADer #45168xxxxxxxx`

ASCII character # introduces the data block. The next number indicates how many of the following digits describe the length of the data block. In the example the 4 following digits indicate the length to be 5168 bytes. The data bytes follow. During the transmission of these data bytes all End or other control signs are ignored until all bytes are transmitted..

3.5.6 Overview of Syntax Elements

The following survey offers an overview of the syntax elements.

:	The colon separates the key words of a command. In a command line the colon after the separating semicolon marks the uppermost command level.
;	The semicolon separates two commands of a command line. It does not alter the path.
,	The comma separates several parameters of a command.
?	The question mark forms a query.
*****	The asterix marks a common command.
"	Quotation marks introduce a string and terminate it.
#	The double dagger (#) introduces block data
	A "white space (ASCII-Code 0 to 9, 11 to 32 decimal, e.g.blank) separates header and parameter.

3.6 Description of Commands

3.6.1 Notation

In the following sections, all commands implemented in the instrument are first listed in tables and then described in detail, separated according to the command system. The notation corresponds to the one of the SCPI standards to a large extent. The SCPI conformity information can be taken from the individual description of the commands.

Table of Commands

Command: In the command column, the table provides an overview of the commands and their hierarchical arrangement (see indentations).

Parameter: The parameter column indicates the requested parameters together with their specified range.

Unit: The unit column indicates the basic unit of the physical parameters.

Remark: In the remark column an indication is made on:
- whether the command does not have a query form,
- whether the command has only one query form
- whether this command is implemented only with a certain option of the instrument

Indentations

The different levels of the SCPI command hierarchy are represented in the table by means of indentations to the right. The lower the level is, the farther the indentation to the right is. Please observe that the complete notation of the command always includes the higher levels as well.

Example: `SENSe:FREQuency:CENTer` is represented in the table as follows:

`SENSe`	first level
`:FREQuency`	second level
`:CENTer`	third level

Individual description

In the individual description, the complete notation of the command is given. An example for each command, the *RST value and the SCPI information is written out at the end of the individual description.
The modes for which a command can be used are indicated by the following abbreviations:

E	Receiver
A	Spectrum analysis
A-F	Spectrum analysis - frequency domain only
A-Z	Spectrum analysis - time domain only (zero span)
VA	Vector signal analysis (option FSE-B7)
VA-D	Vector signal analysis - digital demodulation only (option FSE-B7)
VA-A	Vector signal analysis - analog demodulation (option FSE-B7)

Note: *The receiver and spectrum analysis modes are implemented in the basic unit. For the other modes, the corresponding options are required.*

Upper/lower case notation Upper/lower case letters serve to mark the long or short form of the key words of a command in the description (see Section 3.5.2). The instrument itself does not distinguish between upper and lower case letters.

Special characters | A selection of key words with an identical effect exists for several commands. These key words are indicated in the same line, they are separated by a vertical stroke. Only one of these key words has to be indicated in the header of the command. The effect of the command is independent of which of the key words is indicated.

Example: `SENSe:FREQuency:CW|:FIXed`

The two following commands of identical meaning can be formed. They set the frequency of the constantly frequent signal to 1 kHz:

`SENSe:FREQuency:CW 1E3` = `SENSe:FREQuency:FIXed 1E3`

A vertical stroke in indicating the parameters marks alternative possibilities in the sense of "or". The effect of the command is different, depending on which parameter is entered.

Example: Selection of the parameters for the command

`INPut:COUPling AC | DC`

If parameter AC is selected, only the AC content is fed through, in the case of DC, the DC as well as the AC content.

[ ] Key words in square brackets can be omitted when composing the header (cf. Section 3.5.2, Optional Keywords). The full command length must be accepted by the instrument for reasons of compatibility with the SCPI standards.
Parameters in square brackets can optionally be incorporated in the command or omitted as well.

{ } Parameters in braces can optionally be incorporated in the command either not at all, once or several times.

Description of parameters Due to the standardization, the parameter section of SCPI commands consists always of the same syntactical elements. SCPI has specified a series of definitions therefore, which are used in the tables of commands. In the tables, these established definitions are indicated in angled brackets (<...>) and will be briefly explained in the following (see also Section 3.5.5, "Parameters").

<Boolean> This indication refers to parameters which can adopt two states, "on" and "off". The "off" state may either be indicated by the keyword **OFF** or by the numeric value 0, the "on" state is indicated by **ON** or any numeric value other than zero. Parameter queries are always returned the numeric value 0 or 1.

<numeric_value>

<num> These indications mark parameters which may be entered as numeric values or be set using specific keywords (character data).

The keywords given below are permitted:

MINimum This keyword sets the parameter to the smallest possible value.

MAXimum This keyword sets the parameter to the largest possible value.

DEFault This keyword is used to reset the parameter to its default value.

UP This keyword increments the parameter value.

DOWN This keyword decrements the parameter.

The numeric values associated to MAXimum/MINimum/DEFault can be queried by adding the corresponding keywords to the command. They must be entered following the quotation mark.

Example: `SENSe:FREQuency:CENTer? MAXimum`

returns the maximum possible numeric value of the center frequency as result.

<arbitrary block program data>

This keyword is provided for commands the parameters of which consist of a binary data block.

3.6.2 Common Commands

The common commands are taken from the IEEE 488.2 (IEC 625-2) standard. Same commands have the same effect on different devices. The headers of these commands consist of an asterisk "*" followed by three letters. Many common commands refer to the status reporting system which is described in detail in Section 3.8.

Command	Designation	Parameter	Remark
*CAL?	Calibration Query		query only
*CLS	Clear Status		no query
*ESE	Event Status Enable	0 to 255	
*ESR?	Standard Event Status Query	0 to 255	query only
*IDN?	Identification Query	<string>	query only
*IST?	Individual Status Query	0 to 255	query only
*OPC	Operation Complete		
*OPT?	Option Identification Query		query only
*PCB	Pass Control Back	0 to 30	no query
*PRE	Parallel Poll Register Enable	0 to 255	
*PSC	Power On Status Clear	0 | 1	
*RST	Reset		no query
*SRE	Service Request Enable	0 to 255	
*STB?	Status Byte Query		query only
*TRG	Trigger		no query
*TST?	Self Test Query		query only
*WAI	Wait to continue		no query

***CAL?**

CALIBRATION QUERY triggers a calibration of the instrument and subsequently query the calibration status. Any responses > 0 indicate errors.

***CLS**

CLEAR STATUS sets the status byte (STB), the standard event register (ESR) and the EVENt-part of the QUEStionable and the OPERation register to zero. The command does not alter the mask and transition parts of the registers. It clears the output buffer.

***ESE 0 to 255**

EVENT STATUS ENABLE sets the event status enable register to the value indicated. Query *ESE? returns the contents of the event status enable register in decimal form.

***ESR?**

STANDARD EVENT STATUS QUERY returns the contents of the event status register in decimal form (0 to 255) and subsequently sets the register to zero.

***IDN?**

IDENTIFICATION QUERY queries the instrument identification.

The instrument identification consists of the following elements which are separated by commas:

Manufacturer
Device (receiver model)
Serial number of the instrument
Firmware version number
Example: "Rohde&Schwarz, ESI7, 825082/007, 2.01"

***IST?**

INDIVIDUAL STATUS QUERY returns the contents of the IST flag in decimal form (0 | 1). The IST flag is the status bit which is sent during a parallel poll (cf. Section 3.8.3.2).

***OPC**

OPERATION COMPLETE sets bit 0 in the event status register when all preceding commands have been executed. This bit can be used to initiate a service request (cf. Section 3.7).

***OPC?**

OPERATION COMPLETE QUERY writes message "1" into the output buffer as soon as all preceding commands have been executed (cf. Section 3.7).

***OPT?**

OPTION IDENTIFICATION QUERY queries the options included in the instrument and returns a list of the options installed. The options are separated from each other by means of commas.

Position	Option	
1	FSE-B3	TV Demodulator
2	FSE-B4	Low Phase Noise & OCXO
3	FSE-B5	FFT-Filter
4		reserved
5	FSE-B7	Vector Signal Analysis
6		reserved
7		reserved
8	FSE-B10	Tracking Generator 7 GHz
9	FSE-B11	Tracking Generator 7 GHz with I/Q modulator
10	FSE-B12	Output Attenuator for Tracking Generator
11		reserved
12		reserved
13		reserved
14		reserved
15		reserved
16		reserved
17		reserved
18		reserved
19	FSE-B21	External Mixer Output
20		reserved
21		reserved

Example: 0, FSE-B4, FSE-B5, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

Note: *The standard ESI is equipped with options FSE-B4 and FSE-B6.*

***PCB 0 to 30**

PASS CONTROL BACK indicates the controller address which the IEC-bus control is to be returned to after termination of the triggered action.

***PRE 0 to 255**

PARALLEL POLL REGISTER ENABLE sets parallel poll enable register to the value indicated. Query *PRE? returns the contents of the parallel poll enable register in decimal form.

***PSC 0 | 1**

POWER ON STATUS CLEAR determines whether the contents of the ENABle registers is maintained or reset in switching on.

*PSC = 0 causes the contents of the status registers to be maintained. Thus a service request can be triggered in switching on in the case of a corresponding configuration of status registers ESE and SRE.

*PSC ≠ 0 resets the registers.

Query *PSC? reads out the contents of the power-on-status-clear flag. The response can be 0 or 1.

***RST**

RESET sets the instrument to a defined default status. The command essentially corresponds to pressing the [PRESET] key. The default setting is indicated in the description of the commands.

***SRE 0 to 255**

SERVICE REQUEST ENABLE sets the service request enable register to the value indicated. Bit 6 (MSS mask bit) remains 0. This command determines under which conditions a service request is triggered. Query *SRE? reads the contents of the service request enable register in decimal form. Bit 6 is always 0.

***STB?**

READ STATUS BYTE QUERY reads out the contents of the status byte in decimal form.

***TRG**

TRIGGER triggers a measurement. This command corresponds to `INITiate:IMMediate` (cf. Section "TRIGger subsystem", as well).

***TST?**

SELF TEST QUERY triggers all selftests of the instrument and outputs an error code in decimal form.

***WAI**

WAIT-to-CONTINUE only permits the servicing of the subsequent commands after all preceding commands have been executed and all signals have settled (cf. Section 3.7 and "*OPC" as well).

3.6.3 ABORt Subsystem

The ABORt subsystem contains the commands for aborting triggered actions. An action can be triggered again immediately after being aborted. All commands trigger events which is why they are not assigned any *RST value.

COMMAND	PARAMETERS	UNIT	COMMENT
ABORt	--	--	no query
HOLD	--	--	no query

ABORt

This command aborts a current measurement and resets the trigger system.

Example: "ABOR;INIT:IMM"

Features: ***RST value:** 0
SCPI: conforming

Modes: E, A, VA

HOLD

This command interrupts a current scan measurement.

Example: "HOLD"

Features: ***RST value:** -
SCPI: conforming

Modes: E

3.6.4 CALCulate Subsystem

The CALCulate subsystem contains commands for converting instrument data, transforming and carrying out corrections. These functions are carried out subsequent to data acquistion, i.e., following the SENSe subsystem.

In the split-screen representation, a distinction is made between CALCulate1 and CALCulate2:

CALCulate1 ≙ screen A;

CALCulate2 ≙ screen B

3.6.4.1 CALCulate:DELTamarker Subsystem

The CALCulate:DELTamarker subsystem checks the delta-marker functions in the instrument.

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:DELTamarker<1 to 4>			
[:STATe]	<Boolean>	--	
:MODE	ABSolute|RELative		
:AOFF			no query
:TRACe	<numeric_value>	--	
:X	<numeric_value>	HZ | S | SYM	
:RELative?	--	--	query only
:Y?	--	--	query only
:MAXimum			
[:PEAK]	--	--	no query
:APEak	--	--	no query (option vector analysis)
:NEXT	--	--	no query
:RIGHt	--	--	no query
:LEFT	--	--	no query
:MINimum			
[:PEAK]	--	--	no query
:NEXT	--	--	no query
:RIGHt	--	--	no query
:LEFT	--	--	no query
:FUNCtion			
:FIXed			
[:STATe]	<Boolean>		
:RPOint			
:Y	<numeric_value>	DBM	
:OFFSet	<numeric_value>	DB	
:X	<numeric_value>	HZ |S | SYM	
:PNOise			
[:STATe]	<Boolean>		
:RESult?	--	--	query only
:STEP			
[:INCRement]	<numeric_value>	HZ |S | SYM	
:AUTO	<Boolean>	--	

CALCulate<1|2>:DELTamarker<1 to 4>[:STATe] ON | OFF

This command switches on or off the selected delta marker. If no indication is made, delta marker 1 is selected automatically.

Example: "CALC:DELT3 ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:DELTamarker<1 to 4>:MODE ABSolute | RELative

This command switches over between relative and absolute input of frequency of the delta marker.

Example: "CALC:DELT:MODE ABS"

Features: *RST value: REL
SCPI: device-specific

Modes: E, A, VA

In the RELative mode, the frequency of the delta marker is programmed relative to the reference marker. In the ABSolute mode, the frequency is defined by the absolute values.

CALCulate<1|2>:DELTamarker<1 to 4>:AOFF

This command switches off all active delta markers.

Example: "CALC:DELT:AOFF"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:DELTamarker<1 to 4>:TRACe 1 to 4

This command assigns the selected delta marker to the indicated measuring curve.

Example: "CALC:DELT3:TRAC 2"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:DELTamarker<1...4>:X 0 ... MAX (frequency | sweep time | symbols)

This command positions the selected delta marker to the indicated frequency (span > 0) or time (span = 0). The query always returns the absolute value of frequency or time.

Example: "CALC:DELT:X 10.7MHz"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

The SYM unit is only valid in Vector Signal Analysis mode.

CALCulate<1|2>:DELTamarker<1 to 4>:X:RELative?

This command queries the frequency (span > 0) or time (span = 0) of the selected delta marker relative to the reference marker.

Example: "CALC:DELT:X:REL?"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:DELTamarker<1 to 4>:Y?

This command queries the value of the selected marker.

Example: "CALC:DELT:Y?"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:DELTamarker<1 to 4>:MAXimum[:PEAK]

This command positions the delta marker to the current maximum value in the trace memory.

Example: "CALC:DELT:MAX"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:MAXimum:APEak

This command positions the delta marker to the maximum absolute value of the trace.

Example: "CALC:DELT:MAX:APE"

Features: *RST value: -
SCPI: device-specific

Modes: VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:MAXimum:NEXT

This command positions the delta marker to the next smaller maximum value in the trace memory.

Example: "CALC:DELT:MAX:NEXT"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:MAXimum:RIGHt

This command positions the delta marker to the next smaller maximum value to the right of the current value (i.e., in ascending X direction) in the trace memory.

Example: "CALC:DELT:MAX:RIGH"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:MAXimum:LEFT

This command positions the delta marker to the next smaller maximum value to the left of the current value (i.e., in descending X direction) in the trace memory.

Example: "CALC:DELT:MAX:LEFT"

Features: *RST value: -
SCPI: device-specific

Modes: A, BTS, MS

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:MINimum[:PEAK]

This command positions the delta marker to the current minimum value in the trace memory.

Example: "CALC:DELT:MIN"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:MINimum:NEXT

This command positions the delta marker to the next higher minimum value in the trace memory.

Example: "CALC:DELT:MIN:NEXT"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:MINimum:RIGHt

This command positions the delta marker to the next higher minimum value to the right of the current value (ie in ascending X direction).

Example: "CALC:DELT:MIN:RIGH"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:MINimum:LEFT

This command positions the delta marker to the next higher minimum value to the left of the current value (ie in descending X direction).

Example: "CALC:DELT:MIN:LEFT"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:DELTamarker<1 to 4>:FUNCtion:FIXed[:STATe] ON | OFF

This command switches the relative measurement to a fixed reference value on or off.

Example: "CALC:DELT:FUNC:FIX ON"

Features: *RST value: OFF
SCPI: device-specific.

Modes: E, A, VA-D

The reference value is independent of the current trace.

CALCulate<1|2>:DELTamarker<1 to 4>:FUNCtion:FIXed:RPOint:Y <numeric_value>

This command defines a new fixed reference value for the relative measurement.

Example: "CALC:DELT:FUNC:FIX:RPO:Y -10dBm"

Features: *RST value: - (FUNction:FIXed[:STATe] is set to OFF)
SCPI: device-specific

Modes: A, VA

The reference value is independent of the current trace.

CALCulate<1|2>:DELTamarker<1 to 4>:FUNCtion:FIXed:RPOint:Y:OFFSet <numeric_value>

This command defines an additional level offset for the relative measurement.

Example: "CALC:DELT:FUNC:FIX:RPO:Y:OFFS 10dB"

Features: *RST value: 0 dB
SCPI: device-specific

Modes: A, VA

The level offset is included in the output of the level value.

CALCulate<1|2>:DELTamarker<1 to 4>:FUNCtion:FIXed:RPOint:X <numeric_value>

This command defines the new fixed reference frequency, time or symbols for the relative measurement.

Example: "CALC:DELT:FUNC:FIX:RPO:X 10.7MHz"

Features: *RST value: - (FUNction:FIXed[:STATe] is set to OFF)
SCPI: device-specific

Mode: A

The reference value is independent of the current trace. With span = 0, the reference time, otherwise the reference frequency is defined.

CALCulate<1|2>:DELTamarker<1 to 4>:FUNCtion:PNOise[:STATe] ON | OFF

This command switches the measurement of the phase noise on or off.

Example: "CALC:DELT:FUNC:PNO ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

When the phase noise is measured, the correction values for the bandwidth and the log amplifier are automatically considered. The measurement uses the reference values defined by FUNCtion:FIXed:RPOint:X or :Y.

CALCulate<1|2>:DELTamarker<1 to 4>:FUNCtion:PNOise:RESult?

This command queries the result of the phase noise measurement.

Example: "CALC:DELT:FUNC:PNO:RES?"

Features: *RST value: -
SCPI: device-specific

Mode: A

This command is only a query which is why it is not assigned an *RST value.

CALCulate<1|2>:DELTamarker<1 to 4>:STEP[:INCRement] <numeric_value>

This command defines the delta marker step width.

Example: "CALC:DELT:STEP 10kHz" (frequency domain)
"CALC:DELT:STEP 5ms" (time domain)

Features: *RST value: - (STEP is set to AUTO)
SCPI: device-specific

Mode: A

CALCulate<1|2>:DELTamarker<1 to 4>:STEP:AUTO ON | OFF

This command switches the automatic adaptation of the marker step width on or off.

Example: "CALC:DELT:STEP:AUTO OFF"

Features: *RST value: ON
SCPI: device-specific

Mode: A

With AUTO ON, the step width is 10% of the span.

3.6.4.2 CALCulate:DLINe Subsystem

The CALCulate:DLINe subsystem checks the display lines in the instrument, i.e., the level, frequency and time lines (depending on the X-axis) as well as threshold and reference lines.

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:DLINe<1|2>	<numeric_value>	DBM | DB | DEG | RAD | S | HZ | PCT	
:STATe	<Boolean>		
:THReshold	<numeric_value>	DBM | DB | DEG | RAD | S | HZ | PCT	
:STATe	<Boolean>		
:RLINe	<numeric_value>	DBM | DB | DEG | RAD | S | HZ | PCT	
:STATe	<Boolean>		
:FLINe<1|2>	<numeric_value>	HZ	
:STATe	<Boolean>		
:TLINe<1|2>	<numeric_value>	S | SYM	
:STATe	<Boolean>		

CALCulate<1|2>:DLINe<1|2> MINimum to MAXimum (depending on current unit)

This command defines the position of the display line.

Example: "CALC:DLIN -20dBm"

Features: *RST value: - (STATe to OFF)
SCPI: device-specific

Modes: E, A, VA

The display lines mark the given level in the display.

The units DEG, RAD, S, HZ, and PCT are only valid in conjunction with option Vector Signal Analysis, FSE-B7.

CALCulate<1|2>:DLINe<1|2>:STATe ON | OFF

This command switches the display line on or off.

Example: "CALC:DLIN2:STAT OFF"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:THReshold MINimum to MAXimum (depending on current unit)

This command defines the position of the thresholds.

Example: "CALC:THR -82dBm"

Features: *RST value: - (STATe to OFF)
SCPI: device-specific

Modes: E, A, VA

For marker scan functions MAX PEAK, NEXT PEAK etc., the threshold serves as the lowest limit for maximum or minimum search.

CALCulate<1|2>:THReshold:STATe ON | OFF

This command switches the threshold on or off.

Example: "CALC:THR:STAT ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:RLINe MINimum to MAXimum (depending on the current unit)

This command defines the position of the reference line.

Example: "CALC:RLIN -10dBm"

Features: *RST value: - (STATe to OFF)
SCPI: device-specific

Modes: E, A, VA

The reference line serves as a reference for the arithmetic operation of traces.

CALCulate<1|2>:RLINe:STATe ON | OFF

This command switches the reference line on or off.

Example: "CALC:RLIN:STAT ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:FLINe<1|2> 0 GHz to f_{max}

This command defines the position of the frequency lines.

Example: "CALC:FLIN2 120MHz"

Features: *RST value: - (STATe to OFF)
SCPI: device-specific

Modes: E, A-F, VA

The frequency lines mark the given frequencies in the display. Frequency lines are only valid for a SPAN >0.

CALCulate<1|2>:FLINe<1|2>:STATe ON | OFF

This command switches the frequency line on or off.

Example: "CALC:FLIN2:STAT ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A-F, VA

CALCulate<1|2>:TLINe<1|2> 0 to 1000s

This command defines the position of the time lines.

Example: "CALC:TLIN 10ms"

Features: *RST value: - (STATe to OFF)
SCPI: device-specific

Modes: A-Z, VA

The time lines mark the given times in the display. Time lines are only valid for a SPAN = 0.

CALCulate<1|2>:TLINe<1|2>:STATe ON | OFF

This command switches the time line on or off.

Example: "CALC:TLIN2:STAT ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: A-Z, VA

3.6.4.3 CALCulate:FEED Subsystem

The CALCulate:FEED subsystem selects the measured data in operating mode vector signal analysis. This sub system is only valid in connection with option FSE-B7, Vector Signal Analysis.

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:FEED	<string>		Vector Signal Analysis no query

CALCulate<1|2>:FEED <string>

This command selects the measured data that are to be displayed.

Parameter: <string>::= 'XTIM:DDEM:MEAS' |
'XTIM:DDEM:REF' |
'XTIM:DDEM:ERR:MPH' |
'XTIM:DDEM:ERR:VECT' |
'XTIM:DDEM:SYMB' |
'XTIM:AM' |
'XTIM:FM' |
'XTIM:PM' |
'XTIM:AMSummary' |
'XTIM:FMSummary' |
'XTIM:PMSummary' |

Example: "CALC:FEED 'XTIM:DDEM:SYMB'"

Features: *RST value: 'XTIM:DDEM:MEAS'
SCPI: conforming

Mode: VA

The string parameters have the following meaning:

'XTIM:DDEM:MEAS'	Test signal (filtered, synchronized to symbol clock)
'XTIM:DDEM:REF'	Reference signal (internally generated from demodulated test signal)
'XTIM:DDEM:ERR:MPH'	Error signal (magnitude and phase error)
'XTIM:DDEM:ERR:VECT'	Vector error signal
'XTIM:DDEM:SYMB'	Symbol table (demodulated bits and table with modulation errors)
'XTIM:AM'	Demodulated AM signal (analog demodulation)
'XTIM:FM'	Demodulated FM signal (analog demodulation)
'XTIM:PM'	Demodulated PM signal (analog demodulation)
'XTIM:AMSummary'	AM-Summary Marker (analog demodulation)
'XTIM:FMSummary'	FM-Summary Marker (analog demodulation)
'XTIM:PMSummary'	PM-Summary Marker (analog demodulation)

3.6.4.4 CALCulate:FORMat Subsystem

The CALCulate:FORMat subsystem determines further processing and conversion of measured data in operating mode vector signal analysis.
This sub system is only valid in connection with option FSE-B7, Vector Signal Analysis.

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:FORMat	MAGNitude | PHASe | UPHase | RIMag | FREQuency | IEYE | QEYE | TEYE | FEYE | COMP | CONS		Vector Signal Analysis
:FSK			
:DEViation			
:REFerence	<numeric_value>	HZ	Vector Signal Analysis

CALCulate<1|2>:FORMat MAGNitude | PHASe | UPHase | RIMag | FREQuency | IEYE | QEYE | TEYE | FEYE | COMP | CONS

This command defines the display of the traces.

Example: "CALC:FORM CONS"

Features: *RST value: MAGNitude
SCPI: conforming

Mode: VA-D

The parameters have the following meaning:

MAGNitude	Display of the magnitude in the time domain
PHASe | UPHase	Display of the phase in the time domain with or without (”unwrapped”) limitation to ±180°
RIMag	Display of the time characteristic of inphase and quadrature component
FREQuency	Display of the frequency response in the time domain
IEYE | QEYE	Eye diagram of the inphase or quadrature component
TEYE	Display of the trellis diagram
FEYE	Eye diagram of FSK modulation
COMP	Display of the polar vector diagram (complex)
CONS	Display of the polar vector diagaram (constellation)

CALCulate<1|2>:FSK:DEViation:REFerence <numeric_value>

This command defines the reference value of the frequency deviation for FSK modulation.

Example: "CALC:FSK:DEV:REF 20kHz"

Features: *RST value: -
SCPI: device-specific

Mode: VA-D

3.6.4.5 CALCulate:LIMit Subsystem

The CALCulate:LIMit subsystem comprises the limit lines and the corresponding limit checks. Limit lines can be defined as upper and lower limit lines. The individual values of the limit lines correspond to the values of the X-axis (CONTrol) which have to have the same number.

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate			
:LIMit<1 to 8>			
:TRACe	<numeric_value>		
:STATe	<Boolean>	--	
: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 | DEG | RAD | S | HZ | PCT | UNITLESS		
:CONTrol			
[:DATA]	<numeric_value>,<numeric_value>..	HZ | S | SYM	
:DOMain	FREQuency | TIME		
:OFFSet	<numeric_value>	HZ | S | SYM	
:MODE	RELative | ABSolute		
:UNIT			
[:TIME]	S | SYM		Vector Signal Analysis
:SHIFt	<numeric_value>	HZ | S | SYM	
:SPACing	LINear | LOGarithmic		
:UPPer			
[:DATA]	<numeric_value>,<numeric_value>..	DBM | DB | DEG | RAD | S | HZ | PCT	
:STATe	<Boolean>	--	
:OFFSet	<numeric_value>	DB | DEG | RAD | S | HZ | PCT	
:MARGin	<numeric_value>	DB| DEG | RAD | S | HZ | PCT	
:MODE	RELative | ABSolute	--	
:SHIFt	<numeric_value>	DB | DEG | RAD| S | HZ | PCT	
:SPACing	LINear | LOGarithmic		
:LOWer			
[:DATA]	<numeric_value>,<numeric_value>..	DBM | DB | DEG | RAD | S | HZ | PCT	
:STATe	<Boolean>	--	
:OFFSet	<numeric_value>	DB| DEG | RAD | S | HZ | PCT	
:MARGin	<numeric_value>	DB| DEG | RAD | S | HZ | PCT	
:MODE	RELative | ABSolute	--	
:SHIFt	<numeric_value>	DB | DEG | RAD | S | HZ | PCT	
:SPACing	LINear | LOGarithmic		
:FAIL?			query only
:CLEar		--	
[:IMMediate]	--	--	no query
:COMMent			
:COPY	<string>		
:NAME	1 to 8 | < name>		
:DELete	<string>		

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate			
:LIMit<1 to 8>			
:ACPower			
[:STATe]	<Boolean>		
:ACHannel	<numeric_value>, <numeric_value>	DB; DB	query only
:STATe	<Boolean>		
:RESult?	--		
:ALTernate<1|2>	<numeric_value>, <numeric_value>	DB; DB	query only
:STATe	<Boolean>		
:RESult?	--		

CALCulate<1|2>:LIMit<1 to 8>:TRACe <numeric_value>

This command assigns a trace to a limit line.

Example: "CALC:LIM2:TRAC 2"

Features: *RST value: 1
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:LIMit<1 to 8>:STATe ON | OFF

This command switches the limit check for the selected limit line on or off.

Example: "CALC:LIM:STAT ON"

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

In analyzer and vector analyzer mode, the result of the limit check can be queried with CALCulate:LIMit:FAIL?.

CALCulate<1|2>:LIMit<1...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|

This command defines the unit of the selected limit line.

Example: "CALC:LIM:UNIT DBUV"

Features: *RST value: DBM
SCPI: device-specific

Modes: E, A, VA

In receiver mode the units DBM, DBUV, DBUA, DBPW, DBPT, DBUV_M, and DBUA_M are available

In analyzer mode all units are available except for DBPT, DEG, RAD, S, HZ and PCT.

DBUV_MHZ and DBUA_MHZ denote the units DBUV/MHZ or DBUA/MHZ.
Upon selection of the unit DB the limit line is automatically switched to the relative mode. For units different from DB the limit line is automatically switched to the absolute mode.

The units DEG, RAD, S, HZ, PCT are available in the spectrum analysis mode only.

CALCulate<1|2>:LIMit<1 to 8>:CONTrol[:DATA] <numeric_value>,<numeric_value>..

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

Example: "CALC:LIM:CONT 1MHz,30MHz,300MHz,1GHz"

Features: *RST value: - (LIMit:STATe is set to OFF)
SCPI: conforming

Modes: E, A, VA

The number of values for the CONTrol axis and the corresponding UPPer- and/or LOWer limit lines have to be identical:

receiver	HZ
spectrum analysis	HZ | S
vector analysis	HZ | S | SYM.

CALCulate<1|2>:LIMit<1 to 8>:CONTrol:DOMain FREQuency | TIME

This command defines the X-axis in the frequency or time domain.

Example: "CALC:LIM:CONT:DOM TIME"

Features: *RST value: FREQuency
SCPI: device-specific

Modes: A, VA

CALCulate<1|2>:LIMit<1 to 8>:CONTrol:OFFSet <numeric_value>

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

Example: "CALC:LIM:CONT:OFFS 100us"

Features: *RST value: 0
SCPI: device-specific

Modes: A, VA

CALCulate<1|2>:LIMit<1 to 8>:CONTrol:MODE RELative | ABSolute

This command selects the relative or absolute scaling for the X-axis of the selected limit line.

Example: "CALC:LIM:CONT:MODE REL"

Features: *RST value: ABSolute
SCPI: device-specific

Modes: A, VA

Upon selection of RELative, the unit is switched to DB.

CALCulate<1|2>:LIMit<1 to 8>:CONTrol:UNIT[:TIME] S | SYM

This command defines the unit of the x-axis scaling of limit lines.

Example: "CALC:LIM:CONT:UNIT SYM"

Features: *RST value: S
SCPI: device-specific

Mode: VA

CALCulate<1|2>:LIMit<1 to 8>:CONTrol:SHIFt <numeric_value>

This command shifts a limit line which has been specified for relative frequencies or times (X-axis).

Example: "CALC:LIM:CONT:SHIF 50kHz"

Features: *RST value: --
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:LIMit<1 to 8>:CONTrol:SPACing LINear | LOGarithmic

This command makes a selection between linear and logarithmic interpolation for determining the limit line from the frequency points.

Example: "CALC:LIM:CONT:SPAC LIN"

Features: *RST value: LIN
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:LIMit<1 to 8>:UPPer[:DATA] <numeric_value>,<numeric_value>..

This command defines the values for the upper limit lines.

Example: "CALC:LIM:UPP -10,0,0,-10"

Features: *RST value: - (LIMit:STATe is set to OFF)
SCPI: conforming

Modes: E, A, VA

The number of values for the CONTrol axis and the corresponding UPPer limit line have to be identical.

If the measured values exceed the UPPer limit line in analyzer or vector analyzer mode, the limit check signals errors. The unit must be identical with the unit selected by CALC:LIM:UNIT.

The units DEG, RAD, S, HZ, PCT are available in the vector signal analysis mode only.

CALCulate<1|2>:LIMit<1 to 8>:UPPer:STATe ON | OFF

This command defines the selected limit line as upper limit line.

Example: "CALC:LIM:UPPer:STAT ON"

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

In analyzer and vector analyzer mode, the result of the limit check can be queried with CALCulate:LIMit<1 to 8>:FAIL?.

CALCulate<1|2>:LIMit<1 to 8>:UPPer:OFFSet <numeric_value>

This command defines an offset for the Y-axis of the selected relative upper limit line.

Example: "CALC:LIM:UPP:OFFS 3dB"

Features: *RST value: 0
SCPI: device-specific

Modes: A, VA

CALCulate<1|2>:LIMit<1 to 8>:UPPer:MARGin <numeric_value>

This command defines the margin of the selected upper limit line.

Example: "CALC:LIM:UPP:MARG 10dB"

Features: *RST value: 0
SCPI: device-specific

Modes: A, VA

CALCulate<1|2>:LIMit<1 to 8>:UPPer:MODE RELative | ABSolute

This command selects the relative or absolute scaling for the Y-axis of the selected upper limit line.

Example: "CALC:LIM:UPP:MODE REL"

Features: *RST value: ABSolute
SCPI: device-specific

Modes: A, VA

CALCulate<1|2>:LIMit<1 to 8>:UPPer:SHIFt <numeric_value>

This command shifts a limit line, which has relative values for the Y-axis (levels or linear units such as volt).

Example: "CALC:LIM:UPP:SHIF 20dB"

Features: *RST value: --
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:LIMit<1 to 8>:UPPer:SPACing LINear | LOGarithmic

This command makes a selection between linear and logarithmic interpolation for the upper limit line.

Example: "CALC:LIM:UPP:SPAC LIN"

Features: *RST value: LIN
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:LIMit<1 to 8>:LOWer[:DATA] <numeric_value>,<numeric_value>..

This command defines the values for the selected lower limit line.

Example: "CALC:LIM:LOW -30,-40,-40,-30"

Features: *RST value: - (LIMit:STATe is set to OFF)
SCPI: conforming

Modes: E, A, VA

The number of values for the CONTrol axis and the corresponding LOWer limit line have to be identical.If the measured values violate the LOWer limit line in analyzer or vector analyzer mode, the limit check signals errors. The unit must be identical with the unit selected by CALC:LIM:UNIT.

The units DEG, RAD, S, HZ, PCT are available in the vector signal analysis mode only.

CALCulate<1|2>:LIMit<1 to 8>:LOWer:STATe ON | OFF

This command defines the selected limit line as lower limit line.

Example: "CALC:LIM:LOWer:STAT ON"

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

In analyzer and vector analyzer mode, the result of the limit check can be queried with CALCulate:LIMit:FAIL?.

CALCulate<1|2>:LIMit<1 to 8>:LOWer:OFFSet <numeric_value>

This command defines an offset for the Y-axis of the selected relative lower limit line.

Example: "CALC:LIM:LOW:OFFS 3dB"

Features: *RST value: 0
SCPI: device-specific

Modes: A, VA

CALCulate<1|2>:LIMit<1 to 8>:LOWer:MARGin <numeric_value>

This command defines the margin of the selected lower limit line.

Example: "CALC:LIM:LOW:MARG 10dB"

Features: *RST value: 0
SCPI: device-specific

Modes: A, VA

CALCulate<1|2>:LIMit<1 to 8>:LOWer:MODE RELative | ABSolute

This command selects the relative or absolute scaling for the Y-axis of the selected lower limit line.

Example: "CALC:LIM:LOW:MODE REL"

Features: *RST value: ABSolute
SCPI: device-specific

Modes: A, VA

CALCulate<1|2>:LIMit<1 to 8>:LOWer:SHIFt <numeric_value>

This command shifts a limit line, which has relative values for the Y-axis (levels or linear units such as volt).

Example: "CALC:LIM:LOW:SHIF 20dB"

Features: *RST value: --
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:LIMit<1 to 8>:LOWer:SPACing LINear | LOGarithmic

This command makes a selection between linear and logarithmic interpolation for the lower limit line.

Example: "CALC:LIM:LOW:SPAC LIN"

Features: *RST value: LIN
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:LIMit<1 to 8>:FAIL?

This command queries the result of the limit check.

Example: "CALC:LIM:FAIL?"

Features: *RST value: -
SCPI: conforming

Modes: A, VA

The result of the limit check responds with 0 in case of PASS and with 1 in case of FAIL.

CALCulate<1|2>:LIMit<1 to 8>:CLEar[:IMMediate]

This command deletes the result of the current limit check.

Example: "CALC:LIM:CLE"

Features: *RST value: -
SCPI: conforming

Modes: A, VA

This command is an event which is why it is not assigned an *RST value.

CALCulate<1|2>:LIMit<1 to 8>:COMMent <string>

This command defines a comment for the limit line selected.

Example: "CALC:LIM:COMM 'Upper limit for spectrum'"

Features: *RST value: blank comment
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:LIMit<1 to 8>:COPY 1 to 8 | <name>

This command copies one limit line onto another one.

Parameter: 1 to 8 ::= number of the new limit line or, alternatively:
<name> ::= name of the new limit line given as a string

Example: "CALC:LIM1:COPY 2"
"CALC:LIM1:COPY 'GSM2'"

Features: *RST value: --
SCPI: device-specific

Modes: E, A, VA

The name of the limit line may contain a maximum of 8 characters. This command is an "event" which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:LIMit<1 to 8>:NAME <name off limit line>

This command assigns a name to a limit line numbered 1 to 8. If it doesn't exist previously, a limit line with this name is created.

Example: "CALC:LIM1:NAME 'GSM1'"

Features: *RST value: 'REM1' to 'REM8' for lines 1 to 8
SCPI: device-specific

Modes: E, A, VA

The name of the limit line may contain a maximum of 8 characters.

CALCulate<1|2>:LIMit<1 to 8>:DELete

This command deletes the limit line selected.

Examples: "CALC:LIM1:DEL"

Features: *RST value: --
SCPI: device-specific

Modes: E, A, VA

This command is an "event" which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:LIMit<1 to 8>:ACPower[:STATe] ON | OFF

This command switches on and off the limit check for adjacent channel power measurements. The commands CALC:LIM:ACP:ACH:STAT or CALC:LIM:ACP:ALT:STAT 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.

Examples: "CALC:LIM:ACP ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: A, VA

The numeric suffixes <1|2> or <1 to 8> are not significant for this command.

CALCulate<1|2>:LIMit<1 to 8>:ACPower:ACHannel 0 to 100 dB, 0 to 100 dB

This command defines the limit for the upper/lower adjacent channel for adjacent channel power measurements.

Parameter: The first (second) numeric value is the limit for the upper (lower) adjacent channel.

Examples: "`CALC:LIM:ACP:ACH 30DB, 30DB`"

Features: *RST value: 0 dB
SCPI: device-specific

Modes: A, VA

The numeric suffixes <1|2> or <1 to 8> are not significant for this command.

CALCulate<1|2>:LIMit<1 to 8>:ACPower:ACHannel:STATe ON | OFF

This command activates the limit check for the adjacent channel when adjacent channel power measurement is performed. Before, the limit check must be activated using `CALC:LIM:ACP ON`.

Examples: "`CALC:LIM:ACP:ACH:STAT ON`"

Features: *RST value: OFF
SCPI: device-specific

Modes: A, VA

The numeric suffixes <1|2> or <1 to 8> are not significant for this command.

CALCulate<1|2>:LIMit<1 to 8>:ACPower:ACHannel:RESult?

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

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.

Examples: "`CALC:LIM:ACP:ACH:RES?`"

Features: *RST value: --
SCPI: device-specific

Modes: A, VA

This command is a query and therefore not assigned a *RST value. If the power measurement of the adjacent channel is switched off, the command triggers a query error.
The numeric suffixes <1|2> or <1 to 8> are not significant for this command.

CALCulate<1|2>:LIMit<1 to 8>:ACPower:ALTernate<1|2> 0 to 100DB, 0 to 100 dB.

This command defines the limit for the first/second alternate adjacent channel for adjacent channel power measurements.

Parameter: The first (second) numeric value is the limit for the lower (upper) alternate adjacent channel. The numeric suffix after `ALTernate<1|2>` denotes the first or the second alternate channel.

Examples: `"CALC:LIM:ACP:ALT2 30DB 30DB"`

Features: *RST value: 0DB
SCPI: device-specific

Modes: A, VA

The numeric suffixes <1|2> or <1 to 8> are not significant for this command.

CALCulate<1|2>:LIMit<1 to 8>:ACPower:ALTernate<1|2>:STATe ON | OFF

This command activates the limit check for the first/second alternate adjacent channel for adjacent channel power measurements. Before, the limit check must be activated using `CALC:LIM:ACP ON`.

Examples: `"CALC:LIM:ACP:ALT2:STAT ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: A, VA

The numeric suffixes <1|2> or <1 to 8> are not significant for this command.

CALCulate<1|2>:LIMit<1 to 8>:ACPower:ALTernate<1|2>:RESult?

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

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.

Examples: `"CALC:LIM:ACP:ALT2:RES?"`

Features: *RST value: --
SCPI: device-specific

Modes: A, VA

This command is a query and therefore not assigned a *RST value. If the power measurement of the adjacent channel is switched off, the command triggers a query error.
The numeric suffixes <1|2> or <1 to 8> are not significant for this command.

3.6.4.6 CALCulate:MARKer Subsystem

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

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:MARKer<1 to 4>			
[:STATe]	<Boolean>	--	
:AOFF			no query
:TRACe	<numeric_value>	--	
:X	<numeric_value>	HZ | S | SYM	
:SLIMits			
[:STATe]	<Boolean>		
:COUNt	<Boolean>	--	
:RESolution	<numeric_value>	HZ	
:FREQuency?	--	--	query only
:COUPled			
[:STATe]	<Boolean>		
:LOEXclude	<Boolean>		
:Y?	--	--	query only
:MAXimum			
[:PEAK]	--	--	no query
:APEak	--	--	no query, Vector Signal Analysis
:NEXT	--	--	no query
:RIGHt	--	--	no query
:LEFT	--	--	no query
:MINimum			
[:PEAK]	--	--	no query
:NEXT	--	--	no query
:RIGHt	--	--	no query
:LEFT	--	--	no query
:STEP			
[:INCRement]	<numeric_value>	HZ | S | SYM	
:AUTO	<Boolean>	--	
:PEXCursion	<numeric_value>	DB	
:READout	MPHase | RIMaginary		Vector Signal Analysis
:FUNCtion			
:NDBDown	<numeric_value>	DB	
:STATe	<Boolean>		
:RESult?	--	--	query only
:FREQuency?	--	--	query only
:ZOOM	<numeric_value>	HZ	no query
:NOISe			
[:STATe]	<Boolean>		
:RESult?	--	--	query only
:DEModulation			
:SELect	AM|FM		
[:STATe]	<Boolean>		
:HOLDoff	<numeric_value>	S	
:SFACtor	<expr>		
:STATe	<Boolean>		
:RESult?	--	--	query only
:FREQuency?	--	--	query only

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:MARKer			
:FUNCtion			
:STRack	<Boolean>		
[:STATe]			
:ADEMod			Vector Signal Analysis
:AM			
[:RESult]?	PPEak | MPEak | MIDDle | RMS		query only
:FM			
[:RESult]?	PPEak | MPEak | MIDDle | RMS | RDEV		query only
:PM			
[:RESult]?	PPEak | MPEak | MIDDle | RMS		query only
:AFRequency			
[:RESult]?			query only
:FERRor			
[:RESult]?			query only
:SINad			
[:STATe]	<Boolean>		
:RESult?			query only
:CARRier			
[:RESult]?			query only
:DDEMod			Vector Signal Analysis
:RESult?	MERM | MEPK | MEPS | PERM | PEPK | PEPS |EVRM | EVPK | EVPS | IQOF | IQIM | ADR | FERR | DEV | FSRM | FSPK | FSPS | RHO |FEPK | DTTS		query only
:POWer			no query
:SELect	ACPower | CPOWer | OBANdwidth | OBWidth | CN | CN0		query only
:RESult?	ACPower | CPOWer | OBANdwidth | OBWidth | CN | CN0		
:PRESet	NADC | TETRA | PHS| PDC | CDPD | F8CDma | R8CDma | F19Cdma | R19Cdma | NONE		
:CFILter	<Boolean>		
[:STATe]	OFF		
:SUMMary			
:STATe	<Boolean>		Vector Signal Analysis
:MAXimum			
[:STATe]	<Boolean>		query only
:RESult?			Vector Signal Analysis
:PPEak			
[:STATe]	<Boolean>		query only
:RESult?			Vector Signal Analysis
:MPEak			
[:STATe]	<Boolean>		query only
:RESult?			Vector Signal Analysis
:MIDDle			
[:STATe]	<Boolean>		query only
:RESult?			
:RMS			
[:STATe]	<Boolean>		query only
:RESult?			
:MEAN			
[:STATe]	<Boolean>		query only
:RESult?			

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:MARKer			
:FUNCtion			
:SUMMary			
:PHOLd	<Boolean>		
:AVERage	<Boolean>		no query
:CENTer			no query
:CSTep			no query
:STARt			no query
:STOP			no query
:MSTep			no query
:REFerence			no query

CALCulate<1|2>:MARKer<1 to 4>[:STATe] ON | OFF

This command switches on or off the currently selected marker. If no indication is made, marker 1 is selected automatically.

Example: "CALC:MARK3 ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:MARKer<1 to 4>:AOFF

This command switches off all active markers.

Example: "CALC:MARK:AOFF"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:TRACe 1 to 4

This command assigns the selected marker (1 to 4) to the indicated test curve.

Example: "CALC:MARK3:TRAC 2"

Features: *RST value -
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:MARKer<1 to 4>:X 0 ... MAX (frequency | sweep time | symbols)

This command positions the selected marker to the indicated frequency (span > 0) or time (span = 0).

Example: "CALC:MARK:X 10.7MHz"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

Available units: receiver: Hz; analyzer: HZ | S; vector analyzer: HZ | S | SYM

CALCulate<1|2>:MARKer<1 to 4>:X:SLIMits[:STATe] ON | OFF

This command switches between a limited (ON) and unlimited (OFF) search range.

Example: "CALC:MARK:X:SLIM ON"

features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:MARKer<1 to 4>:COUNt ON | OFF

This command switches on or off the frequency counter at the marker position.

Example: "CALC:MARK:COUN ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

CALCulate<1|2>:MARKer<1 to 4>:COUNt:RESolution 0.1 | 1 | 10 | 100 | 1000 | 10000 Hz

This command specifies the resolution of the frequency counter.

Example: "CALC:MARK:COUN:RES 1kHz"

Features: *RST value: 1kHz
SCPI: device-specific

Mode: A

CALCulate<1|2>:MARKer<1 to 4>:COUNt:FREQuency

This command queries the result of the frequency counter.

Example: "CALC:MARK:COUN:FREQ?"

Features: *RST value: -
SCPI: device-specific

Mode: A

This command is only a query and thus has no *RST value.

CALCulate<1|2>:MARKer<1 to 4>:COUPled[:STATe] ON | OFF

This command switches the coupling of markers on or off.

Example: "CALC:MARK:COUP ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

The numeric suffix in MARKer<1 to 4> is not significant.

CALCulate<1|2>:MARKer<1 to 4>:LOEXclude ON | OFF

This command switches the local oscillator suppression on or off.

Example: "CALC:MARK:LOEX ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A-F

The numeric suffixes 1|2 and 1 to 4 are not significant.

CALCulate<1|2>:MARKer<1 to 4>:Y?

This command queries the selected marker value.

Example: "CALC:MARK:Y?"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

CALCulate<1|2>:MARKer<1 to 4>:MAXimum[:PEAK]

This command positions the marker to the current maximum value in the trace memory.

Example: "CALC:MARK:MAX"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:MAXimum:APEak

This command positions the marker to the maximum absolute value of the trace.

Example: "CALC:MARK:MAX:APE"

Features: *RST value: -
SCPI: device-specific

Mode: VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:MAXimum:NEXT

This command positions the marker to the next lower maximum value in the trace memory.

Example: "CALC:MARK:MAX:NEXT"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:MAXimum:RIGHt

This command positions the marker to the next smaller maximum value to the right of the current value (i.e., in ascending X direction) in the trace memory.

Example: "CALC:MARK:MAX:RIGH"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:MAXimum:LEFT

This command positions the marker to the next smaller maximum value to the left of the current value (i.e., in descending X direction) in the trace memory.

Example: "CALC:MARK:MAX:LEFT"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:MINimum[:PEAK]

This command positions the marker to the current minimum value in the trace memory.

Example: "CALC:MARK:MIN"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:MINimum:NEXT

This command positions the marker to the next higher minimum value in the trace memory.

Example: "CALC:MARK:MIN:NEXT"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:MINimum:RIGHt

This command positions the marker to the next higher minimum value to the right of the current value (ie in ascending X direction).

Example: "CALC:MARK:MIN:RIGH"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:MINimum:LEFT

This command positions the marker to the next higher minimum value to the left of the current value (ie in descending X direction).

Example: "CALC:MARK:MIN:LEFT"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

is command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:STEP[:INCRement] <numeric_value>

This command defines the marker step width.

Example: "CALC:MARK:STEP 10kHz" (frequency domain)
CALC:MARK:STEP 5ms" (time domain)

Features: *RST value: - (STEP is set to AUTO)
SCPI: device-specific

Mode: A

This command sets STEP:AUTO to OFF. The numeric suffix in MARKer<1 to 4> is not significant.

CALCulate<1|2>:MARKer<1 to 4>:STEP:AUTO ON | OFF

This command switches the automatic adaptation of the marker step width on or off.

Example: "CALC:MARK:STEP:AUTO OFF"

Features: *RST value: ON
SCPI: device-specific

Mode: A

With AUTO ON, the step width is 10% of the span. The numeric suffix in MARKer<1 to 4> is not significant.

CALCulate<1|2>:MARKer<1 to 4>:PEXCursion <numeric_value>

This command defines the peak excursion.

Example: "CALC:MARK:PEXC 10dB"

Features: *RST value: 6dB
SCPI: device-specific

Modes: E, A, VA

The numeric suffix in MARKer<1 to 4> is not significant.

CALCulate<1|2>:MARKer<1 to 4>:READout MPHase | RIMaginary

This command determines the type of the marker display.

Example: "CALC:MARK:READ RIM"

Features: *RST value: -
SCPI: device-specific

Mode: VA-D

The numeric suffix in MARKer<1 to 4> is not significant.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:NDBDown <numeric_value>

This command defines the "N dB Down" value.

Example: "CALC:MARK:FUNC:NDBD 3dB"

Features: *RST value: 6dB
SCPI: device-specific

Mode: A

The temporary markers T1 and T2 are positioned by n dB below the active reference marker. The frequency spacing of these markers can be queried with CALCulate:MARKer:FUNCtion:NDBDown:RESult?.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:NDBDown:STATe ON | OFF

This command switches the "N dB Down" function on or off.

Example: "CALC:MARK:FUNC:NDBD:STAT ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:NDBDown:RESult?

This command queries the frequency spacing (bandwidth) of the "N dB Down" markers.

Example: "CALC:MARK:FUNC:NDBD:RES?"

Features: *RST value: -
SCPI: device-specific

Mode: A

This command is only a query which is why it is not assigned an *RST value.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:NDBDown:FREQuency?

This command queries the frequencies of the "N dB Down" marker.

Example: "CALC:MARK:FUNC:NDBD:FREQ?"

Features: *RST value: -
SCPI: device-specific

Mode: A

The two frequency values are separated by comma and indicated in ascending order. This command is only a query which is why it is not assigned an *RST value.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ZOOM <numeric_value>

This command defines the range to be enlarged around the active marker.

Example: "CALC:MARK:FUNC:ZOOM 1kHz"

Features: *RST value: -
SCPI: device-specific

Mode: A-F

The subsequent frequency sweep is stopped at the marker position and the frequency of the signal is counted. This frequency becomes the new center frequency, the zoomed span is then set. This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:NOISe[:STATe] ON | OFF

This command switches the noise measurement on or off.

Example: "CALC:MARK:FUNC:NOIS ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

The noise power density is measured at the position of the markers. The result can be queried with CALCulate:MARKer:FUNCtion:NOISe:RESult?.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:NOISe:RESult?

This command queries the result of the noise measurement.

Example: "CALC:MARK:FUNC:NOIS:RES?"

Features: *RST value: -
SCPI: device-specific

Mode: A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:DEModulation:SELect AM | FM

This command selects the demodulation type.

Example: "CALC:MARK:FUNC:DEM:SEL FM"

Features: *RST value: AM
SCPI: device-specific

Mode: A

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:DEModulation[:STATe] ON | OFF

This command switches the demodulation on or off.

Example: "CALC:MARK:FUNC:DEM ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

With demodulation switched on, the frequency sweep is stopped at the marker position and the signal is demodulated during the given stop time.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:DEModulation:HOLDoff 10ms to 1000s

This command defines the duration of the stop time for the demodulation.

Example: "CALC:MARK:FUNC:DEM:HOLD 3s"

Features: *RST value: - (DEModulation is set to OFF)
SCPI: device-specific

Mode: A

With demodulation switched on, the frequency sweep is stopped at the marker position and the signal is demodulated during the given stop time.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SFACtor (60dB/3dB) | (60dB/6dB)

This command defines the shape factor measurement 60dB/6dB or 60dB/3dB.

Example: "CALC:MARK:FUNC:SFAC (60dB/3dB)"

Features: *RST value: (60dB/6dB)
SCPI: device-specific

Mode: A

The temporary markers T1 to T4 are positioned in pairs by 60dB and by 3dB or 6dB below the active reference marker. The frequency spacing ratio of these markers - the shape factor - can be queried with CALCulate:MARKer:FUNCtion:SFACtor:RESult?.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SFACtor:STATe ON | OFF

This command switches the shape factor measurement on or off.

Example: "CALC:MARK:FUNC:SFAC:STAT ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SFACtor:RESult?

This command queries the result of the shape factor measurement.

Example: "CALC:MARK:FUNC:SFAC:RES?"

Features: *RST value: -
SCPI: device-specific

Mode: A

This command is an event which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SFACtor:FREQuency?

This command queries the frequencies of the shape factor measurement.

Example: "CALC:MARK:FUNC:SFAC:FREQ?"

Features: *RST value: -
SCPI: device-specific

Mode: A

Four frequency values (at -60 dB, -6 or. -3 dB, -6 or -3 dB, -60dB) are indicated in ascending order. They are separated by a comma. This command is only a query which is why it is not assigned an *RST value.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:STRack[:STATe] ON | OFF

This command switches the signal-track function on or off.

Example: "CALC:MARK:FUNC:STR ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A-F

With SIGNAL TRACK function activated, the maximum signal is determined after each frequency sweep and the center frequency of this signal is set. With drifting signals the center frequency follows the signal.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ADEMod:AM[:RESult]? PPEak | MPEak | MIDDle | RMS

This command queries the results of the AM modulation measurement of the analog demodulation.

Example: "CALC:MARK:FUNC:ADEM:AM? PPE"

Features: *RST value: -
SCPI: device-specific

Mode: VA-A

PPEak	Result of the measurement with detector +PK
MPEak	Result of the measurement with detector -PK
MIDDle	Result of averaging ±PK/2
RMS	Result of the measurement with detector RMS

In the modulation modes FM or PM query of the MIDDle-result is possible only.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ADEMod:FM[:RESult]? PPEak | MPEak | MIDDle | RMS | RDEV

This command queries the results of the FM modulation measurement of the analog demodulation.

Example: "CALC:MARK:FUNC:ADEM:FM? PPE"

Features: *RST value: -
SCPI: device-specific

Mode: VA-A

PPEak	Result of the measurement with detector +PK
MPEak	Result of the measurement with detector -PK
MIDDle	Result of averaging ±PK/2
RMS	Result of the measurement with detector RMS

In the modulation modes FM or PM query of the MIDDle-result is possible only.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ADEMod:PM[:RESult]? PPEak | MPEak | MIDDle | RMS

This command queries the results of the PM modulation measurement of the analog demodulation.

Example: "CALC:MARK:FUNC:ADEM:PM? PPE"

Features: *RST value: -
SCPI: device-specific

Mode: VA-A

PPEak	Result of the measurement with detector +PK
MPEak	Result of the measurement with detector -PK
MIDDle	Result of averaging ±PK/2
RMS	Result of the measurement with detector RMS

In the modulation modes FM or PM query of the MIDDle-result is possible only.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ADEMod:AFRequency[:RESult]?

This command queries the audio frequency of the analog demodulation.

Example: "CALC:MARK:FUNC:ADEM:AFR? "

Features: *RST value: -
SCPI: device-specific

Mode: VA-A

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ADEMod:FERRor[:RESult]?

This command queries the frequency error of the analog demodulation.

Example: "CALC:MARK:FUNC:ADEM:FERR? "

Features: *RST value: -
SCPI: device-specific

Mode: VA-A

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ADEMod:CARRier[:RESult]?

This command queries the results of the carrier frequency measurement.

Example: "CALC:MARK:FUNC:ADEM:CARR?"

Features: *RST value: -
SCPI: device-specific

Mode: VA-A

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ADEMod:SINad[:STATe] ON | OFF

This command switches the SINAD measurement on or off.

Example: "CALC:MARK:FUNC:ADEM:SIN ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: VA-A

This command is valid only in the analog demodulation mode with Real Time ON.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:ADEMod:SINad:RESult?

This command queries the results of the SINAD measurement.

Example: "CALC:MARK:FUNC:ADEM:SIN:RES?"

Features: *RST value: -
SCPI: device-specific

Mode: VA-A

This command is only a query and thus has no *RST value assigned.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:DDEMod:RESult? MERM | MEPK | MEPS | PERM | PEPK | PEPS | EVRM | EVPK | EVPS | IQOF | IQIM | ADR | FERR | RHO

This command queries the error measurement results of digital demodulation.

Example: "CALC:MARK:FUNC:DDEM:RES? EVRM"

Features: *RST value: -
SCPI: device-specific

Mode: VA-D

MERM	magnitude error in %rms	FERR	frequency error in Hz
MEPK	maximum of magnitude error in %pk	FEPK	maximum of frequency error in Hz
MEPS	symbol number by which the maximum of the magnitude error occurred	ADR	amplitude drop in dB/symbol
PERM	phase error in deg	RHO	Rho-Factor
PEPK	maximum of phase error in deg	DEV	FSK deviation in Hz
PEPS	symbol number by which the maximum of the phase error occurred		
EVRM	vector error in %rms	FSPK	maximum of FSK deviation error in Hz
EVPK	maximum of vector error in %pk		
EVPS	symbol number by which the maximum of the vector error occurred	FSRM	FSK deviation error in Hz
		FSPS	symbol number by which the maximum of error occurred
IQOF	I/Q-offset error in %	DTTS	trigger delay of synchronization
IQIM	I/Q Imbalance in %		

CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:SELect ACPower | CPOWer | OBANdwidth | OBWidth | CN | CN0

This command selects the power measurement and switches it on.

Example: "CALC:MARK:FUNC:POW:SEL ACP"

Features: *RST value: -
SCPI: device-specific

Mode: A-F

ACPower	adjacent channel power measurement
CPOWer	channel power measurement
OBANdwidth | OBWidth	occupied bandwidth power measurement
CN	signal / noise power measurement
CN0	signal-/ noise power measurement based on 1Hz bandwidth

This command is an event which is why it is not assigned an *RST value and query.

CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:RESult? ACPower | CPOWer | OBANdwidth | OBWidth | CN | CN0

This command queries the results of the power measurement (see also `CALCulate:MARKer:FUNCtion:POWer:SELect`.)

Example: "`CALC:MARK:FUNC:POW:RES? OBW`"

Features: *RST value: -
SCPI: device-specific

Modes: A, VA

ACPower
adjacent channel power measurement
Results are output separated by commas in the following order:
Power of main channel
Power of lower adjacent channel 1
Power of upper adjacent channel 1
Power of lower adjacent channel 2
Power of upper adjacent channel 2
...
The number of results depends on the number of adjacent channels selected.

With logarithmic scaling (RANGE LOG), the power is output in dBm, with linear scaling (RANGE LIN dB or LIN %) in W. If SENSe:POWer:ACHannel:MODE REL is selected, adjacent channel power is output in dB.

CPOWer
channel power measurement
With logarithmic scaling (RANGE LOG), the channel power is output in dBm, with linear scaling (RANGE LIN dB or LIN %) in W.

OBANdwidth | OBWidth
occupied bandwidth power measurement
The return value is the occupied bandwidth in Hz

CN
signal / noise power measurement
The return value is always in dB..

CN0
signal-/ noise power measurement based on 1Hz bandwidth
The return value is always in dB/Hz

This command is only a query which is why it is not assigned an *RST value.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:POWer[:STATe] OFF

This command switches the power measurement off.

Example: "CALC:MARK:FUNC:POW OFF"

Features: *RST value: -
SCPI: device-specific

Modes: A-F, VA-D

This command is an event which is why it is not assigned an *RST value.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:POWer:PRESet NADC | TETRA | PDC | PHS | CDPD | F8DCma | R8CDma | F19DCma | R19CDma | NONE

This command selects the settings for power measurement of one of the standards.

Example: "CALC:MARK:FUNC:POW:PRES NADC"

Features: *RST value: -
SCPI: device-specific

Mode: A-F

F8CDma	CDMA 800 forward
R8CDma	CDMA 800 reverse
F19CDma	CDMA 1900 forward
R19CDma	CDMA1900 reverse

The selection of a standard influences the parameters weighting filter, channel bandwidth and spacing, resolution and video bandwidth, as well as detector and sweep time.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:POWer:CFILter ON | OFF

This command switches the weighting filter for the selected standard on or off.

Example: "CALC:MARK:FUNC:POW:CFIL ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A-F

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:STATe ON | OFF

This command switches the messages selected by the summary marker (eg RMS and MEAN) on and off. One or several measurements can be selected with the commands listed in the following and then switched jointly on and off with SUMMary:STATe.

Example: "CALC:MARK:FUNC:SUMM:STAT ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A-Z, VA

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:MAXimum[:STATe] ON | OFF

This command switches on or off the measurement of the maximum of the absolute value.

Example: "CALC:MARK:FUNC:SUMM:MAX ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: VA

When the measurement is switched on, the summary marker is automatically activated (command SUMMary:STATe set to ON). When it is switched off, the summary marker remains switched on provided further measurements are selected. Otherwise the marker is switched off automatically.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:MAXimum:RESult?

This command queries the results of the measurement of the maximum of the absolute value.

Example: "CALC:MARK:FUNC:SUMM:MAX:RES?"

Features: *RST value: -
SCPI: device-specific

Mode: VA

This command is only a query and thus has no *RST value assigned.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:PPEak[:STATe] ON | OFF

This command switches on or off the measurement of the positive peak value.

Example: "CALC:MARK:FUNC:SUMM:PPE ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: VA

When the measurement is switched on, the summary marker is automatically activated (command SUMMary:STATe set to ON). When it is switched off, the summary marker remains switched on provided further measurements are selected. Otherwise the marker is switched off automatically.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:PPEak:RESult?

This command queries the result of the measurement of the positive peak value.

Example: "CALC:MARK:FUNC:SUMM:PPE:RES?"

Features: *RST value: -
SCPI: device-specific

Mode: VA

This command is only a query and thus has no *RST value assigned.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:MPEak[:STATe] ON | OFF

This command switches on or off the measurement of the negative peak value.

Example: "CALC:MARK:FUNC:SUMM:MPE ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: VA

When the measurement is switched on, the summary marker is automatically activated (command SUMMary:STATe set to ON). When it is switched off, the summary marker remains switched on provided further measurements are selected. Otherwise the marker is switched off automatically.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:MPEak:RESult?

This command queries the result of the measurement of the negative peak value.

Example: "CALC:MARK:FUNC:SUMM:MPE:RES?"

Features: *RST- value: -
SCPI: device-specific

Mode: VA

This command is only a query and thus has no *RST value assigned.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:MIDDle[:STATe] ON | OFF

This command switches on or off the measurement of the arithmetical mean between positive and negative peak value.

Example: "CALC:MARK:FUNC:SUMM:MIDD ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: VA

When the measurement is switched on, the summary marker is automatically activated (command SUMMary:STATe set to ON). When it is switched off, the summary marker remains switched on provided further measurements are selected. Otherwise the marker is switched off automatically.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:MIDDle:RESult?

This command queries the result of the measurement of the arithmetical mean between positive and negative peak value.

Example: "CALC:MARK:FUNC:SUMM:MIDD:RES? "

Features: *RST- value: -
SCPI: device-specific

Mode: VA

This command is only a query and thus has no *RST value assigned

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:RMS[:STATe] ON | OFF

This command switches on or off the measurement of the effective (rms) value of the total trace.

Example: "CALC:MARK:FUNC:SUM:RMS ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: A-Z, VA

When the measurement is switched on, the summary marker is automatically activated (command SUMMary:STATe set to ON). When it is switched off, the summary marker remains switched on provided further measurements are selected. Otherwise the marker is switched off automatically.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:RMS:RESult?

This command queries the results of the rms value measurement.

Example: "CALC:MARK:FUNC:SUM:RMS:RES?"

Features: *RST value: -
SCPI: device-specific

Modes: A-Z, VA

This command is only a query and thus has no *RST value assigned.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:MEAN[:STATe] ON | OFF

This command switches on or off the measurement of the mean value of the total trace.

Example: "CALC:MARK:FUNC:SUMM:MEAN ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: A-Z, VA

When the measurement is switched on, the summary marker is automatically activated (command SUMMary:STATe set to ON). When it is switched off, the summary marker remains switched on provided further measurements are selected. Otherwise the marker is switched off automatically.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:MEAN:RESult?

This command queries the result of the measurement of the mean value of the total trace.

Example: "CALC:MARK:FUNC:SUMM:MEAN:RES?"

Features: *RST- value: -
SCPI: device-specific

Modes: A-Z, VA

This command is only a query and thus has no *RST value assigned.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:PHOLd ON | OFF

This command switches on or off the peak-hold function.

Example: "CALC:MARK:FUNC:SUMM:PHOL ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: A-Z, VA

The peak-hold function is reset by switching off and on, again.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:AVERage ON | OFF

This command switches the calculation of the average value on or off.

Example: "CALC:MARK:FUNC:SUMM:AVER ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: A-Z, VA

The calculation of the average is reset by switching off and on, again.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:SUMMary:AOFF

This command switches off all measuring functions.

Example: "CALC:MARK:FUNC:SUMM:AOFF"

Features: *RST value: _
SCPI: device-specific

Modes: A-Z, VA

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

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:CENTer

This command sets the center frequency to that of the current marker.

Example: "CALC:MARK:FUNC:CENT"

Features: *RST value: -
SCPI: device-specific

Modes: E, A-F

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

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:CSTep

This command sets the step width of the center frequency to the x-value of the current marker.

Example: "CALC:MARK:FUNC:CST"

Features: *RST value: -
SCPI: device-specific

Modes: E, A-F

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

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:STARt

This command sets the start frequency to the frequency of the current marker.

Example: "CALC:MARK:FUNC:STAR"

Features: *RST value: -
SCPI: device-specific

Modes: E, A-F

This command is an "event" which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:STOP

This command sets the stop frequency to the frequency of the current marker.

Example: "CALC:MARK:FUNC:STOP"

Features: *RST value: -
SCPI: device-specific

Modes: E, A-F

This command is an "event" which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:MSTep

This command sets the marker step width to the x-value of the current marker.

Example: "CALC:MARK:FUNC:MST"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an "event" which is why it is not assigned an *RST value and has no query.

CALCulate<1|2>:MARKer<1 to 4>:FUNCtion:REFerence

This command sets the reference level to that of the current marker.

Example: "CALC:MARK:FUNC:REF"

Features: *RST value: -
SCPI: device-specific

Modes: A, VA

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

3.6.4.7 CALCulate:MATH Subsystem

The CALCulate:MATH - subsystem allows to process data from the SENSe-subsystem in numeric expressions.

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:MATH<1 to 4>			
[:EXPRession]			
[:DEFine]	<expr>	--	
:STATe	<Boolean>	--	

CALCulate<1|2>:MATH<1 to 4>[:EXPression][:DEFine] <expr>

This command defines the mathematical expression for relating traces and reference line. Command `CALCulate:MATH:STATe` switches the mathematical relation of traces on or off .

Parameter: <expr>::= 'OP1 - OP2 [+ RLINE]'
OP1 ::= TRACE1 | TRACE2 | TRACE3 | TRACE4
OP2 ::= TRACE1 | TRACE2 | TRACE3 | TRACE4 | RLINE

Examples:
```
"CALC:MATH1 (TRACE1 - TRACE3 + RLINE)"
"CALC:MATH4 (TRACE4 - RLINE)"
```

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

The operand [+ RLINE] may be used only if OP2 is different from RLINE. The numeric suffix in CALCULATE<1|2> is not significant. The numeric suffix in MATH<1 to 4> denotes the trace where the result of the mathematical operation is stored. The number must be identical to the number of the operand OP1.

CALCulate<1|2>:MATH<1 to 4>:STATe ON | OFF

This command switches the mathematical relation of traces on or off.

Example:
```
"CALC:MATH1:STAT ON"
```

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

The numeric suffix in CALCULATE<1|2> is not significant. The numeric suffix in MATH<1 to 4> denotes the trace which the command refers to.

3.6.4.8 CALCulate:UNIT Subsystem

The CALCulate:Unit subsystem defines the units for vector signal analyzer mode and power measurements.

COMMAND	PARAMETERS	UNIT	COMMENT
CALCulate<1|2>			
:X			Vector Signal Analysis
:UNIT			
:TIME	S | SYM		
:UNIT			Vector Signal Analysis
:ANGLe	DEG | RAD		
:POWer	DBM | V | W | DB | PCT | UNITLESS | DBPW | WATT | DBUV | DBMV | VOLT | DBPT | DBUA | AMPere DBUV_MHZ | DBMV_MHZ | DBUA_MHZ | DBUV_M | DBUA_M | DBUV_MMHZ | DBUA_MMHZ		

CALCulate<1|2>:X:UNIT:TIME S | SYM

This command selects seconds or symbols as an x-axis unit.

Example: "CALC:X:UNIT:TIME S"

Features: *RST value: S
SCPI: device-specific

Mode: VA-D

CALCulate<1|2>: UNIT:ANGLe DEG | RAD

This command selects the unit for angular measurement.

Example: "CALC:UNIT:ANGL DEG"

Features: *RST- value: RAD
SCPI: device-specific

Mode: VA-D

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

This command selects the unit for power.

Example: "CALC:UNIT:POW DBM"

Features: *RST value: _
SCPI: device-specific

Modes: E, A, VA

In the receiver mode, the units DBM, DBUV, DBPT, DBUA, DBPW, DBT, DBUV_M und DBUA_M are available.

In the analyzer mode, all unit are available except for DBPT, DEG, RAD, S, HZ and PCT verfügbar.

In the vector analyzer mode, the units DEG, RAD, S, HZ, PCT are available.

DBUV_MHZ and DBUA_MHZ denote the units DBUV/MHZ or DBUA/MHZ.

3.6.5 CALibration Subsystem

The commands of the CALibration subsystem perform instrument calibrations.

COMMAND	PARAMETERS	UNIT	COMMENT
CALibration			
[:ALL]?	--	--	query only
:BANDwidth			
[:RESolution]?	--	--	query only
:BWIDth			
[:RESolution]?	--	--	query only
:IQ?	--	--	query only / Vector Signal Analysis
:LDETector?	--	--	query only
:LOSuppression?	--	--	query only
:PPEak?	--	--	query only
:PRESelector?	--	--	query only
:SHORt?	--	--	query only
:STATe	<Boolean>	--	

CALibration[:ALL]?

This command performs a complete calibration of the instrument. A "0" is returned if the calibration was successful.

Example: "CAL?"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

CALibration:BANDwidth | BWIDth[:RESolution]?

This command performs a calibration of the filter bandwidths. A "0" is returned if the calibration was successful.

Example: "CAL:BAND?"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

CALibration:IQ?

This command performs a calibration of the vector signal analyzer. A "0" is returned if the calibration was successful.

Example: "CAL:IQ?"

features: *RST value: -
SCPI: device-specific

Mode: VA

CALibration:LDETector?

This command performs a calibration of the log module's characteristic and of the detectors. A "0" is returned if the calibration was successful.

Example: "CAL:LDET?"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

CALibration:LOSuppression?

This command performs a calibration of the local oscillator suppression. . A "0" is returned if the calibration was successful.

Example: "CAL:LOS?"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is only valid by model '30 instruments or by instruments which have been retrofitted.

CALibration:PPEak?

This command performs a calibration of the tracking YIG filter (preselector peaking). A "0" is returned if the calibration was successful.

Example: "CAL:PPE?"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

CALibration:PRESelector?

This command performs a calibration of the preselector. If this is done successfully, "0" is returned.

Example: "CAL:PRES?"

Characteristics: *RST value: -
SCPI: device-specific

Modes: E

CALibration:SHORt?

This command performs a short calibration. A "0" is returned if the calibration was successful.

Example: "CAL:SHOR?"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

CALibration:STATe ON | OFF

This command determines whether (ON) or not (OFF) the current calibration data are taken into consideration.

Example: "CAL:STAT OFF"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

3.6.6 DIAGnostic Subsystem

The DIAGnostic subsystem contains the commands which support instrument diagnostics for maintenance, service and repair. In accordance with the SCPI standard, all of these commands are device-specific.

COMMAND	PARAMETERS	UNIT	COMMENT
DIAGnostic			
:SERVice			
:INPut			
[:SELect]	CALibration | RF	--	
:FUNCtion	<numeric_value>,>numeric_value>	--	no query
:NSOurce	<Boolean>	--	

DIAGnostic:SERVice:INPut[:SELect] CALibration | RF

This command toggles between the RF input on the front panel and the internal 120-MHz reference signal.

Example: `"DIAG:SERV:INP CAL"`

Features: *RST value: RF
SCPI: device-specific

Modes: E, A, VA

DIAGnostic:SERVice:FUNCtion <numeric_value>,<numeric_value>...

This command activates a service function.

Example: `"DIAG:SERV:FUNC 2,0,2,12,1"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

The service function is selected via five parameters: functional group number, board number, function number, parameter 1 and parameter 2.

DIAGnostic:SERVice:NSOurce ON | OFF

This command switches the 28-V supply at the rear connector of the noise source on and off.

Example: `"DIAG:SERV:NSO ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

3.6.7 DISPlay Subsystem

The DISPLay subsystem controls the selection and presentation of textual and graphic information as well as of trace data on the display.
The displays in the split-screen mode are assigned to WINDow 1 (screen A) or 2 (screen B) .

COMMAND	PARAMETERS	UNIT	COMMENT
DISPlay			
:FORMat	SINGle | SPLit		
:PROgram			
[:MODE]	<Boolean>		
:ANNotation			
:FREQuency	<Boolean>		
:LOGO	<Boolean>		
:CMAP<1 to 13>			
:DEFault			
:HSL	0 to 1,0 to 1,0 to 1		
:PDEFined	BLACk | BLUE | BROWn | GREen | CYAN | RED | MAGenta | YELLow | WHITe | DGRAy | LGRAy | LBLUe | LGREen | LCYan | LRED | LMAGenta		
[:WINDow<1|2>]			
:TEXT			
[:DATA]	<string>		
:STATe	<Boolean>		
:TIME	<Boolean>		
:MINFo	<Boolean>		
:TRACe<1 to 4>			
:X			Vector Signal Analysis
[:SCALe]			
:RVALue	<numeric_value>		
:ZOOM	<Boolean>		
[:FREQuency]			
:STARt	<numeric_value>	HZ	
:STOP	<numeric_value>	HZ	
:CENTer	<numeric_value>	HZ	
:SPACing	LINear | LOGarithmic	--	
:Y			
[:SCALe]	<numeric_value>	DB	
:MODE	ABSolute | RELative		
:RLEVel	<numeric_value>	DBM	
:OFFSet	<numeric_value>	DB	Vector Signal Analysis
:RVALue	<numeric_value>	DBM|DB|HZ| DEG|RAD	Analyzer mode only
:AUTO	<Boolean>		Vector Signal Analysis
:RPOSition	<numeric_value>	PCT	Vector Signal Analysis
:PDIVision	<numeric_value>	DBM|DB|HZ| DEG|RAD	
:BOTTom	<numeric_value>	--	
:TOP	<numeric_value>	--	
:SPACing	LINear|LOGarithmic|PERCent	--	

COMMAND	PARAMETERS	UNIT	COMMENT
DISPlay			
[:WONDow<1|2>]			
<TRACe<1 to 4>			
:MODE	WRITe | VIEW | AVERage | MAXHold | MINHold	--	
:CWRite	<Boolean>	--	Vector Signal Analysis
:ANALog	<Boolean>	--	
:HCONtinuous	<Boolean>	--	
[:STATe]	<Boolean>	--	
:SYMBol	DOTS | BARS | OFF		Vector Signal Analysis
:EYE			
:COUNt	<numeric_value>	SYM	Vector Signal Analysis

DISPlay:FORMat SINGle | SPLit

This command switches the test result display between FULL SCREEN and SPLIT SCREEN.

Example: "DISP:FORM SPL"

Features: *RST value: SINGle
SCPI: device-specific

Modes: E, A, VA

DISPlay:PROGram[:MODE] ON | OFF

This command switches the display between the measuring instrument and the computer function.

Example: "DISP:PROG ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

DISPlay:ANNotation:FREQuency ON | OFF

This command switches the x-axis annotation on or off.

Example: "DISP:ANN:FREQ OFF"

Features: *RST value: ON
SCPI: conforming

Modes: E, A, VA

DISPlay:LOGO ON | OFF

This command switches the factory logo on the screen on or off.

Example: "DISP:LOGO OFF"

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

DISPlay:CMAP<1 to 13>:DEFault

This command resets the screen colors of the instrument to their default settings.

Example: "DISP:CMAP:DEF"

Features: *RST value: --
SCPI: conforming

Modes: E, A, VA

This command is an event and has thus no query and no *RST value assigned. The numeric suffix in CMAP<1 to 13> is not significant.

DISPlay:CMAP<1 to 13>:HSL <hue>,<sat>,<lum>

This command defines the color table of the instrument.

Parameter: hue = TINT
sat = SATURATION
lum = BRIGHTNESS

The value range is 0 to 1 for all parameters.

Example: "DISP:CMAP2:HSL 0.3,0.8,1.0"

Features: *RST value: --
SCPI: conforming

Modes: E, A, VA

To each numeric suffix of CMAP is assigned one or several picture elements which can be modified by varying the corresponding color setting. The following assignment applies:

CMAP1	Trace 1	CMAP8	Soft key State Data Entry
CMAP2	Trace 2	CMAP9	Soft key State OFF
CMAP3	Trace 3	CMAP10	Soft key Shade
CMAP4	Trace 4	CMAP11	Text
CMAP5	Marker	CMAP12	Title
CMAP6	Grid	CMAP13	Background
CMAP7	Soft key State On		

The values set are not changed by *RST.

DISPlay:CMAP<1 to 13>:PDEFined BLACk | BLUE | BROWn | GREen | CYAN | RED | MAGenta | YELLow |WHITe | DGRAy | LGRAy | LBLUe | LGREen | LCYan |LRED | LMAGenta

This command defines the color table of the instrument using predefined color values. To each numeric suffix of CMAP is assigned one or several picture elements which can be modified by varying the corresponding color setting. The same assignment as for DISPlay:CMAP<1 to 13>:HSL applies.

Example: "DISP:CMAP2:PDEF GRE"

Features: *RST value: --
SCPI: conforming

Modes: E, A, VA

The values set are not changed by *RST.

DISPlay[:WINDow<1|2>]:MINFo ON | OFF

This command switches the marker info list on the screen on or off.

Example: "DISP:MINF ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

DISPlay[:WINDow<1|2>]:TEXT[:DATA] <string>

This command defines a comment (max. 50 characters) which can be displayed on the screen.

Example: "DISP:TEXT "signal/noise power measurement"

Features: *RST value: "" (empty)
SCPI: conforming

Modes: E, A, VA

The numeric suffix in WINDow<1|2> is not significant.

DISPlay[:WINDow<1|2>]:TEXT:STATe ON | OFF

This command switches on or off the screen display of the comment.

Example: "DISP:TEXT:STAT ON"

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

The numeric suffix in WINDow<1|2> is not significant.

DISPlay[:WINDow<1|2>]:TIME ON | OFF

This command switches on or off the screen display of date and time.

Example: "DISP:TIME ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

The numeric suffix in WINDow<1|2> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:X[:SCALe]:RVALue <numeric_value>

This command defines the reference value for the X-axis of the measuring diagram.

Example: "DISP:TRAC:X:RVAL 20SYM"

Features: *RST value: -
SCPI: device-specific

Mode: VA-D

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:X[:SCALe]:ZOOM ON | OFF

This command displays the zoomed current frequency range in the opposite window of the split screen representation.

Example: "DISP:TRAC:X:ZOOM ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A-F

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:X[:SCALe]:ZOOM[:FREQuency]:STARt <numeric_value>

This command defines the start frequency of the zoomed display range. The value must lie between start and stop frequency of the original range.

Example: "DISP:TRAC:X:ZOOM:STAR 100MHZ"

Features: *RST value: -- (depending on the current frequency setting)
SCPI: device-specific

Mode: A-F

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:X[:SCALe]:ZOOM[:FREQuency]:STOP <numeric_value>

This command defines the stop frequency of the zoomed display range. The value must lie between start and stop frequency of the original range.

Example: "DISP:TRAC:X:ZOOM:STOP 200MHZ"

Features: *RST value: -- (depending on the current frequency setting)
SCPI: device-specific

Mode: A-F

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:X[:SCALe]:ZOOM[:FREQuency]:CENTer <numeric_value>

This command shifts the zoomed frequency range to the specified center frequency.

Example: "DISP:TRAC:X:ZOOM:CENT 1GHZ"

Features: *RST value: -- (depending on the current frequency setting)
SCPI: device-specific

Mode: A-F

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:X:SPACing LINear | LOGarithmic

This command toggles between linear and logarithmic display.

Example: "DISP:TRAC:X:SPAC LIN"

Features: *RST value: LOGarithmic
SCPI: conforming

Modes: E, A

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y[:SCALe] 10dB to 200dB

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

Example: "DISP:TRAC:Y 110dB"

Features: *RST value: 100dB
SCPI: device-specific

Mode: A

For linear scaling, (DISP:TRAC:Y:SPAC LIN | PERC) the display range is fixed and cannot be set. The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y[:SCALe]:MODE ABSolute | RELative

This command defines the scale of the y-axis (absolute or relative).

Example: "DISP:TRAC:Y:MODE REL"

Features: *RST value: ABS
SCPI: device-specific

Mode: A

As long as SYSTem:DISPlay is set to OFF, this command does not directly influence the screen. The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y[:SCALe]:RLEVel -200dBm to 200dBm

This command defines the reference level.

Example: "DISP:TRAC:Y:RLEV -60dBm"

Features: *RST value: -20dBm
SCPI: conforming

Modes: A, VA

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y[:SCALe]:RLEVel:OFFSet -200dB to 200dB

This command defines the offset of the reference level.

Example: "DISP:TRAC:Y:RLEV:OFFS -10dB"

Features: *RST value: 0dB
SCPI: conforming

Modes: A, VA

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y[:SCALe]:RVALue <numeric_value>

In the spectrum analysis mode the setting corresponds to the parameter MAX LEVEL.

In the vector signal analysis mode the setting corresponds to the parameter REFERENCE VALUE Y AXIS.

IF option tracking generator is fitted and the normalization in the analyzer mode is activated, the value corresponds to the parameter REFERENCE VALUE.

Example: "DISP:TRAC:Y:RVAL -20dBm" (spectrum analysis)
"DISP:TRAC:Y:RVAL +1.20" (vector signal analysis)
"DISP:TRAC:Y:RVAL 0" (tracking generator)

Features: *RST value: - coupled to reference level
0 (vector signal analysis)
0 dB (tracking generator with active normalization)
SCPI: device specific

Modes: A, VA

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y[:SCALe]:RVALue:AUTO ON | OFF

This command defines whether the reference value for the y-axis of the measured diagram is coupled to the reference level (default) or can be set independently.

Example: "DISP:TRAC:Y:RVAL:AUTO ON"

Features: *RST value: ON
SCPI: device-specific

Mode: A

This command is available in the analyzer mode only. The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y[:SCALe]:RPOSition 0 to 100PCT

This command defines the position of the reference value. The numeric suffix in TRACe<1 to 4> is not significant.

Example: `"DISP:TRAC:Y:RPOS 50PCT"`

Features: *RST value: 100PCT (tracking generator)
50PCT (vector analyzer)
SCPI: conforming

Modes: A, VA

This command is only valid in conjunction with option Tracking Generator or in vector analyzer mode.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y[:SCALe]:PDIVision <numeric_value>

This command defines the scaling of the Y-axis in the current unit.

Example: `"DISP:TRAC:Y:PDIV +1.20"`

Features: *RST value: -
SCPI: conforming

Mode: VA

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:BOTTom <numeric_value>

This command defines the minimum grid level for the display in the receiver mode.

Example: `"DISP:TRAC:Y:BOTT -20"`

Features: *RST-Wert: 0

SCPI: konform

Mode: E

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:TOP <numeric_value>

This command defines the maximum grid level for the display in the receiver mode.

Example: `"DISP:TRAC:Y:TOP 120"`

Features: *RST-Wert: 100

SCPI: konform

Mode: E

The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:Y:SPACing LINear | LOGarithmic | PERCent

This command toggles between linear and logarithmic display.

Example: "DISP:TRAC:Y:SPAC LIN"

Features: *RST value: LOGarithmic
SCPI: conforming

Mode: A

The linear display can be LIN/% (PERCent) or LIN/dB (LINear). The numeric suffix in TRACe<1 to 4> is not significant.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:MODE WRITe | VIEW | AVERage | MAXHold | MINHold

This command defines the type of display and the evaluation of the traces.

Example: "DISP:TRAC3:MODE MAXH"

Features: *RST value: WRITe for TRACe1, STATe OFF for TRACe2 to 4
SCPI: device-specific

Modes: E, A, VA

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:MODE:CWRite ON | OFF

This command selects continuous display of the measured values (continuous write).

Example: "DISP:TRAC3:MODE:CWR ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: VA

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:MODE:ANALog ON | OFF

This command selects continuous display of the measured values in the analyzer mode (analog trace).

Example: "DISP:TRAC3:MODE:ANAL ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:MODE:HCONtinuous ON | OFF

This command defines whether the traces in the min hold/max hold mode are reset after some definite parameter changes.

Example: "DISP:TRAC3:MODE:HCON ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

OFF The traces are reset after some definite parameter changes.

ON This mechanism is switched off.

In general, parameter changes require a restart of the measurement before results are evaluated (e.g. with markers). For those changes that are known to require a new measurement (e.g. modification of the span), the trace is automatically reset so that erroneous evaluations of previous results are avoided. This mechanism can be switched off for those exceptional cases where the described behavior is unwelcome.

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>[:STATe] ON | OFF

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

Example: "DISP:TRAC3 ON"

Features: *RST value: ON for TRACe1, OFF for TRACe2 to 4
SCPI: conforming

Modes: E, A, VA

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:SYMBol DOTS | BARS | OFF

This command determines the display of the points of decision on the trace.

Example: "DISP:TRAC:SYMB BARS"

Features: *RST value: OFF
SCPI: device-specific

Mode: VA-D

DISPlay[:WINDow<1|2>]:TRACe<1 to 4>:EYE:COUNt 1 to Result Length

This command determines the display range of the eye diagram in symbols.

Example: "DISP:TRAC:EYE:COUNt 5"

Features: *RST value: 2
SCPI: device-specific

Mode: VA-D

3.6.8 FORMat Subsystem

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

COMMAND	PARAMETERS	UNIT	COMMENT
FORMat [:DATA]	ASCii|REAL|UINT[,<numeric_value>]	-	

FORMat[:DATA] ASCii | REAL | UINT [, 32]

This command specifies the data format of the data transmitted from and to the instrument.

Example:
```
"FORM REAL,32"
"FORM ASC"
```

Features: *RST value: ASCii
SCPI: conforming

Modes: E, A, VA

The data format is either ASCii or one of the formats REAL or UINT (Unsigned Integer). ASCii data are transmitted in plain text, separated by commas. REAL data are transmitted as 32-bit IEEE 754 floating-point numbers in the "definite length block". The format UINT is only used in operating mode Vector Signal Analysis, for the symbol table.

Format setting for the binary transmission of trace data (see also `TRACE:DATA?`):

Analyzer mode: REAL, 32

Vector analyzer: UINT, 8 with digital demodulation, symbol table
REAL, 32otherwise

Note: *Incorrect format setting will result in numerical conversion, which may lead to incorrect results.*

The FORMat command is valid for the transmission of trace data. The data format of trace data received by the instrument is automatically recognized, regardless of the format which is programmed.

3.6.9 HCOPy Subsystem

The HCOPy subsystem controls the output of display information for documentation purposes on output devices or files.

COMMAND	PARAMETERS	UNIT	COMMENT
HCOPy			
:ABORt	--		no query
:DESTination<1|2>	'SYST:COMM:PRIN'| 'SYST:COMM:CLIP' | 'MMEM'		no query
:DEVice			
:COLor	<Boolean>		
:LANGuage<1|2>	WMF | GDI | EWMF | BMP		
[:IMMediate<1|2>]	--		no query
:ITEM			
:ALL			no query
:FFEed<1|2>			
:STATe	<Boolean>		
:LABEL			
:TEXT	<string>		
:PFEed<1|2>			
:STATe	<Boolean>		
:WINDow<1|2>			
:TABle			
:STATe	<Boolean>		
:TEXT	<string>		
:TRACe			
:STATe	<Boolean>		
:CAINcrement	<Boolean>		
:PAGE			
:DIMensions			no query
:QUADrant<1 to 4>			no query
:FULL			
:ORIentation<1|2>	LANDscape|PORTrait		

HCOPy:ABORt

This command aborts a running hardcopy output.

Example: `"HCOP:ABOR"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and no query.

HCOPy:DESTination<1|2> <string>

This command selects the device for outputting the hardcopy..

Parameter: <string>::= 'MMEM' |
'SYST:COMM:PRIN' |
'SYST:COMM:CLIP'

Example: `"HCOP:DEST2 'MMEM'"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and no query.

`'MMEM'` creates a file for the hardcopy output. Command `MMEM:NAME <file_name>` defines the file name. All formats can be selected for `HCOPy:DEVice:LANGuage`.

`'SYST:COMM:PRIN'` directs the hardcopy to the printer. The printer is selected with command `SYSTEM:COMMunicate:PRINter:SELect`.
`GDI` should be selected for `HCOPy:DEVice:LANGuage`.

`'SYST:COMM:CLIP'` directs the hardcopy to the clipboard. `EWMF` should be selected for `HCOPy:DEVice:LANGuage`.

HCOPy:DEVice:COLor ON|OFF

This command selects between color and monochrome hardcopy of the screen.

Example: `"HCOP:DEV:COL ON"`

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

HCOPy:DEVice:LANGuage<1|2> WMF| EWMF | GDI | BMP

This command determines the data format of the printout.

Example: `"HCOP:DEV:LANG WMF"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

WMF and EWMF (WINDOWS Metafile and Enhanced Metafile Format)
Data formats for output files which can at a later time be integrated in corresponding programs for documentation purposes.

BMP (Bitmap) Data format for output files.

GDI (Graphics Device Interface) Default format for the output to a printer configured under Windows. For the output file the printer driver configured under Windows is used and thus a printer-specific format is generated.

HCOPy[:IMMediate<1|2>]

This command starts a hardcopy output.

Example: `"HCOP"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

`HCOP[1]` starts the hardcopy output to device 1 (default), `HCOP2` starts the output to device 2. This command is an event which is why it is not assigned an *RST value and has no query.

HCOPy:DEVice:ITEM:ALL

This command selects the complete screen to be output.

Example: `"HCOP:DEV:ITEM:ALL"`

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

The hardcopy output is always provided with comments, title, time and date. As an alternative to the whole screen, only traces (commands `'HCOPy:DEVice:WINDow:TRACe: STATe ON'`) or tables (command `'HCOPy:DEVice:WINDow:TABLe:STATe ON'`) can be output.

HCOPy:DEVice:ITEM:FFEed<1|2>:STATe ON|OFF

The command adds a form feed command to the hardcopy output of the screen.

Example: `"HCOP:DEV:ITEM:FFE2:STAT ON"`

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

HCOPy:DEVice:ITEM:LABel:TEXT <string>

This command defines the title of the screen with a maximum of 60 characters.

Example: `"HCOP:DEV:ITEM:LAB:TEXT 'My Title'"`

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

HCOPy:DEVice:ITEM:PFEed<1|2>:STATe ON|OFF

This command adds a paper feed command to the hardcopy output of the screen (ON).

Example: `"HCOP:DEV:ITEM:PFE2:STAT ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

HCOPy:DEVice:ITEM:WINDow<1|2>:TABle:STATe ON | OFF

This command selects the output of the currently displayed tables (ON).

Example: `"HCOP:DEV:ITEM:WIND:TABL:STAT ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

The command `HCOPy:DEVice:ITEM:WINDow<1|2>:TABle:STATe OFF` same as command `HCOPy:DEVice:ITEM:ALL` enables the output of the whole screen.

HCOPy:DEVice:ITEM:WINDow<1|2>:TEXT <string>

This command defines the comment text for printout to trace 1 or 2 with a maximum of 100 characters.

Example: `"HCOP:DEV:ITEM:WIND2:TEXT 'comment'"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

HCOPy:DEVice:ITEM:WINDow<1|2>:TRACe:STATe ON | OFF

This command selects the output of the currently displayed trace (ON).

Example: `"HCOP:DEV:ITEM:WIND:TRACe:STAT ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

The command `HCOPy:DEVice:ITEM:WINDow<1|2>:TRACe:STATe OFF` same as command `HCOPy:DEVice:ITEM:ALL` enables the output of the whole screen.

HCOPy:DEVice:ITEM:WINDow<1|2>:TRACe:CAINcrement ON | OFF

The command automatically changes the colour of the currently displayed trace after printout (ON).

Example: `"HCOP:DEV:ITEM:WIND:TRACe:CAIN ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

The automatic change of colour of the trace allows outputting to a plotter of several traces of the same diagram. For a better distinction, the colour of the trace is changed (”Color Auto Increment”).

HCOPy:PAGE:DIMensions:QUADrant<1 to 4>

The command defines the quadrant which is allocated to the screen output.

Example: `"HCOP:PAGE:DIM:QUAD1"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

The quadrants are defined as QUAD1 at the top right, QUAD2 at the top left, QUAD3 at the bottom left and QUAD4 at the bottom right. This command is an event which is why it is not assigned an *RST value and has no query.

HCOPy:PAGE:DIMensions:FULL

This command defines that the full screen is to be printed out.

Example: `"HCOP:PAGE:DIM:FULL"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an event which is why it is not assigned and *RST value and has no query.

HCOPy:PAGE:ORIentation<1|2> LANDscape | PORTrait

The command selects the format of the output (portrait and landscape) (hardcopy unit 1 or 2).

Example: `"HCOP:PAGE:ORI LAND"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

3.6.10 INITiate Subsystem

The INITiate subsystem checks the initialization of the trigger subsystem.
In receiver mode, a distinction is made between single measurement (INITiate1) and scan (INITiate2). In signal analyzer mode, a distinction is made between INITiate1 (screen A) and INITiate2 (screen B) in split screen representation.

COMMAND	PARAMETERS	UNIT	COMMENT
INITiate<1|2>			
:CONTinuous	<boolean>	--	
:CONMeas	--	--	no query
[:IMMediate]	--	--	no query
:DISPlay	<boolean>	--	

INITiate<1|2>:CONTinuous ON | OFF

This command determines if the trigger system is continuously initiated ("Free Run").

Example: `"INIT:CONT OFF"`

Features: *RST value: ON
SCPI: conforming

Modes: E, A, VA

Setting "`INITiate:CONTinuous ON`" corresponds to function SCAN/SWEEP CONTinuous, ie the scan/sweep of the receiver/analyzer is cyclically repeated. The setting "`INITiate:CONTinuous OFF`" corresponds to function SCAN/SWEEP SINGLE.

INITiate<1|2>:CONMeas

This command continues the sweep from the current sweep position.

Syntax: INITiate<1|2>:CONMeas

Example: `"INIT:CONM"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an event and therefore has no *RST value and no query.
Sweeps are stopped, for example, in the case of transducer sets between the different transducer factors.

INITiate<1|2>[:IMMediate]

The command initiates a new sweep or starts a single sweep.

Example: `"INIT"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

INITiate<1|2>:DISPlay ON | OFF

This command switches the display on or off during a single sweep.

Example: `"INIT:DISP OFF"`

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

3.6.11 INPut Subsystem

The INPut subsystem checks the input features of the instrument. In receiver mode, the suffix is not significant. In analyzer mode, a distinction is made between INPut1 (screen A) and INPut2 (screen B) in the split-screen representation.

COMMAND	PARAMETERS	UNIT	COMMENT
INPut<1|2>			
:ATTenuation	<numeric_value>	DB	
:AUTO	<Boolean>	--	
:MODE	NORMal | LNOise|LDIStortion	--	
:PROTection	<Boolean>	--	
:UPORt<1|2>			
[:VALue]?	--	--	query only
:STATe	<Boolean>	--	
:IMPedance	50 | 75	OHM	
:CORRection	RAM | RAZ		
:MIXer	<numeric_value>	DBM	
:COUPling	AC | DC	dB	
:GAIN			
:STATe	<Boolean>		
:AUTO	<Boolean>		
:TYPE	INPUT1 |INPUT2		

INPut<1|2>:ATTenuation 0 to 70 dB

This command programs the input attenuator.

Example: `"INP:ATT 40dB"`

Features: *RST value: - (AUTO is set to ON)
SCPI: conforming

Modes: E, A, VA

The attenuation of the input calibration line can be programmed in steps of 10 dB. If the attenuation is programmed directly, the coupling to the reference level is switched off.The attenuation of the input calibration line can be programmed in steps of 10 dB (INPUT1) and 5 dB (INPUT2). If the attenuation is programmed directly, the autorange function (receiver) and coupling to the reference level (analyzer) are switched off.

INPut<1|2>:ATTenuation:AUTO ON | OFF

This command automatically couples the input attenuation to the reference level.

Example: `"INP:ATT:AUTO ON"`

Features: *RST value: ON
SCPI: conforming

Modes: E, A, VA

INPut<1|2>:ATTenuation:AUTO:MODE NORMal | LNOise | LDIStortion

This command optimizes the coupling of the input attenuation to the reference level to high sensitivity or to high intermodulation immunity.

Example: `"INP:ATT:AUTO:MODE LDIS"`

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

For `LNOise`, the input attenuator value is set 10 dB lower than for `INPut:ATTenuation:AUTO:MODE NORMal`, for `LDIStortion` it is set 10 dB higher.

INPut<1|2>:ATTenuation:PROTection ON | OFF

This command defines whether the 0 dB position of the attenuator is to be used in manual or automatic adjustment.

Example: `"INP:ATT:PROT ON"`

Features: *RST-Wert: OFF
SCPI: device-specific

Mode: E

INPut<1|2>:UPORt<1|2>[:VALue]?

This command queries the control lines of the user ports.

Example: `"INP:UPOR2?"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is a query command which is why it is not assigned an *RST value.

INPut<1|2>:UPORt<1|2>:STATe ON | OFF

This command toggles the control lines of the user ports between INPut and OUTPut.

Example: `"INP:UPOR2:STAT ON"`

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

With ON, the user port is switched to INPut, with OFF to OUTPut.

INPut<1|2>:IMPedance 50 | 75

This command sets the nominal input impedance of the instrument.

Example: `"INP:IMP 75"`

Features: *RST value: 50
SCPI: conforming

Modes: A, VA

Switching the input impedance to 75 Ω includes the matching elements RAM or RAZ selected by the command `INPut:IMPedance:CORRection`.

INPut<1|2>:IMPedance:CORRection RAM | RAZ

This command selects the matching element for 75 Ω input impedance.

Example: `"INP:IMP:CORR RAM"`

Features: *RST value: - (INPut:IMPedance = 50 Ω)
SCPI: device-specific

Modes: A, VA

INPut<1|2>:MIXer -10 to -100 dBm

This command defines the nominal mixer level of the instrument.

Example: `"INP:MIX -30"`

Features: *RST value: -
SCPI: device-specific

Modes: A, VA

INPut:COUPling AC | DC

This command switches the input coupling of the RF input between A.C. and D.C.

Example: `"INP:COUP DC"`

Features: *RST value: AC
SCPI: conforming

Modes: E, A, VA

INPut<1|2>:GAIN:STATe ON | OFF

This command switches on the preamplifier for the receiver.

Example: `"INP:GAIN 20dB"`

Features: *RST value: OFF
SCPI: conforming

Mode: E

INPut<1|2>:GAIN:AUTO

This command includes the preamplifier into the autoranging function of the receiver.

Syntax: INPut<1|2>:GAIN:AUTO ON | OFF

Example: `"INP:GAIN:AUTO ON"`

Features: *RST value: OFF
SCPI: conforming

Mode: E

INPut<1|2>:TYPE INPUT1 | INPUT2

This command selects the type of input.

Example: `"INP:TYPE INPUT1"`

Features: *RST value: INPUT1
SCPI: conforming

Modes: E, A, VA

3.6.12 INSTrument Subsystem

The INSTrument subsystem selects the operating mode of the unit either via text parameters or fixed numbers. In the receiver mode, the suffix is not significant. In the analyzer and vector analyzer mode, a distinction is made between INSTrument1 (screen A) and INSTrument2 (screen B) in the split-screen representation.

COMMAND	PARAMETERS	UNIT	COMMENT
INSTrument<1|2>			
[:SELect]	SANalyzer | DDEMod | ADEMod | RECeiver		Vector Signal Analysis
:NSELect	<numeric_value>		
:COUPle	NONE | MODE | X | Y | CONTrol | XY | XCONtrol | YCONtrol | ALL		

INSTrument<1|2>[:SELect] RECeiver | DDEMod | ADEMod | SANalyzer

This command switches between the operating modes by means of text parameters.

Parameter:
RECeiver: receiver mode
SANalyzer: spectrum analysis
DDEMod: vector signal analysis, digital demodulation
ADEMod: vector signal analysis, analog demodulation

Example: `"INST DDEM"`

Features:
*RST value: RECeiver
SCPI: conforming

Modes: E, A, VA

Switchover to DDEMod or ADEMod is only possible in conjunction with option FSE-B7, Vector Signal Analysis.

INSTrument<1|2>:NSELect 1 | 2 | 3 | 6

This command switches between the two modes by means of numbers.

Example: `"INST:NSEL 2"`

Features:
*RST value: 6
SCPI: conforming

Modes: E, A, VA

6: receiver mode

1: spectrum analysis

2: vector signal analysis, digital demodulation

3: vector signal analysis, analog demodulation

Switchover to 2 or 3 is only possible in conjunction with option FSE-B7, Vector Signal Analysis.

INSTrument:COUPle NONE | MODE | X | Y | CONTrol | XY | XCONtrol | YCONtrol | ALL

This command defines the coupling between the two measurement windows screen A and B.

Example: `"INST:COUP NONE"`

Features: *RST value: ALL
SCPI: device specific

Modes: A, VA

NONE	no coupling.
MODE	the operating mode of the two screens is coupled.
X or Y	the scaling of the x- or y axis of the two screens is coupled.
CONTrol	the trigger and gate parameter ,and the sweep parameters SINGle/ CONTinous and COUNt of the two screens are coupled.
XY	the scaling of the x- and y-axis of the two screens are coupled.
XCONTrol or YCONTrol	the trigger and gate parameter, and the sweep parameters SINGle CONTinous/ COUNt of the two screens are coupled.
ALL	the scaling of the x- or y axis the trigger and gate parameter and the sweep parameters SINGle/ CONTinous/ COUNt of the two screens are coupled.

3.6.13 MMEMory Subsystem

The MMEMory (mass memory) subsystem provides commands which allow for access to the storage media of the instrument and for storing and loading various instrument settings.
The NAME command stores the HCOPy outputs in a file.

The various drives can be addressed via the mass storage unit specifier <msus> using the conventional DOS syntax. The internal hard disk is addressed by "C:", the floppy-disk drive installed by "A:".
The file names <file_name> are indicated as string parameters with the commands being enclosed in quotation marks. They correspond to the DOS conventions.

DOS file names consist of max. 8 ASCII characters and an extension of up to three characters separated from the file name by a colon "." Both, the colon and the extension are optional. The colon is not part of the file name. DOS file names do not differ between uppercase and lowercase notation. All letters and digits are permitted as well as the special characters "_", "^", "$", "~", "!", "#", "%", "&", "-", "{", "}", "(", ")", "@" and "`". Reserved file names are CLOCK$, CON, AUX, COM1 to COM4, LPT1 to LPT3, NUL and PRN.

The two characters "*" and "?" have the function of so-called "wildcards", i.e., they are variables for selection of several files. The question mark "?" replaces exactly one character which may be any, the asterisk means any of the remaining characters in the file name. "*.*" thus means all files in a directory.

COMMAND	PARAMETERS	UNIT	COMMENT
MMEMory			
:CATalog	<string>		
:CDIRectory	<directory_name>	--	
:COPY	<file_name>,<file_name>	--	no query
:DATA	<file name>[,<block>]	--	
:DELete	<file_name>	--	no query
:INITialize	<msus>	--	no query
:LOAD			
:STATe	1,<file_name>	--	no query
:AUTO	1,<file_name>	--	no query
:MDIRectory	<directory_name>	--	no query
:MOVE	<file_name>,<file_name>	--	no query
:MSIS	<msus>	--	
:NAME	<file_name>	--	
:RDIRectory	<directory_name>	--	no query
:STORe			
:STATe	1,<file_name>	--	no query
:CLEar			
:STATe	1,<file_name>	--	no query
:ALL			no query

COMMAND	PARAMETERS	UNIT	COMMENT
:SELect			
[:ITEM]			
:GSETup	<Boolean>		
:HWSettings	<Boolean>		
:TRACE<1 to 4>	<Boolean>		
:LINes			
[:ACTive]	<Boolean>		
:ALL	<Boolean>		
:CSETup	<Boolean>		
:HCOPy	<Boolean>		
:MACRos	<Boolean>		
:SCData	<Boolean>		Option Tracking Generator
:TRANsducer			
[:ACTive]	<Boolean>		
:ALL	<Boolean>		
:CVL			
[:ACTive]	<Boolean>		
:ALL	<Boolean>		
:ALL	--		no query
:NONE	--		no query
:DEFault	--		no query
:COMMent	<string>		

MMEMory:CATalog? <string>

This command is for read-out of the current directory. A mask, eg "*.bat", can be defined so that only files with "bat" as extension are selected.

Parameter: <string>::= DOS file name

Example: "`MMEM:CAT 'rem?.lin'`"

Characteristics: *RST value: -
SCPI: conformal

Modes: E, A, VA

MMEMory:CDIRectory <directory_name>

This command changes the current directory.

Parameter: <directory_name>::= DOS path name

Example: "`MMEM:CDIR 'C:\USER\DATA'`"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

In addition to the path name, the indication of the directory may contain the drive name. The path name complies with the DOS conventions.

MMEMory:COPY <file_source>,<file_destination>

This command copies the files indicated.

Parameter: <file_source>,<file_destination> ::= <file_name>
<file_name> ::= DOS file name

Example: "MMEM:COPY 'C:\USER\DATA\SETUP.CFG','A:'"

Features: *RST value: -
SCPI conforming

Modes: E, A, VA

The indication of the file name may include the path and the drive. The file names and path information must be in accordance with the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:DATA <file_name>[,<block data>]

This command writes block data to the specified file.

Syntax: MMEMory:DATA <file_name>,<block data>
MMEMory:DATA? <file_name>

Example: "MMEM:DATA? 'TEST01.HCP'"
"MMEM:DATA 'TEST01.HCP', #217This is the file"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

Each <block> starts with the character '#', followed by the value stating the length of the length information. This is followed by one or several characters for the length information; then come the data themselves. The end character must be set to EOI to ensure correct data transmission.

MMEMory:DELete <file_name>

This command deletes the files indicated.

Parameter: <file_name> ::= DOS file name

Example: "MMEM:DEL 'TEST01.HCP'"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

The indication of the file name contains the path and, optionally, the drive. Indication of the path corresponds to the DOS conventions. The file name includes indication of the path and may also include the drive. The path name corresponds to the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:INITialize 'A:'

This command formats the disk in drive A.

Example: "MMEM:INIT 'A:'"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

Formatting deletes all data stored on the floppy disk. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:LOAD:STATe 1,<file_name>

This command loads instrument settings from files.

Parameter: <file_name> ::= DOS file name without extension

Example: "MMEM:LOAD:STAT 1,'A:TEST'"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

The contents of the file is loaded and set as new instrument state. The file name includes indication of the path and may also include the drive. The path name corresponds to the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:LOAD:AUTO 1,<file_name>

This command defines which device setting is automatically loaded after the instrument is switched on.

Parameter: <file_name> ::= DOS file name without extension;
FACTORY denotes the data set previously in the instrument

Example: "MMEM:LOAD:AUTO 1,'C:\USER\DATA\TEST'"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

The contents of the file are read after switching on the instrument and used to define the new device state. The file name includes indication of the path and may also include the drive. The path name corresponds to the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:MDIRectory <directory_name>

This command creates a new directory.

Parameter: <directory_name>::= DOS path name

Example: "MMEM:MDIR 'C:\USER\DATA'"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

The file name includes indication of the path and may also include the drive. The path name corresponds to the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:MOVE <file_source>,<file_destination>

This command renames existing files.

Parameter: <file_source>,<file_destination> ::= <file_name>
<file_name> ::= DOS file name

Example: "MMEM:MOVE 'TEST01.CFG','SETUP.CFG'"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

The file name includes indication of the path and may also include the drive. The path name corresponds to the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:MSIS 'A:' | 'C:'

This command changes to the drive indicated.

Example: "MMEM:MSIS 'A:'"

Features: *RST value: "C:'
SCPI: conforming

Modes: E, A, VA

The drive may be the internal hard disk C: or the floppy-disk drive A:. The drive is indicated according to the DOS conventions.

MMEMory:NAME <file_name>

This command specifies a file which is printed or plotted to.

Parameter: <file_name> ::= DOS filename

Example: "MMEM:NAME 'PLOT1.HPG'"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

The file name includes indication of the path and may also include the drive. The file name and path information correspond to the DOS conventions. The output to the printer is routed into a file using the command "HCOP:DEST 'MMEM'".

MMEMory:RDIRectory <directory_name>

This command deletes the directory indicated.

Parameter: <directory_name>::= DOS path name

Example: "MMEM:RDIR 'C:\TEST'"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

The directory name includes indication of the path and may also include the drive. The path name corresponds to the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:STORe:STATe 1,<file_name>

This command stores the current instrument setting in a file.

Parameter: <file_name> ::= DOS file name without extension

Example: "MMEM:STOR:STAT 1,'TEST'"

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

The current instrument state is stored as a file. The file name includes indication of the path and may also include the drive. The path name corresponds to the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:CLEar:STATe 1,<file_name>

This command deletes the instrument setting denoted by <file_name>.

Parameter: <file_name> ::= DOS file name without extension

Example: "MMEM:CLE:STAT 1,'TEST'"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

The device data set specified is deleted. The file name includes indication of the path and may also include the drive. The path name corresponds to the DOS conventions. This command is an event which is why it is not assigned an *RST value and has no query.

MMEMory:CLEar:ALL

This command deletes all instrument settings in the current directory.

Example: "MMEM:CLE:ALL"

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

This command is an "event" which is why it is not assigned an *RST value and has no query.

MMEMory:SELect[:ITEM]:GSETup ON | OFF

This command includes the data of the general setup in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:GSET ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

MMEMory:SELect[:ITEM]:HWSettings ON | OFF

This command includes the hardware settings in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:HWS ON"

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

Level and frequency lines are stored with this command as well.

MMEMory:SELect[:ITEM]:TRACe<1 to 4> ON | OFF

This command includes the data of the selected trace in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:TRACE3 ON"

Features: *RST value: OFF for all Traces
SCPI: device-specific

Modes: E, A, VA

MMEMory:SELect[:ITEM]:LINes[:ACTive] ON | OFF

This command includes the active limit lines in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:LIN ON"

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

Upon MMEM:LOAD the limit lines which are not currently active but contained in the data set are restored as well.

MMEMory:SELect[:ITEM]:LINes:ALL ON | OFF

This command includes all limit lines in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:LIN:ALL ON"

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

This command includes selection of the active limit lines.

MMEMory:SELect[:ITEM]:CSETup ON | OFF

This command includes the current color setting in the list of partial datasets of a device setting to be stored/loaded.

Example: "MMEM:SEL:CSET ON"

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

MMEMory:SELect[:ITEM]:HCOPy ON | OFF

This command includes the hardcopy settings in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:HCOPy ON"

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

MMEMory:SELect[:ITEM]:MACRos ON | OFF

This command includes the keyboard macros in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:MACRos ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

MMEMory:SELect[:ITEM]:SCData ON | OFF

This command includes the tracking generator calibration data in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:SCData ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

This command only available in conjunction with the option Tracking Generator.

MMEMory:SELect[:ITEM]:TRANsducer[:ACTive] ON | OFF

This command includes the active transducer factors and set in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:TRAN ON"

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

Upon MMEM:LOAD the transducer factors and sets which are not currently active but contained in the data set are restored as well.

MMEMory:SELect[:ITEM]:TRANsducer:ALL ON | OFF

This command includes all transducer factors and sets in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:TRAN:ALL ON"

Features: *RST value: ON
SCPI: device-specific

Modes: E, A, VA

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

MMEMory:SELect[:ITEM]:CVL[:ACTive] ON | OFF

This command includes the active conversion loss table into the list of data subrecords to be stored / loaded for a device setup.

Example: "MMEM:SEL:CVL ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

With MMEM:LOAD, inactive conversion loss tables too are restored if they are included in the data record.

MMEMory:SELect[:ITEM]:CVL:ALL ON | OFF

This command includes all conversion loss tables into the list of data subrecords to be stored / loaded for a device setup.

Example: "MMEM:SEL:CVL:ALL ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

MMEMory:SELect[:ITEM]:ALL

This command includes all data subsets in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:ALL"

Features: *RST value: --
SCPI: device-specific

Modes: E, A, VA

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

MMEMory:SELect[:ITEM]:NONE

This command deletes all data subsets in the list of data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:NONE"

Features: *RST value: --
SCPI: device-specific

Modes: E, A, VA

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

MMEMory:SELect[:ITEM]:DEFault

This command sets the default list of the data subsets of a device setting to be stored/loaded.

Example: "MMEM:SEL:DEFault"

Features: *RST value: --
SCPI: device-specific

Modes: E, A, VA

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

MMEMory:COMMent <string>

This command defines a comment for a device setting to be stored.

Example: "MMEM:COMM 'Setup for GSM measurement'"

Features: *RST value: blank comment
SCPI: device-specific

Modes: E, A, VA

3.6.14 OUTPut Subsystem

The OUTPut subsystem checks the output features of the instrument.
In conjunction with option tracking generator, in the split screen mode, a distinction is made between OUTPut1 (screen A) and OUTPut2 (screen B).

COMMAND	PARAMETERS	UNIT	COMMENT
OUTPut<1|2>			
[:STATe]	<boolean>	--	Option Tracking Generator
:UPORt<1|2>			
[:VALue]	<binary>	--	
:STATe	<boolean>	--	
:AF			
:SENSitivity	<numeric_value	PCT | HZ | KHZ | DEG | RAD	Vector Signal Analysis

OUTPut<1|2>[:STATe] ON | OFF

This command switches the tracking generator on or off.

Example: `"OUTP ON"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

This command is only valid in conjunction with one of the options tracking generator.

OUTPut:UPORt<1|2>[:VALue #B00000000 to #B11111111

This command sets the control lines of the user ports.

Example: `"OUTP:UPOR2 #B10100101"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

User port 1 or 2 is written with the given binary pattern. If the user port is programmed to INPut instead of OUTPut, the output value is temporarily stored.

OUTPut:UPORt<1|2>:STATe ON | OFF

This command switches the control line of the user ports between INPut and OUTPut.

Example: `"OUTP:UPOR:STAT ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A, VA

With ON, the user port is switched to OUTPut, with OFF to INPut.

OUTPut:AF:SENSitivity <numeric_value>

This command changes the sensitivity of the AF-output.

Parameter: <numeric_value> ::= 0.1 PCT to 100 PCTfor AM
0.1 KHZ to 100 KHZfor FM
0.0 1RAD to 10 RADfor PM

Example: `"OUTP:AF:SENS 20PCT"`

Features: *RST value: 100 % for AM
100 kHz for FM
10 rad for PM
SCPI: device-specific

Mode: VA-A

3.6.15 SENSe Subsystem

The SENSe subsystem is itself divided up into several subsystems. The commands of these subsystems directly control device-specific settings, they do not refer to the signal characteristics of the measurement signal.
The SENSe subsystem controls the essential parameters of the analyzer and vector analyzer. In accordance with the SCPI standard, it is for this reason optional, which means that it is not necessary to include the SENSe node in command sequences.

3.6.15.1 SENSe:ADEMod Subsystem

It is active only in conjunction with option Vector Signal Analysis, FSE-B7.

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe<1|2>]			
:ADEMod			option Vector Signal Analysis
:AF			
:COUPling	AC | DC		
:SQUelch			
[:STATe]	<Boolean>		
:LEVel	<numeric_value>	DBM	
:SBANd	NORMal | INVerse		
:RTIMe	<Boolean>		

[SENSe:]ADEMod:AF:COUPling AC | DC

This command selects coupling of the AF-branch.

Example: "ADEM:AF:COUP DC"

Features: *RST value: AC
SCPI: device-specific

Mode: VA-A

[SENSe:]ADEMod:SQUelch[:STATe] ON | OFF

This command switches the squelch for the audio branch on or off.

Example: "ADEM:SQU ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: VA-A

[SENSe:]ADEMod:SQUelch:LEVel 30 to -150 dBm

This command defines the switching threshold for the squelch referred to the measured signal.

Example: `"ADEM:SQU -10DBM"`

Features: *RST value: -40dBm
SCPI: device-specific

Mode: VA-A

[SENSe:]ADEMod:SBANd NORMal | INVerse

This command selects the side band for the demodulation.

Example: `"ADEM:SBAN INV"`

Features: *RST value: NORMal
SCPI: device-specific

Mode: VA-A

[SENSe:]ADEMod:RTIMe ON | OFF

This command selects whether the demodulation performed in real time or in blocks.

Example: `"ADEM:RTIM ON"`

Features: *RST value: ON
SCPI: device-specific

Mode: VA-A

3.6.15.2 [SENSe:]AVERage Subsystem

The [SENSe:]AVERage subsystem calculates the average of the data acquired. A new test result is obtained from various successive measurements. The amount of test points and the axis reference of the new result correspond to those of the original measurements.

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:AVERage			
:COUNt	<numeric_value>	--	
:AUTO	<Boolean>	--	
[:STATe]	<Boolean>	--	
:TYPE	MAXimum | SCALar	--	

[SENSe:]AVERage:COUNt 0 to 32767

The command specifies the number of measurements which are combined.

Example: "AVER:COUN 16"

Features: ***RST value:** 0
SCPI: conforming

Modes: E, A. VA-D

[SENSe:]AVERage:COUNt:AUTO ON | OFF

AUTO ON selects a suitable number of :COUNt for the respective type of measurement.

Example: "AVER:COUN:AUTO ON"

Features: *RST value: OFF
SCPI: conforming

Modes: E, A. VA-D

[SENSe:]AVERage[:STATe] ON | OFF

The command switches on or off the average function.

Example: "AVER OFF"

Features: ***RST value:** OFF
SCPI: conforming

Modes: E, A, VA

[SENSe:]AVERage:TYPE MAXimum | SCALar

The command selects the type of average function.

Example: "AVER:TYPE SCAL"

Features: ***RST value:** SCALar
SCPI: conforming

Modes: E, A, VA

The following average functions have been defined:

MAXimum: $AVG(n) = MAX(X_1 \text{ to } .X_n)$

SCALar: $$AVG(n) = \frac{1}{n} \times \sum_{i=1}^{n} xi$$

3.6.15.3 SENSe:BANDwidth Subsystem

This subsystem controls the setting of the instrument's filter bandwidths. Both groups of commands (BANDwidth and BWIDth) perform the same functions.

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:BANDwidth			
[:RESolution]	<numeric_value>	HZ	
:AUTO	<Boolean>	--	
:MODE	ANALog|DIGital	--	
:FFT	<Boolean>	--	option FFT Filter
:RATio	<numeric_value>	--	
:VIDeo	<numeric_value>	HZ	
:AUTO	<Boolean>	--	
:RATio	<numeric_value> | SINe | PULSe | NOISe	--	
:DEMod	<numeric_value>	HZ	option Vector Signal Analysis
:PLL	AUTO | HIGH | MEDium | LOW		
:BWIDth			
[:RESolution]	<numeric_value>	HZ	
:AUTO	<Boolean>	--	
:MODE	ANALog|DIGital	--	
:FFT	<Boolean>	--	option FFT Filter
:RATio	<numeric_value>	--	
:VIDeo	<numeric_value>	HZ	
:AUTO	<Boolean>	--	
:RATio	<numeric_value> | SINe | PULSe | NOISe	--	
:DEMod	<numeric_value>	HZ	option Vector Signal Analysis
:PLL	AUTO | HIGH | MEDium | LOW		

[SENSe:]BANDwidth|BWIDth[:RESolution] 1 Hz to 10 MHz

This command defines the IF bandwidth (6-dB bandwidth) of the receiver or resolution bandwidth of the analyzer.

Example: `"BAND 1MHz"`

Features: *RST value: - (AUTO is set to ON)
SCPI: conforming

Modes: E, A, VA

In the receiver mode, ESI offers the IF bandwidths (6 dB bandwidths) 10 Hz, 100 Hz, 200 Hz, 1 kHz, 9 kHz, 10 kHz, 100 kHz, 120 kHz, 1 MHz and 10 MHz. The IF filters up to 1 kHz are digital Gauss filters. They behave like analog filters.The 9 kHz and 10 kHz bandwidths are obtained by decoupled crystal filters and the bandwidths between 100 kHz and 1 MHz by decoupled LC filters. These filters contain 5 filter circuits. The 10 MHz filter is a critically coupled LC filter

In the analyzer and vector analyzer mode, the values for the resolution bandwidth are rounded in 1 | 2 | 3 | 5 steps. Bandwidths >1kHz are always analog bandwidths, bandwidths <1kHz are always realized digitally. For the bandwidth 1kHz, it is possible to select either analog or digital filters.

[**SENSe:]BANDwidth|BWIDth[:RESolution]:AUTO** ON | OFF

This command either automatically couples the resolution bandwidth of the instrument to the span or cancels the coupling.

Example: `"BAND:AUTO OFF"`

Features: *RST value: ON
SCPI: conforming

Modes: A. VA

The automatic coupling matches the resolution bandwidth to the currently set span according to the relationship between span and resolution bandwidth.

[SENSe:]BANDwidth|BWIDth[:RESolution]:MODE ANALog | DIGital

This command toggles between analog and digital resolution filters for the 1-kHz bandwidth.

Example: `"BAND:MODE DIG"`

Features: *RST value: ANALog
SCPI: device-specific

Mode: A

Depending on the bandwidth, the resolution filters are automatically toggled between digital filters (<1kHz) and analog filters (>1kHz). The 1-kHz bandwidth is present in the instrument as a digital filter and as an analog filter and can be toggled using this command. If the analog filter is selected for the bandwidth 1kHz, the FFT-filtering for bandwidths ≤ 1kHz is switched off.

[SENSe:]BANDwidth|BWIDth[:RESolution]:MODE:FFT ON | OFF

This command toggles the digital filters used for bandwidths ≤ 1 kHz between ordinary mode and FFT-filter mode.

Example: `"BAND:MODE:FFT ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: A

The filter bandwidth of 1 kHz is switched to digital filtering for both ON and OFF. This command is only available in conjunction with option FFT Filter.

[SENSe:]BANDwidth|BWIDth[:RESolution]:RATio 0.0001 to 1

This command defines the ratio resolution bandwidth (Hz) / span (Hz).).

Example: `"BAND:RAT 0.1"`

Features: *RST value: -- (AUTO is set to ON)
SCPI: conforming

Modes: A. VA, E

The ratio to be entered is reciprocal to the ratio Span/RBW used in manual control.

[SENSe:]BANDwidth|BWIDth:VIDeo 1Hz to 10MHz

This command defines the instrument's video bandwidth.

Example: `"BAND:VID 10kHz"`

Features: *RST value: - (AUTO is set to ON)
SCPI: conforming

Mode: A

The values for the video bandwidth are rounded in 1 | 2 | 3 | 5 steps.

[SENSe:]BANDwidth|BWIDth:VIDeo:AUTO ON | OFF

This command either automatically couples the instrument's video bandwidth to the resolution bandwidth or cancels the coupling.

Example: `"BAND:VID:AUTO OFF"`

Features: *RST value: ON
SCPI: conforming

Mode: A

[SENSe:]BANDwidth|BWIDth:VIDeo:RATIO 0.001to 1000 | SINe | PULSe | NOISe

This command defines the ratio video bandwidth (Hz) / resolution bandwidth (Hz).

Parameter: The parameters SINe, PULSe and NOISe may be used as synonyms for the following values:
SINe: 1
PULSe: 10
NOISe: 0.1

Example: `"BAND:VID:RAT 10"`

Features: *RST value: - (AUTO is set to ON)
SCPI: conforming

Modes: A. VA

The ratio to be entered is reciprocal to the ratio RBW/VBW used in manual control.

[SENSe:]BANDwidth|BWIDth:DEMod 5kHz to 200kHz (Real Time on) | 5kHz to 5MHz (Real Time off)

This command defines the demodulation bandwidth of the instrument for analog demodulation.

Example: `"BAND:DEM 100KHZ"`

Features: *RST value: 10KHZ
SCPI: device-specific

Mode: VA-A

The values for the demodulation bandwidth are rounded in steps of 1 | 2 | 3 | 5.

[SENSe:]BANDwidth|BWIDth:PLL AUTO | HIGH | MEDium | LOW

This command defines the bandwidth of the main PLL of the instrument synthesizer.

Example: `"BAND:PLL HIGH"`

Features: *RST value: AUTO
SCPI: device-specific

Mode: A

3.6.15.4 SENSe:CORRection-Subsystem

The SENSe:CORRection-subsystem controls the correction of measured results by means of frequency-dependent correction factors (e. g. for antenna or cable attenuation).
It also controls calibration and normalization during operation with the option Tracking Generator .

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:CORRection			option Tracking Generator
:METHod	TRANsmission | REFLexion		
:COLLect			
[:ACQuire]	THRough | OPEN		no query
[:STATe]	<Boolean>		
:RECall			no query
:TRANsducer			
:SELect	<name>		
:UNIT	<string>		
:SCALing	LINear | LOGarithmic		
:DATA	<freq> , <level> ..	HZ , --	
[:STATe]	<Boolean>		
:DELete	--	--	no query
:TSET			
:SELect	<name>		
:UNIT	<string>		
:BREak	<Boolean>		
:RANGe<1 to 10>	<freq> , <freq>, <name> ..	HZ, HZ, --	
[:STATe]	<Boolean>		
:DELete	--	--	no query
:CVL			option external mixer output
:SELect	<file_name>		
:MIXer	<string>		
:SNUMber	<string>		
:BAND	A|Q|U|V|E|W|F|D|G|Y|J		
:TYPE	ODD | EVEN | EODD		
:PORTs	2 | 3		
:BIAS	<numeric_value>	A	
:COMMent	<string>		
:DATA	<freq> , <level> ..	HZ , DB	
:CLEar	--	--	no query

[SENSe:]CORRection[:STATe] ON | OFF

This command activates/deactivates normalization of the measurement results.

Example: `"CORR ON "`

Features: *RST value: OFF
SCPI: conforming

Mode: A

This command is only valid in conjunction with option Tracking Generator.

[SENSe:]CORRection:METHod TRANsmission | REFLexion

This command selects the kind of measurement with active tracking generator (transmission/reflexion).

Example: "CORR:METH TRAN "

Features: *RST value: TRANsmission
SCPI: device specific

Mode: A

This command is only valid in conjunction with option Tracking Generator.

[SENSe:]CORRection:COLLect[:ACQuire] THRough | OPEN

This command selects the kind of measurement for the reference values of the normalization (response calibration).

Example: "CORR:COLL THR"

Features: *RST value:
SCPI: conforming

Mode: A

THRough "TRANsmission" mode: calibration with direct connection between tracking generator and device input.
"REFLexion" mode: calibration with short circuit at the input

OPEN only valid in "REFLexion" mode:calibration with open input

This command is an event which is why it is not assigned an *RST value an a query. It is only valid in conjunction with option Tracking Generator.

[SENSe:]CORRection:RECall

This command restores the instrument setting that was valid for the measurement of the reference data. It is only valid in conjunction with option Tracking Generator.

Example: "CORR:REC"

Features: *RST value: -
SCPI: conforming

Mode: A

This command is an event which is why it is not assigned an *RST value and a query. It is only valid in conjunction with option Tracking Generator.

[SENSe:]CORRection:TRANsducer:SELect <name>

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

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

Example: `"CORR:TRAN:SEL 'FACTOR1'"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A

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

[SENSe:]CORRection:TRANsducer:UNIT <string>

This command defines the unit of the transducer factor selected.

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

Example: `"CORR:TRAN:UNIT 'DBUV'"`

Features: *RST value: 'DB'
SCPI: device-specific

Modes: E, A

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

[SENSe:]CORRection:TRANsducer:SCALing LINear | LOGarithmic

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

Example: `"CORR:TRAN:SCAL LOG"`

Features: *RST value: LINear
SCPI: device-specific

Modes: E, A

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

[SENSe:]CORRection:TRANsducer:DATA <freq>,<level>..

This command defines the test points for the selected transducer factor. The values are entered as a series of frequency/level pairs. The frequencies must be in ascending order.

Example: `"CORR:TRAN:TRANsducer:DATA 1MHZ,-30,2MHZ,-40"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A

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.`

[SENSe:]CORRection:TRANsducer[:STATe] ON | OFF

This command switches the selected transducer factor on or off.

Example: "CORR:TRAN ON"

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A

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

[SENSe:]CORRection:TRANsducer:DELete

This command deletes the selected transducer factor.

Example: "CORR:TRAN:DEL"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event and therefore has no *RST value.
Prior to this command, the command SENS:CORR:TRAN:SEL must be sent.

[SENSe:]CORRection:TSET:SELect <name>

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

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

Example: "CORR:TSET:SEL 'SET1'"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command must be sent prior to the subsequent commands for changing/activating the transducer sets.

[SENSe:]CORRection:TSET:UNIT <string>

This command defines the unit of the selected transducer sets. When assigning transducer factors to the set, only factors which are compatible to the selected unit, i. e. factors with the same unit or the unit dB, are allowed.

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

Example: `"CORR:TSET:UNIT 'DBUV'"`

Features: *RST value: 'DB'
SCPI: device-specific

Modes: E, A

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

[SENSe:]CORRection:TSET:BREak ON | OFF

This command defines if the sweep is to be stopped on changeover from range to another.

Example: `"CORR:TSET:BRE ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A

Prior to the above command, the command `SENS:CORR:TSET:SEL` must be sent.

[SENSe:]CORRection:TSET:RANGe<1 to 10> <freq>,<freq>,<name>..

This command defines a partial range of the selected transducer set. The partial range is determined by its start and stop frequencies plus a list of names of the assigned transducer factors. The ranges 1 to 10 must be sent in ascending order.

Parameter: <freq>,<freq>::= start frequency, stop frequency of the range
<name>...::= list of names for the assigned transducer factors. The individual names must be characterized by single quotation marks (') and separated by commas.

Example: `"CORR:TRAN:TSET:RANG 1MHZ,2MHZ,'FACTOR1,'FACTOR2'"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A

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

[SENSe:]CORRection:TSET[:STATe] ON | OFF

This command switches the selected transducer set on or off.

Example: `"CORR:TSET ON"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A

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

[SENSe:]CORRection:TSET:DELete

This command deletes the selected transducer set.

Example: "CORR:TSET:DEL"

Features: *RST value: -
SCPI: device-specific

Modes: E, A

This command is an event and thus has no *RST value assigned.
Prior to this command, the command SENS:CORR:TSET:SEL must be sent.

[SENSe:]CORRection:CVL:SELect <file_name>

This command selects the Conversion Loss Table designated with <file_name>. If <file_name> is not available, a new Conversion Loss Table will be created.

Parameter: <file_name>::= Name of Conversion Loss Table as string data with a maximum of 8 characters

Example: "CORR:CVL:SEL 'LOSS_TAB'"

Features: *RST value: -
SCPI: device-specific

Mode: A

This command must be sent prior to the subsequent commands used to change/activate the Conversion Loss files.

[SENSe:]CORRection:CVL:MIXer <string>

This command defines the type designation of the mixer in the Conversion Loss Table.

Parameter: <string>::= Type designation of mixer with a maximum of 16 characters

Example: "CORR:CVL:MIX 'FSE_Z60'"

Features: *RST value: -
SCPI: device-specific

Mode: A

Command SENS:CORR:CVL:SEL must be sent prior to this command.

[SENSe:]CORRection:CVL:SNUMber <string>

This command defines the serial number of the mixer in the Conversion Loss Table.

Parameter: <string>::= Serial number of mixer with a maximum of 16 characters

Example: "CORR:CVL:SNUM '123.4567'"

Features: *RST value: -
SCPI: device-specific

Mode: A

Command SENS:CORR:CVL:SEL must be sent prior to this command.

[SENSe:] CORRection: CVL:BAND A|Q|U|V|E|W|F|D|G|Y|J

This command defines the waveguide band in the Conversion Loss Table.

Example: "CORR:CVL:BAND E"

Features: *RST value: -
SCPI: device-specific

Mode: A

Command SENS:CORR:CVL:SEL must be sent prior to this command.

[SENSe:]CORRection:CVL:TYPE ODD | EVEN | EODD

This command defines the type of harmonic in the Conversion Loss Table.

Example: "CORR:CVL:TYPE EODD"

Features: *RST value: -
SCPI: device-specific

Mode: A

Command SENS:CORR:CVL:SEL must be sent prior to this command.

[SENSe:]CORRection:CVL:PORTs 2 | 3

This command defines the type of mixer in the Conversion Loss Table.

Example: "CORR:CVL:PORT 3"

Features: *RST value: -
SCPI: device-specific

Mode: A

Command SENS:CORR:CVL:SEL must be sent prior to this command.

[SENSe:]CORRection:CVL:BIAS <numeric_value>

This command defines the bias current in the Conversion Loss Table.

Example: "CORR:CVL:BIAS 7mA"

Features: *RST value: -
SCPI: device-specific

Mode: A

Command SENS:CORR:CVL:SEL must be sent prior to this command.

[SENSe:]CORRection:CVL:COMMent <string>

This command defines the comment in the Conversion Loss Table.

Parameter: <string>::= Comment of mixer with a maximum of 60 characters

Example: "CORR:CVL:COMMENT 'MIXER FOR BAND U'"

Features: *RST value: -
SCPI: device-specific

Mode: A

Command SENS:CORR:CVL:SEL must be sent prior to this command.

[SENSe:]CORRection:CVL:DATA <freq>,<level>..

This command defines the reference values of the selected Conversion Loss Tabels. The values are entered as a result of frequency/level pairs. The frequencies have to be sent in ascending order.

Example: `"CORR:CVL:DATA 1MHZ,-30DB,2MHZ,-40DB"`

Features: *RST value: -
SCPI: device-specific

Mode: A

Command `SENS:CORR:CVL:SEL` must be sent prior to this command.

[SENSe:]CORRection:CVL:CLEar

This command deletes the selected Conversion Loss Table.

Example: `"CORR:CVL:CLE"`

Features: *RST value: -
SCPI: device-specific

Mode: A

This command is an event which is why it is not assigned an *RST value.
Command `SENS:CORR:CVL:SEL` must be sent prior to this command.

3.6.15.5 SENSe:DEMod Subsystem

The SENSe:DEMod subsystem controls the analog demodulation of the video signal.

COMMAND	PARAMETER	UNIT	COMMENT
[SENSe] :DEMod	OFF | AM | FM		

[SENSe:]DEMod OFF | AM | FM

This command selects the type of analog demodulation.

Example: `"DEM FM"`

Features: *RST value: OFF
SCPI: device-specific

Modes: E, A

3.6.15.6 SENSe:DETector Subsystem

The SENSe:DETector subsystem controls the recording of measurement values via the type of detector selected for each trace.

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:DETector<1to4>			
[:FUNCtion]	APEak | NEGative| POSitive | SAMPle| RMS | AVERage | QPEak		
:AUTO	<Boolean>	--	
:RECeiver			
[:FUNCtion]	POSitive | RMS | AVERage | QPEak POSitive|RMS|AVERage|QPEak ..		

[SENSe:]DETector<1 to 4>[:FUNCtion] APEak | NEGative | POSitive| SAMPle |RMS | AVERage | QPEak

This command switches the detector for recording of the measured value.

Example: `"DET POS"`

Features: *RST value: POS
SCPI: conforming

Modes: E, A

In scan mode of the receiver, the detectors POSitive, RMS, AVERage and QPEak are available.

In the analyzer mode, all detectors are available except for QPEak. The value "APEak" (AutoPeak) displays both the positive peak value and the negative peak value when noise is present. The positive peak value is displayed when one signal is present. The trace is selected by means of the numeric suffix after DETector.

[SENSe:]DETector<1 to 4>[:FUNCtion]:AUTO ON | OFF

This command either couples the detector to the current trace setting or turns coupling off.

Example: `"DET:AUTO OFF"`

Features: *RST value: ON
SCPI: conforming

Mode: A

The trace is defined by the numeric suffix at DETector.

[SENSe:]DETector:RECeiver[:FUNCtion] POSitive | RMS | AVERage | QPEak

This command switches on the detectors for single measurements.
The trace is not selectable; all four detectors may be switched on simultaneously.

Example: `"DET:REC POS,AVER,QPE"`

Features: *RST value: POS
SCPI: device-specific

Mode: E

The trace is defined by the numeric suffix at DETector.

3.6.15.7 SENSe:DDEMod Subsystem

This subsystem controls the parameters for digital demodulation.
It is only active in conjunction with operating mode Vector Signal Analysis (option FSE-B7).

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:DDEMod			Vector Signal Analysis
:FORMat	QPSK | PSK | MSK | QAM | FSK		
:SBANd	NORMal | INVerse		
:QPSK			
:FORMat	NORMal | DIFFerential | OFFSet | DPI4		
:PSK			
:NSTate	2 | 8		
:FORMat	NORMal | DIFFerential		
:MSK			
:FORMat	TYPE1 | TYPE2 | NORMal | DIFFerential		
:QAM			
:NSTate	16		
:FSK			
:NSTate	2 | 4		
:SRATe	<numeric_value>	HZ	
:TIMe	<numeric_value>	SYM	
:PRATe	1 | 2 | 4 | 8 | 16		
:FILTer			
:MEASurement	OFF | RCOSine | RRCosine | GAUSsian		
:REFerence	RCOSine | RRCosine | GAUSsian		
:ALPHa	<numeric_value>		
:NORMalize	<Boolean>		
:PRESet	GSM | TETRa | DCS1800 | PCS1900 | PHS | PDCup | PDCDown | APCO25CQPSK | APCO25C4FM | CDPD | DECT | CT2 | ERMes | MODacom | PWT | TFTS | F16 | F322 | F324 | F64 | FQCDma | RQCDma | FNADc | RNADc		
:SEARch			
:PULSe			
:STATe	<Boolean>		
:SYNC			
:OFFSet	<numeric_value>	SYM	
:PATTern	<string>		
:STATe	<Boolean>		
:TIME	<numeric value>	SYM	
:TCAPture			Vector Signal Analysis
:LENGth	<numeric_value>		

[SENSe:]DDEMod:FORMat QPSK | PSK | MSK | QAM | FSK

This command selects the digital demodulation type.

Example: `"DDEM:FORM QPSK"`

Features: *RST value: MSK
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:SBANd NORMal | INVerse

This command selects the sideband for the demodulation.

Example: `"DDEM:SBAN INV"`

Features: *RST value: NORMal
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:QPSK:FORMat NORMal | DIFFerential | OFFSet | DPI4

This command determines the specific demodulation type for QPSK.

Example: `"DDEM:QPSK:FORM DPI4"`

Features: *RST value: -
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:PSK:NSTate 2 | 8

This command determines the specific demodulation type for PSK.

Example: `"DDEM:PSK:NST 2"`

Features: *RST value: -
SCPI: device-specific

Mode: VA-D

Value 2 (i.e. PSK2) corresponds to BPSK demodulation, value 8 the 8PSK demodulation.

[SENSe:]DDEMod:PSK:FORMat NORMal | DIFFerential

This command determines the specific demodulation type for PSK.

Example: `"DDEM:PSK:FORM DIFF"`

Features: *RST value: -
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:MSK:FORMat TYPE1 | TYPE2 | NORMal | DIFFerential

This command determines the specific demodulation type for MSK.

Example: `"DDEM:MSK:FORM TYPE2"`

Features: *RST value: TYPE2 | DIFFerential
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:QAM:NSTate 16

This command determines the specific demodulation type for QAM.

Example: `"DDEM:QAM:NST 16"`

Features: *RST value: 16
SCPI: device-specific.

Mode: VA-D

[SENSe:]DDEMod:FSK:NSTate 2 | 4

This command determines the specific demodulation type for FSK.

Example: `"DDEM:FSK:NST 2"`

Features: *RST- value: -
SCPI: device-specific

Mode: VA-D

The parameter 2 corresponds to the demodulation type 2FSK, the parameter 4 to the demodulation type 4FSK.

[SENSe:]DDEMod:SRATe 160 Hz ...1.6 MHz

This command defines the symbol rate.

Example: `"DDEM:SRAT 18kHz"`

Features: *RST value: 270.833333kHz
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:TIME 1 to Frame Length

The command determines the number of displayed symbols (result length).

Example: `"DDEM:TIME 80"`

Features: *RST value: 147
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:PRATe 1 | 2 | 4 | 8 | 16

This command determines the number of points per symbol.

Example: `"DDEM:PRAT 8"`

Features: *RST value: 4
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:FILTer:MEASurement OFF | RCOSine | RRCosine | GAUSsian

This command selects the input filter for the test signal.

Example: `"DDEM:FILT:MEAS RCOS"`

Features: *RST value: OFF
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:FILTer:REFerence RCOSine | RRCosine | GAUSsian

This command selects the input filter for the reference signal.

Example: `"DDEM:FILT:REF RCOS"`

Features: *RST value: GAUSsian
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:FILTer:ALPHa 0.2 to 1

This command determines the filter characteristic (ALPHA/BT). Step width is 0.05.

Example: `"DDEM:FILT:ALPH 0.5"`

Features: *RST value: 0.3
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:NORMalize ON | OFF

This command switches normalizing of the unit circle on or off using IQ offset.

Example: `"DDEM:NORM OFF"`

Features: *RST value: ON
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:SEARch:PULSe:STATe ON | OFF

This command switches the signal burst search on or off.

Example: `"DDEM:SEAR:PULS:STAT OFF"`

Features: *RST value: ON
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:SEARch:SYNC:OFFSet <numeric_value>

This command defines the offset of the display with reference to the synchronization sequence.

Example: `"DDEM:SEAR:SYNC:OFFS 10SYM"`

Features: *RST value: 0 SYM
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:SEARch:SYNC:PATTern <string>

This command defines the synchronization sequence.

Example: `"DDEM:SEAR:SYNC:PATT "1101001"`

Features: *RST value: ""
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:SEARch:SYNC:STATe ON | OFF

This command switches the search for a synchronization sequence on or off.

Example: `"DDEM:SEARch:SYNC:STAT ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:SEARch:TIME 100 to 1600

This command determines the number of symbols required for demodulation (frame length). The values > 800 are only permissible if the number of points per symbol is <16, the values > 1600 only if the number of points per symbol is <8. Step width is 100.

Example: `"DDEM:SEAR:TIME 800"`

Features: *RST value: 400
SCPI: device-specific

Mode: VA-D

[SENSe:]DDEMod:PRESet GSM | TETRa | DCS1800 | PCS1900 |PHS | PDCup | PDCDown | APCO25CQPSK | APCO25C4FM | CDPD | DECT | CT2 | ERMes | MODacom | PWT | TFTS | F16 | F322 | F324 | F64 |FQCDma | RQCDma | FNADc | RNADc

This command selects an automatic setting of all modulation parameters according to a standard transmission method.

Example: `"DDEM:PRES TETR"`

Features: *RST value: GSM
SCPI: device-specific

Mode: VA-D

APCO25CQPSK	APCO25 Continous Phase QPSK
APCO25C4FM	APCO25 Continous Phase 4FM
F16	FLEX 1600 - 2FSK
F322	FLEX 3200 - 2FSK
F324	FLEX 3200 - 4FSK
F64	FLEX 6400 - 4FSK
FNADc	Forward NADC
RNADc	Reverse NADC
FQCDma	Forward CDMA according to IS95 standard
RQCDma	Reverse CDMA according to IS95 standard

[SENSe:]TCAPture:LENGth 1024 | 2048 | 4096 | 8192 | 16384

This command determines the number of sampling points that are written into the memory for each measurement (memory size).

Example: `"TCAP:LENG 1024"`

Features: *RST value: 16384
SCPI: device-specific

Mode: VA-D

3.6.15.8 SENSe:FILTer Subsystem

The SENSe:FILTer subsystem selects the filters in the video signal path.
This subsystem is active only in the Vector Signal Analysis mode (option FSE-B7).

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:FILTer			Vector Signal Analyzer
:HPASs			
[:STATe]	<Boolean>	--	
:FREQuency	<numeric_value>	HZ	
:LPASs			Vector Signal Analyzer
[:STATe]	<Boolean>	--	
:FREQuency	<numeric_value>	HZ | PCT	
:CCITt			
[:STATe]	<Boolean>	--	
:CMESsage			
[:STATe]	<Boolean>	--	
:DEMPhasis			
[:STATe]	<Boolean>		
:TCONstant	<numeric_value>	S	
:LINK	DISPlay | AUDio		

[SENSe:]FILTer:HPASs[:STATe] ON | OFF

This command activates the high-pass filter in the AF-branch for analog demodulation.

Example: `"FILT:HPAS ON"`

Features: *RST value: OFF
SCPI: conforming

Mode: VA-A

[SENSe:]FILTer:HPASs:FREQuency 30 Hz | 300 Hz

In the Vector Signal Analysis mode with analog demodulation, this command defines the frequency limit of the high-pass filter in the AF-branch. For REAL TIME ON absolute frequencies are entered, for REAL TIME OFF, the frequencies are entered relative to the demodulation bandwidth.

Example: `"FILT:HPAS:FREQ 300HZ"`

Features: *RST value: - (STATe = OFF)
SCPI: conforming

Mode: VA-A

[SENSe:]FILTer:LPASs[:STATe] ON | OFF

This command activates the low-pass filter in the AF-branch with analog demodulation.

Example: `"FILT:LPAS ON"`

Features: *RST value: OFF
SCPI: conforming

Mode: VA-A

On switching to ON, a bandwidth of 3 kHz for REAL TIME ON and a bandwidth of 5 PCT for REAL TIME OFF is set automatically.

[SENSe:]FILTer:LPASs:FREQuency <numeric_value>

This command defines the frequency limit of the low-pass filter in the NF-branch for analog demodulation.

Parameter: <numeric_value> ::= 3 kHz | 15 kHz for REAL TIME ON
5 PCT | 10 PCT | 25 PCT for REAL TIME OFF

Example: "`FILT:LPAS:FREQ 3KHZ`" for REAL TIME ON
"`FILT:LPAS:FREQ 25PCT`" for REAL TIME OFF

Features: *RST value: - (STATe = OFF)
SCPI: conforming

Mode: VA-A

[SENSe:]FILTer:CCITt[:STATe] ON | OFF

This command activates the weighting filter according to CCITT-recommendation in the AF-branch for analog demodulation.

Example: `"FILT:CCIT ON"`

Features: *RST value: OFF
SCPI: conforming

Mode: VA-A

[SENSe:]FILTer:CMESsage[:STATe] ON | OFF

This command activates the C-message weighting filter according to CCITT-recommendation in the AF-branch for analog demodulation.

Example: `"FILT:CMES ON"`

Features: *RST value: OFF
SCPI: conforming

Mode: VA-A

This command is valid only with REAL TIME OFF.

[SENSe:]FILTer:DEMPhasis[:STATe] ON | OFF

This command activates the selected de-emphasis for analog demodulation.

Example: `"FILT:DEMP ON"`

Features: *RST value: OFF
SCPI: conforming

Mode: VA-A

[SENSe:]FILTer:DEMPhasis:TCONstant 50US | 75US | 750US

This command sets the time constant of the de-emphasis for analog demodulation.

Example: `"FILT:DEMP:TCON 75US"`

Features: *RST value: 50us
SCPI: conforming

Mode: VA-A

[SENSe:]FILTer:DEMPhasis:LINK DISPlay | AUDio

For analog demodulation, this command selects whether the de-emphasis set is to be active in the audio branch only or in addition for the display of measured values.

Example: `"FILT:DEMP:LINK DISP"`

Features: *RST value: AUDio
SCPI: device-specific

Mode: VA-A

AUDio De-emphasis effective in the audio branch only
DISPlay De-emphasis effective in the audio branch and in the display of measured values

3.6.15.9 SENSe:FREQuency Subsystem

The SENSe:FREQuency subsystem defines the frequency axis of the active display. The frequency axis can either be defined via the start/stop frequency or via the center frequency and span.

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:FREQuency			
:CENTer	<numeric_value>	HZ	
:LINK	STARt | STOP | SPAN	--	
:STEP	<numeric_value>	HZ	
:LINK	SPAN | RBW | OFF	--	
:FACTor	<numeric_value>	PCT	
:SPAN	<numeric value>	HZ	
:FULL	--	--	
:LINK	CENTer | STARt | STOP	--	
:STARt	<numeric_value>	HZ	
:LINK	CENTer | STOP | SPAN	--	
:STOP	<numeric_value>	HZ	
:LINK	CENTer | STARt |SPAN	--	
:MODE	CW | FIXed | SWEep | SCAN	--	
:OFFSet	<numeric_value>	HZ	
:CW:	<numeric_value>	HZ	
:STEP	<numeric_value>	HZ	
:FIXed	<numeric_value>	HZ	
:STEP	<numeric_value>	HZ	

[SENSe:]FREQuency:CENTer 0 GHz to f_{max}

This command defines the receiver frequency ot the center frequency of the analyzer.

Example: `"FREQ:CENT 100MHz"`

Features: *RST value: f_{max} / 2
SCPI: conforming

Modes: E, A, VA

In the analyzer mode, the automatic coupling of the parameters is set to SPAN FIXED.

[SENSe:]FREQuency:CENTer:LINK STARt | STOP | SPAN

This command defines the coupling of the center frequency to the start, stop frequency or the frequency span.

Example: `"FREQ:CENT:LINK STAR"`

Features: *RST value: SPAN
SCPI: device-specific

Mode: A

[SENSe:]FREQuency:CENTer:STEP 0 to f_{max}

This command defines the step width of the receiver or center frequency.

Example: `"FREQ:CENT:STEP 120MHz"`

Features: *RST value: - (AUTO 0.1 × SPAN is switched on)
SCPI: conforming

Modes: A, VA

[SENSe:]FREQuency:CENTer:STEP:LINK SPAN | RBW | OFF

This command couples the step width of the center frequency to span (span >0) or to the resolution bandwidth (span = 0) or cancels the couplings.

Example: `"FREQ:CENT:STEP:LINK SPAN"`

Features: *RST value: SPAN
SCPI: device-specific

Mode: A

[SENSe:]FREQuency:CENTer:STEP:LINK:FACTor 1 to 100 PCT

This command couples the step width of the center frequency with a factor to the span (span >0) or to the resolution bandwidth (span = 0).

Example: `"FREQ:CENT:STEP:LINK:FACT 20PCT"`

Features: *RST value: - (AUTO 0.1 × SPAN is switched on)
SCPI: device-specific

Mode: A

[SENSe:]FREQuency:SPAN 0 GHz to f_{max}

This command defines the frequency span of the analyzer.

Example: `"FREQ:SPAN 10MHz"`

Features: *RST value: f_{max}
SCPI: conforming

Mode: A

The automatic coupling of the parameters is set to CENTER FIXED.

[SENSe:]FREQuency:SPAN:FULL

This command sets the maximum frequency span of the analyzer.

Example: `"FREQ:SPAN:FULL"`

Features: *RST value: -
SCPI: conforming

Mode: A

This command is an event which is why it is not assigned an *RST value and has no query.

[SENSe:]FREQuency:SPAN:LINK CENTer | START | STOP

This command defines the coupling for frequency-span changes.

Example: `"FREQ:SPAN:LINK STOP"`

Features: *RST value: CENTer
SCPI: conforming

Mode: A

[SENSe:]FREQuency:STARt 0 GHz to f_{max}

This command defines the start frequency of the scan in receiver mode or the start frequency of the analyzer.

Example: `"FREQ:STAR 20MHz"`

Features: *RST value: 0
SCPI: conforming

Modes: E, A

In analyzer mode, the automatic coupling of the parameters is set to STOP FIXED.

[SENSe:]FREQuency:STARt:LINK CENTer | STOP | SPAN

This command defines the coupling for start-frequency changes.

Example: `"FREQ:STAR:LINK SPAN"`

Features: *RST value: STOP
SCPI: device-specific

Mode: A

[SENSe:]FREQuency:STOP 0 GHz to f_{max}

This command defines the stop frequency of the scan in receiver mode or the stop frequency of the analyzer.

Example: `"FREQ:STOP 2000MHz"`

Features: *RST value: f_{max}
SCPI: conforming

Modes: E, A

In analyzer mode, the automatic coupling of the parameters is set to STARt FIXED.

[SENSe:]FREQuency:STOP:LINK CENTer | STARt | SPAN

This command defines the coupling for stop-frequency changes.

Example: `"FREQ:STOP:LINK SPAN"`

Features: *RST value: STARt
SCPI: device-specific

Mode: A

[SENSe:]FREQuency:MODE CW | FIXed | SWEep | SCAN

This command switches between frequency (SWEep) and time (CW | FIXed) domain in the analyzer mode or between scan (SCAN) and single measurement (CW) in receiver mode.

Example: `"FREQ:MODE SWE"`

Features: *RST value: CW
SCPI: conforming

Modes: E, A

For CW and FIXed, the frequency setting is via command `FREQuency:CENTer`. In the SWEep or SCAN mode, the setting is via commands `FREQuency:STARt`, `STOP`, and in the SCAN subsystem. In the SWEep mode, the setting is via commands `FREQuency:STARt`, `STOP`, `CENTer` and `SPAN`. `SPAN`.

[SENSe:]FREQuency:OFFSet <numeric_value>

This command defines the frequency offset of the instrument.

Example: `"FREQ:OFFS 1GHZ"`

Features: *RST value: 0 Hz
SCPI: conforming

Modes: A, VA

[SENSe:]FREQuency[:CW|:FIXed] f_{min} to f_{max}

This command defines the receiver frequency

Example: `"FREQ:CW 50MHz"`

Features: *RST-Wert: 100MHz
SCPI: konform

Mode: E

[SENSe:]FREQuency[:CW|:FIXed]:STEP f_{min} .. f_{max}

This command defines the step width of the receiver frequency.

Example: `"FREQ:FIX:STEP 50kHz"`

Features: *RST-Wert: 10kHz
SCPI: konform

Mode: E

3.6.15.10 SENSe:MIXer - Subsystem

The SENSe:MIXer subsystem controls the settings of the external mixer. It is only active in Analyzer mode (`INSTrument SANalyzer`).

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:MIXer			
[:STATe]	<Boolean>	--	
:BLOCk	<Boolean>		
:PORTs	2 | 3		
:SIGNal	OFF | ON | AUTO		
:THReshold	<numeric_value>		
:HARMonic	<numeric_value>	--	Only query in band lock on
:TYPE	ODD | EVEN | EODD		Not in band lock off
:BAND	A|Q|U|V|E|W|F|D|G|Y|J		Not in band lock off
:LOSS			
[:LOW]	<numeric_value>	DB	
:HIGH	<numeric_value>	DB	Not in band lock off
:TABLe	<file_name>		
:BIAS	<numeric_value>	A	
:LIMit			
[:MAX]	<numeric_value>	A	Not in band lock on
:MIN	<numeric_value>	A	Not in band lock on

[SENSe:]MIXer[:STATe] ON | OFF

This command activates or shuts off the external mixer.

Example: `"MIX ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: A

This command is available only in conjunction with option FSE-B21, External Mixer Output.

[SENSe:]MIXer:BLOCk ON | OFF

This command activates the BAND LOCK ON or BAND LOCK OFF mode.

Example: `"MIX:BLOC ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: A

This command is available only if the external mixer (option FSE-B21) is switched on.

[SENSe:]MIXer:PORTs 2 | 3

This command activates the 2- or 3-port mixer. In the BAND LOCK ON mode, the command refers to the active band selected with `SENSe:MIXer:HARMonic:BAND` .

Example: `"MIX:PORT 3"`

Features: *RST value: 2
SCPI: device-specific

Mode: A

This command is available only if the external mixer (option FSE-B21) is switched on.

[SENSe:]MIXer:SIGNal ON | OFF | AUTO

This command activates the Signal ID or Auto ID mode.

Example: `"MIX:SIGN ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: A

This command is available only if the external mixer (option FSE-B21) is switched on.

[SENSe:]MIXer:THReshold 0.1 to 100 dB

This command sets the level threshold for auto ID.

Example: `"MIX:THR 20"`

Features: *RST value: 10
SCPI: device-specific

Mode: A

The command is available only if the external mixer (option FSE-B21) is switched on.

[SENSe:]MIXer:HARMonic <numeric_value>

With BAND LOCK OFF, this command sets the nth harmonic. The command may be a query with BAND LOCK ON.

Parameter: <numeric_value> := 2..X; X: depending on the LO

Example: `"MIX:HARM 5"`

Features: *RST value: 2
SCPI: conforming

Mode: A

[SENSe:]MIXer:HARMonic:TYPE ODD | EVEN | EODD

With BAND LOCK ON, this command sets the type of harmonic.

Example: `"MIX:HARM:TYPE EODD"`

Features: *RST value: EVEN
SCPI: device-specific

Mode: A

[SENSe:]MIXer:HARMonic:BAND A|Q|U|V|E|W|F|D|G|Y|J

With BAND LOCK ON, this command sets the active band.

Example: `"MIX:HARM:BAND E"`

Features: *RST value: U
SCPI: device-specific

Mode: A

[SENSe:]MIXer:LOSS[:LOW] <numeric_value>

This command sets the conversion loss of the mixer.

Example: `"MIX:LOSS -12DB"`

Features: *RST value: 0 dB
SCPI: conforming

Mode: A

[SENSe:]MIXer:LOSS:HIGH <numeric_value>

With BAND LOCK ON, this command sets the conversion loss of the mixer for higher harmonics in bands with two harmonics (band A: even harmonics, band Q: odd harmonics).

Example: `"MIX:LOSS:HIGH -14DB"`

Features: *RST value: 0 dB
SCPI: device-specific

Mode: A

[SENSe:]MIXer:LOSS:TABLe <file_name>

This command sets a conversion loss table.

Parameter: <file_name> := DOS file name

Example: `"MIX:LOSS:table mix_1"`

Features: *RST value: no table set
SCPI: device-specific

Mode: A

[SENSe:]MIXer:BIAS <numeric_value>

This command sets the bias current.

Example: `"MIX:BIAS 7mA"`

Features: *RST value: 0 A
SCPI: conforming

Mode: A

[SENSe:]MIXer:BIAS:LIMit[:MAX] <numeric_value>

This command sets the maximum limit of the bias current.

Example: `"MIX:BIAS:LIM 7mA"`

Features: *RST value: +10mA
SCPI: conforming

Mode: A

[SENSe:]MIXer:BIAS:LIMit:MIN <numeric_value>

This command sets the minimum limit of the bias current.

Example: `"MIX:BIAS:LIM:MIN -8mA"`

Features: *RST value: -10 mA
SCPI: conforming

Mode: A

3.6.15.11 SENSe:MSUMmary Subsystem

This subsystem controls the modulation summary setting for analog demodulation.
It is active only in conjunction with option Vector Analysis, FSE-B7.

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe<1|2>]			
:MSUMmary			Vector Signal Analysis
:AHOLd			
[:STATe]	<Boolean>		
:MODE	ABSolute | RELative		
:REFerence	<numeric_value>	PCT | HZ | DEG | RAD	
:AUTO	ONCE		no query
:MTIMe	<numeric_value>	S	

[SENSe:]MSUMmary:AHOLd[:STATe] ON | OFF

This command switches on the average/peak hold mode.

Example: `"MSUM:AHOL ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: VA-A

[SENSe:]MSUMmary:MODE ABSolute | RELative

This command selects the absolute or relative indication of the summary marker values.

Example: `"MSUM:MODE REL"`

Features: *RST value: ABSolute
SCPI: device-specific

Mode: VA-A

[SENSe:]MSUMmary:REFerence <numeric_value>

This command selects the reference modulation.

Parameter: <numeric_value> := 0.001PCT to 1000 PCT for AM
0.1HZ to 10MHZ for FM
0.0001RAD to 1000RAD for PM

Example: `"MSUM:REF 50PCT"`

Features: *RST value: 100PCT for AM
100KHZ for FM
10RAD for PM
SCPI: device-specific

Mode: VA-A

[SENSe:]MSUMmary:REFerence:AUTO ONCE

This command sets the current absolute measured values of the main modulation signal as reference values for the relative indication.

Example: `"MSUM:REF:AUTO ONCE"`

Features: *RST value: --
SCPI: device-specific

Mode: VA-A

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

[SENSe:]MSUMmary:MTIMe 0.1 s | 1 s

This command selects the measurement time for the summary markers.

Example: `"MSUM:MTIM 100US"`

Features: *RST value: 0.1S
SCPI: device-specific

Mode: VA-A

3.6.15.12 SENSe:POWer Subsystem

This subsystem controls the setting of the instrument's power measurements.

COMMAND	PARAMETER	UNIT	COMMENT
[SENSe<1|2>]			
:POWer			
:ACHannel			
:SPACing			
[:UPPer]	<numeric_value>	HZ	
:ACHannel	<numeric_value>	HZ	
:ALTernate<1|2>	<numeric_value>	HZ	
:ACPairs	1 | 2 | 3		
:BANDwidth			
[:CHANnel]	<numeric_value>	HZ	
:ACHannel	<numeric_value>	HZ	
:ALTernate<1|2>	<numeric_value>	HZ	
:BWIDth			
[:CHANnel]	<numeric_value>	HZ	
:ACHannel	<numeric_value>	HZ	
:ALTernate<1|2>	<numeric_value>	HZ	
:MODE	ABSolute | RELative		
:REFerence			
:AUTO	ONCE		no query
:PRESet	ACPower | CPOWer | OBANdwidth | OBWidth | CN | CN0		
:BANDwidth	<numeric_value>	PCT	
:BWIDth	<numeric_value>	PCT	

[SENSe:]POWer:ACHannel:SPACing[:UPPer] 0 Hz to 1000 MHz

This command defines the channel spacing of adjacent channel to carrier.

Example: `"POW:ACH:SPAC 28kHz"`

Features: *RST value: 24 kHz
SCPI: conforming

Mode: A-F

[SENSe:]POWer:ACHannel:SPACing:ACHannel 0 Hz to 1000 MHz

This command defines the channel spacing of adjacent channel to carrier. This command has the same effect as `POW:ACH:SPAC`.

Example: `"POW:ACH:SPAC:ACH 338kHz"`

Features: *RST value: 24 kHz
SCPI: device-specific

Mode: A-F

[SENSe:]POWer:ACHannel:SPACing:ALTernate<1|2> 0 Hz ... 1000 MHz

This command defines the spacing of the first (ALTernate1) or the second alternate adjacent channel (ALTernate2) relative to the carrier signal.

Example: `"POW:ACH:SPAC:ALT1 99kHz"`

Features: *RST value: 24 kHz
SCPI: device-specific

Mode: A-F

[SENSe:]POWer:ACHannel:ACPairs 1.| 2 | 3

This command sets the number of adjacent channels (upper and lower channel in pairs).

Example: `"POW:ACH:ACP 3"`

Features: *RST value: 1
SCPI: device-specific

Mode: A-F

[SENSe:]POWer:ACHannel:BANDwidth|BWIDth[:CHANnel] 0 Hz to 1000 MHz

This command sets the channel bandwidth of the radio communication system.

Example: `"POW:ACH:BWID 30kHz"`

Features: *RST value: 24 kHz
SCPI: device-specific

Mode: A-F

If the channel bandwidth of the adjacent channel is changed the bandwiths of all alternate adjacent channels are automatically set to the same value.

[SENSe:]POWer:ACHannel:BANDwidth|BWIDth:ACHannel 0 Hz to 1000 MHz

This command defines the channel bandwidth of the adjacent channel of the radio transmission system.

Example: `"POW:ACH:BWID:ACH 30kHz"`

Features: *RST value: 24 kHz
SCPI: device-specific

Mode: A-F

If the channel bandwidth of the adjacent channel is changed the bandwiths of all alternate adjacent channels are automatically set to the same value.

[SENSe:]POWer:ACHannel:BANDwidth|BWIDth:ALTernate<1|2> 0 Hz to 1000 MHz

This command defines the channel bandwidth of the first/second alternate adjacent channel of the radio transmission system.

Example: `"POW:ACH:BWID:ALT2 30kHz"`

Features: *RST value: 24 kHz
SCPI: device-specific

Mode: A-F

If the channel bandwidth of the alternate adjacent channel no. 1 is changed the bandwith of the alternate adjacent channel no. 2 is automatically set to the same value.

[SENSe:]POWer:ACHannel:MODE ABSolute | RELative

This command toggles between absolute and relative measurement.

Example: `"POW:ACH:MODE REL"`

Features: *RST value: ABSolute
SCPI: device-specific

Mode: A-F

For the relative measurement the reference value is set to the currently measured channel power by command `POW:ACH:REF:AUTO ONCE`.

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

This command sets the reference value to the currently measured channel power.

Example: `"POW:ACH:REF:AUTO ONCE"`

Features: *RST value: -
SCPI: device-specific

Mode: A-F

This command is an event which is why it is not assigned an *RST value and has no query.

[SENSe:]POWer:ACHannel:PRESet ACPower | CPOWer | OBANdwidth|OBWidth | CN | CN0

This command selects the type of power measurement.

Example: `"POW:ACH:REF:PRES ACP"`

Features: *RST value: -
SCPI: device-specific

Mode: A-F

[SENSe:]POWer:BANDwidth|BWIDth 0 to 100PCT

This command defines the percentage of the power with respect to the total power.

Example: `"POW:BWID 95PCT"`

Features: *RST value: 99PCT
SCPI: device-specific

Mode: A-F

This value defines the occupied bandwidth (measurement `POW:ACH:PRES OBW`).

3.6.15.13 SENSe:ROSCillator Subsystem

This subsystem controls the reference oscillator.

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:ROSCillator			
:SOURce	INTernal | EXTernal	--	
:EXTernal			
:FREQuency	<numeric_value>	HZ	
[:INTernal]			
:TUNe	<numeric_value>		
:SAVe			no query

[SENSe:]ROSCillator:SOURce INTernal | EXTernal

This command controls selection of the reference oscillator.

Example: `"ROSC:SOUR EXT"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

If the external reference oscillator is selected, the reference signal must be connected to the rear panel of the instrument. *RST has no influence on this setting.

[SENSe:]ROSCillator:EXTernal:FREQuency 1MHz to 16MHz

This command defines the frequency of the external reference oscillator.

Example: `"ROSC:EXT:FREQ 5MHz"`

Features: *RST value: 10MHz
SCPI: conforming

Modes: E, A, VA

The value of the external reference frequency (1MHz to 16MHz) is rounded in steps of 1MHz.

[SENSe:]ROSCillator[:INTernal]:TUNe 0 to 4095

This command defines the value for the tuning of the internal reference oscillator.

Example: `"ROSC:TUN 128"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

The reference oscillator should be tuned only if an error has been detected in the frequency accuracy check. After PRESET or switching on the instrument, the saved value of the reference frequency is restored.

[SENSe:]ROSCillator[:INTernal]:TUNe:SAVe

This command saves the new value for the tuning of the internal reference oscillator. The factory-set value in the EEPROM is overwritten.

Example: `"ROSC:TUN:SAV"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

3.6.15.14 SENSe:SCAN - Subsystem

This subsystem controls the parameters for the receiver scan data.

COMMAND	PARAMETER	UNIT	COMMENT
[SENSe]			
:SCAN<1...10>			
:STARt	<numeric_value>	HZ	
:STOP	<numeric_value>	HZ	
:STEP	<numeric_value>	HZ	
:BANDwidth			
:RESolution	<numeric_value>	HZ	
:TIME	<numeric_value>	s	
:INPut			
:TYPe	INPUT1 | INPUT2		
:ATTenuation	<numeric_value>	dB	
:AUTO	<Boolean>	--	
:GAIN			
:STATe	<Boolean>	--	
:AUTO	<Boolean>	--	
:RANGes			
[:COUNt]	<numeric_value>	--	

[SENSe:]SCAN<1 to 10>:STARt f_{min} to f_{max}

This command defines the start frequency of a receiver subscan.

Example: `"SCAN1:STAR 50kHz"`

Features: *RST value: 150 kHz (range1)
30 MHz (range2)
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:STOP f_{min} to f_{max}

This command defines the stop frequency of a receiver subscan.

Example: `"SCAN1:STOP 50kHz"`

Features: *RST value: 30 MHz (range1)
1 GHz (range2)
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:STEP f_{min} to f_{max}

This command defines the step size for the frequency of a receiver subscan.

Example: `"SCAN1:STEP 100Hz"`

Features: *RST value: 4 kHz (range 1)
40 kHz (range 2)
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:BANDwidth:RESolution f_{min} to f_{max}

This command defines the bandwidth for a receiver subscan.

Example: `"SCAN1:BAND:RES 1MHz"`

Features: *RST value: 9 kHz (Range 1)
120 kHz (Range 2)
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:TIME 100 µs to 100 s

This command defines the measurement time of the receiver subscan.

Example: `"SCAN1:TIME 1 ms"`

Features: *RST value: 1 ms (range 1)
100µs (range 2)
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:INPut:TYPE INPUT1 | INPUT2

This command defines the input for a receiver subscan.

Example: `"SCAN1:INP:TYPE INPUT2"`

Features: *RST value: INPUT1
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:INPut:ATTenuation dB_{min} to dB_{max}

This command defines the RF attenuation for a receiver subscan.

Example: `"SCAN1:INP:ATT 30dB"`

Features: *RST value: 10 dB
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:INPut:ATTenuation:AUTO ON | OFF

This command switches on or off the autoranging function in a receiver subscan.

Example: `"SCAN1:INP:ATT:AUTO ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:INPut:GAIN:STATE ON | OFF

This command switches on or off the preamplifier in a receiver subscan.

Example: `"SCAN1:INP:GAIN:STAT ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: E

[SENSe:]SCAN<1 to 10>:INPut:GAIN:AUTO ON | OFF

This command includes the preamplifier in the autoranging function of a receiver subscan.

Example: `"SCAN1:INP:GAIN:AUTO ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: E

[SENSe:] SCAN:RANGes[:COUNt] 1 to 10

This command determines the number of ranges.

Example: `"SCAN:RANG:COUN 3"`

Features: *RST-Wert: 2
SCPI: gerätespezifisch

Mode: E

3.6.15.15 SENSe:SWEep Subsystem

This subsystem controls the sweep parameters.

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:SWEep			
:TIME	<numeric_value>	S	
:AUTO	<Boolean>	--	
:COUNt	<numeric_value>	--	
:EGATe	<Boolean>	--	
:LEVel	<numeric_value>	V	
:TYPE	LEVel | EDGE	--	
:POLarity	POSitive|NEGative	--	
:HOLDoff	<numeric_value>	S	
:LENGth	<numeric_value>	S	
:SOURce	EXTernal | RFPower	--	
:GAP	<Boolean>	--	
:PRETrigger	<numeric_value>	S	
:TRGTogap	<numeric_value>	S	
:LENGth	<numeric_value>	S	

[SENSe:]SWEep:TIME <numeric_value>

This command defines the duration of a single measurement or the duration of the sweep.

The allowed value range depends on the operating mode (see Chapter 2, Soft keys MEAS TIME (receiver mode) and SWEEP TIME MANUAL (analyzer mode)).

Example: `"SWE:TIME 10s"`

Features: *RST value - (AUTO is set to ON)
SCPI: conforming

Modes: E, A, VA-A

In analyzer and vector analyzer mode, automatic coupling is switched off if `SWEep:TIME` is directly programmed.

[SENSe:]SWEep:TIME:AUTO ON | OFF

This command switches the automatic coupling of the sweep time for the frequency span or bandwidth settings.

Example: `"SWE:TIME:AUTO ON"`

Features: *RST value: ON
SCPI: conforming

Mode: A

If `SWEep:TIME` is directly programmed, automatic coupling is switched off.

[SENSe:]SWEep:COUNt 0 to 32767

This command defines the number of sweeps started with single sweep.

Example: "SWE:COUNT 64"

Features: *RST value: 0
SCPI: conforming

Modes: E, A, VA-D

This parameter defines the number of sweeps or the number of averaging procedures. In the average mode, the value 0 defines a running averaging of measurement data over 10 sweeps.

[SENSe:]SWEep:EGATe ON | OFF

This command controls the sweep with the external gate signal.

Example: "SWE:EGAT ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A

[SENSe:]SWEep:EGATe:LEVel -5V to +5V

This command determines the threshold for the external gate signal.

Example: "SWE:EGAT:LEV 3V"

Features: *RST value: 2V
SCPI: device-specific

Mode: A

If SWEep:TIME is directly programmed, automatic coupling is switched off.

[SENSe:]SWEep:EGATe:TYPE LEVel | EDGE

This command sets the type of triggering (level or edge) by the external gate signal.

Example: "SWE:EGAT:TYPE EDGE"

Features: *RST value: EDGE
SCPI: device-specific

Mode: A

Parameter EGATe:LENGth is not used for level triggering.

[SENSe:]SWEep:EGATe:POLarity POSitive | NEGative

This command determines the polarity of the external gate signal.

Example: "SWE:EGAT:POL POS"

Features: *RST value: POSitive
SCPI: device-specific

Mode: A

[SENSe:]SWEep:EGATe:HOLDoff 0 to 100s

This command defines the delay time between the external gate signal and the continuation of the sweep.

Example: "SWE:EGAT:HOLD 100us"

Features: *RST value: 0s
SCPI: device-specific

Mode: A

The values for the delay time can be set in steps 1, 2, 3 and 5.

[SENSe:]SWEep:EGATe:LENGth 0 to 100s

In case of edge triggering, this command determines the time interval in which the instrument sweeps.

Example: "SWE:EGAT:LENG 10ms"

Features: *RST value: 0s
SCPI: device-specific

Modes: A

The values for the delay time can be set in steps 1, 2, 3 and 5.

[SENSe:]SWEep:EGATe:SOURce EXTernal | RFPower

This command toggles between external gate signal and RF power signal.

Example: "SWE:EGAT:SOUR RFP"

Features: *RST value: EXTernal
SCPI: device-specific

Mode: A

[SENSe:]SWEep:GAP ON | OFF

This command controls the operating mode GAP SWEEP.

Example: "SWE:GAP ON"

Features: *RST value: OFF
SCPI: device-specific

Mode: A-Z

Operating mode GAP SWEEP for measurements in the time domain controls the display of measured values. Measured values can be blanked for a defined time range (GAP).

[SENSe:]SWEep:GAP:PRETrigger 0 to 100s

This command defines the evaluation time for measured values before the pretrigger time (resolution: 50 ns).

Example: "SWE:GAP:PRET 100us"

Features: *RST value: 0s
SCPI: device-specific

Mode: A

[SENSe:]SWEep:GAP:TRGTogap 0 to 100s

This command defines the time between the pretrigger time and the beginning of the gap (trigger-to-gap time) (resolution: 50 ns).

Example: "SWE:GAP:TRGT 50us"

Features: *RST value: 0s
SCPI: device-specific

Mode: A

[SENSe:]SWEep:GAP:LENGth 0 to 100s

This command defines the gap length.

Example: "SWE:GAP:LENG 400us"

Features: *RST value: 0s
SCPI: device-specific

Mode: A

The gap length can be programmed from 0 to 100s in steps of 1, 2, 3 and 5.

[SENSe:]SWEep:SPACing LINear | LOGarithmic | AUTO

This command toggles between linear and logarithmic step modes of the receiver. In analyzer mode, it toggles between linear and logarithmic sweep.

Example: "SWE:SPAC LOG"

Features: *RST value: LIN
SCPI: conforming

Modes: E, A, VA

The frequency axis is set to linear or logarithmic scaling accordingly.

3.6.15.16 SENSe:TV Subsystem

This subsystem controls the optional TV-demodulator (only in conjunction with option TV-Demodulator, FSE-B3).

COMMAND	PARAMETERS	UNIT	COMMENT
[SENSe]			
:TV			Option TV-Demodulator
[:STATe]	<Boolean>	--	
:PSOFfset	<numeric_value>	HZ	

[SENSe:]TV[:STATe] ON | OFF

This command switches the optional TV-demodulator on or off.

Example: `"TV ON"`

Features: *RST value: OFF
SCPI: device-specific

Mode: A-Z

This command is available only in conjunction with option TV-Demodulator, FSE-B3.

[SENSe:]TV:PSOFfset 0 to 6.5 MHz

This command defines the frequency offset between video and audio carrier of the measured signal.

Example: `"TV:PSOF 1 MHz"`

Features: *RST value: 5 MHz
SCPI: device-specific

Mode: A-Z

This command is available only in conjunction with option TV-Demodulator, FSE-B3.

3.6.16 SOURce Subsystem

The SOURce subsystem controls the output signals of the instrument when the option Tracking Generator is installed. In the analyzer mode, in the split screen mode, a distinction is made between SOURce1 (screen A) and SOURce2 (screen B).

COMMAND	PARAMETERS	UNIT	COMMENT
SOURce<1|2>			Option Mitlaufgenerator
:AM			
:STATe	<Boolean>		
:DM			
:STATe	<Boolean>		
:FM			
:STATe	<Boolean>		
:FREQuency			
:OFFSet	<numeric_value>	HZ	
:POWer			
:ALC			
:SOURce	INTernal | EXTernal		
[:LEVel]			
[:IMMediate]			
[:AMPLitude]	<numeric_value>	DBM	
:OFFSet	<numeric_value>	DB	

SOURce<1|2>:AM:STATe ON | OFF

This command switches on or off the external amplitude modulation of the tracking generator.

Example: `"SOUR:AM:STAT ON "`

Features: *RST-value: OFF
SCPI: conforming

Modes: E, A, VA

External ALC and external I/Q-modulation is switched off, if active. This command is only valid in conjunction with option Tracking Generator.

SOURce<1|2>:DM:STATe ON | OFF

This command switches on or off the external delta modulation of the tracking generator.

Example: `"SOUR:DM:STAT ON "`

Features: *RST- value: OFF
SCPI: conforming

Modes: E, A, VA

External AM, external ALC, external FM and external frequency offset are switched off, if active. This command is only valid in conjunction with option Tracking Generator.

SOURce<1|2>:FM:STATe ON | OFF

This command switches on or off the external frequency modulation of the tracking generator.

Example: "SOUR:FM:STAT ON "

Features: *RST-value: OFF
SCPI: conforming

Modes: E, A, VA

External AM, external I/Q-modulation and frequency offset are switched off, if active. This command is only valid in conjunction with option Tracking Generator.

SOURce<1|2>:FREQuency:OFFSet -200MHz to 200MHz

This command defines a frequency offset of the tracking generators to the current instrument frequency.

Example: "SOUR:FREQ:OFFS "

Features: *RST-value: 0 Hz
SCPI: conforming

Modes: E, A, VA

External delta modulation is switched off, if active. This command is only valid in conjunction with option Tracking Generator.

SOURce<1|2>:POWer:ALC:SOURce INTernal | EXTernal

This command switches on or off the external level control (ALC).

Example: "SOUR:POW:ALC:SOUR INT "

Features: *RST- value: INT
SCPI: conforming

Modes: E, A, VA

External AM and external delta modulation are switched off, if active. This command is only valid in conjunction with option Tracking Generator.

SOURce<1|2>:POWer[:LEVel][:IMMediate][:AMPLitude] -20dBm to 0dBm / Option FSE-B12: -90dBm to 0dBm

This command defines the level of the tracking generator.

Example: "SOUR:POW -20dBm"

Features: *RST- value:
SCPI: conforming

Modes: E, A, VA

This command is only valid in conjunction with option Tracking Generator.

SOURce<1|2>:POWer[:LEVel][:IMMediate]:OFFSet -200dB to +200dB

This command defines a level offset for the tracking generator.

Example: "SOUR:POW:OFFS -10dB"

Features: *RST- value: 0dB
SCPI: conforming

Modes: E, A, VA

This command is only valid in conjunction with option Tracking Generator.

3.6.17 STATus Subsystem

The STATus subsystem contains the commands for the status reporting system (see Section 3.8, Status Reporting System"). *RST does not influence the status registers.

COMMAND	PARAMETERS	UNIT	COMMENT
STATus			
:OPERation			
[:EVENt]?	--	--	
:CONDition?	--	--	
:ENABle	0 to 65535	--	
:PTRansition	0 to 65535	--	
:NTRansition	0 to 65535	--	
:PRESet	--	--	
:QUEStionable			
[:EVENt]?	--	--	
:CONDition?	--	--	
:ENABle	0 to 65535	--	
:PTRansition	0 to 65535	--	
:NTRansition	0 to 65535	--	
:POWer			
[:EVENt]?	--	--	
:CONDition?	--	--	
:ENABle	0 to 65535	--	
:PTRansition	0 to 65535	--	
:NTRansition	0 to 65535	--	
:LIMit			
[:EVENt]?	--	--	
:CONDition?	--	--	
:ENABle	0 to 65535	--	
:PTRansition	0 to 65535	--	
:NTRansition	0 to 65535	--	
:LMARgin			
[:EVENt]?	--	--	
:CONDition?	--	--	
:ENABle	0 to 65535	--	
:PTRansition	0 to 65535	--	
:NTRansition	0 to 65535	--	
:SYNC			
[:EVENt]?	--	--	
:CONDition?	--	--	
:ENABle	0 to 65535	--	
:PTRansition	0 to 65535	--	
:NTRansition	0 to 65535	--	
:ACPLimit			
[:EVENt]?	--	--	
:CONDition?	--	--	
:ENABle	0 to 65535	--	
:PTRansition	0 to 65535	--	
:NTRansition	0 to 65535	--	

COMMAND	PARAMETERS	UNIT	COMMENT
STATus			
:QUEStionable	--	--	
:FREQuency	--	--	
[:EVENt]?	0 to 65535	--	
:CONDition?	0 to 65535	--	
:ENABle	0 to 65535	--	
:PTRansition	--	--	
:NTRansition	--	--	
:TRANsducer			
[:EVENt]?	--	--	
:CONDition?	--	--	
:ENABle	0 to 65535	--	
:PTRansition	0 to 65535	--	
:NTRansition	0 to 65535	--	
:QUEue?	--	--	
[:NEXT]?	--	--	

STATus:OPERation[:EVENt]?

This command queries the contents of the EVENt section of the STATus:OPERation register.

Example: `"STAT:OPER?"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

The contents of the EVENt section is deleted with readout.

STATus:OPERation:CONDition?

This command queries the CONDition section of the STATus:OPERation register.

Example: `"STAT:OPER:COND?"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

Readout does not delete the contents of the CONDition section. The value returned reflects the current hardware status.

STATus:OPERation:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus:QUEStionable register.

Example: `"STAT:OPER:ENAB 65535"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:OPERation:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:OPERation register from 0 to 1 for the transitions of the CONDition bit.

Example: `"STAT:OPER:PTR 65535"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

STATus:OPERation:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:OPERation register from 1 to 0 for the transitions of the CONDition bit.

Example: `"STAT:OPER:NTR 65535"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

STATus:PRESet

This command resets the edge detectors and ENABle parts of all registers to a defined value. All PTRansition parts are set to FFFFh, i.e., all transitions from 0 to 1 are detected. All NTRansition parts are set to 0, i.e., a transition from 1 to 0 in a CONDition bit is not detected. The ENABle part of the STATus:OPERation and STATus:QUEStionable registers are set to 0, i.e., all events in these registers are not passed on.

Example: `"STAT:PRES"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

STATus:QUEStionable[:EVENt]?

This command queries the contents of the EVENt section of the STATus:QUEStionable register.

Example: `"STAT:QUES?"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

Readout deletes the contents of the EVENt section.

STATus:QUEStionable:CONDition?

This command queries the CONDition section of the STATus:QUEStionable register.

Example: `"STAT:QUES:COND?"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

Readout does not delete the contents of the CONDition section.

STATus:QUEStionable:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus-QUEStionable register.

Example: `"STAT:QUES:ENAB 65535"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:QUEStionable:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:OPERation register from 0 to 1 for the transitions of the CONDition bit.

Example: `"STAT:QUES:PTR 65535"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

STATus:QUEStionable:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:OPERation register from 1 to 0 for the transitions of the CONDition bit.

Example: `"STAT:QUES:NTR 65535"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

STATus:QUEStionable:POWer[:EVENt]?

This command queries the contents of the EVENt section of the STATus:QUEStionable:POWer register.

Example: `"STAT:QUES?"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

Readout deletes the contents of the EVENt section.

STATus:QUEStionable:POWer:CONDition?

This command queries the content of the CONDition section of the STATus:QUEStionable:POWer register.

Example: `"STAT:QUES:COND?"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

Readout does not delete the contents of the CONDition section.

STATus:QUEStionable:POWer:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus:QUEStionable:POWer register.

Example: `"STAT:QUES:ENAB 65535"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:QUEStionable:POWer:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable:POWer register from 0 to 1 for the transitions of the CONDition bit.

Example: `"STAT:QUES:PTR 65535"`

Features: *RST-value: –
SCPI: conforming

Modes: E, A, VA

STATus:QUEStionable:POWer:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable:POWer register from 1 to 0 for the transitions of the CONDition bit.

Example: `"STAT:QUES:NTR 65535"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

STATus:QUEStionable:LIMit[:EVENt]?

This command queries the contents of the EVENt section of the STATus:QUEStionable:LIMit register.

Example: `"STAT:QUES?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout deletes the contents of the EVENt section.

STATus:QUEStionable:LIMit:CONDition?

This command queries the contents of the CONDition section of the STATus:QUEStionable:LIMit register.

Example: `"STAT:QUES:COND?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout does not delete the contents of the CONDition section.

STATus:QUEStionable:LIMit:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus:QUEStionable register.

Example: `"STAT:QUES:ENAB 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:QUEStionable:LIMit:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable:LIMit register from 0 to 1 for the transitions of the CONDition bit.

Example: `"STAT:QUES:PTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:LIMit:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable:LIMit register from 1 to 0 for the transitions of the CONDition bit.

Example: `"STAT:QUES:NTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:LMARgin[:EVENt]?

This command queries the contents of the EVENt section of the STATus:QUEStionable:LMARgin register.

Example: `"STAT:QUES?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout deletes the contents of the EVENt section.

STATus:QUEStionable:LMARgin:CONDition?

This command queries the contents of the CONDition section of the STATus:QUEStionable:LMARgin register.

Example: `"STAT:QUES:COND?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout does not delete the contents of the CONDition section.

STATus:QUEStionable:LMARgin:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus:QUEStionable:LMARgin register.

Example: `"STAT:QUES:ENAB 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:QUEStionable:LMARgin:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable: LMARgin register from 0 to 1 for the transitions of the CONDition bit.

Example: `"STAT:QUES:PTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:LMARgin:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable: LMARgin register from 1 to 0 for the transitions of the CONDition bit.

Example: `"STAT:QUES:NTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:SYNC[:EVENt]?

This command queries the contents of the EVENt section of the STATus:QUEStionable:SYNC register.

Example: `"STAT:QUES?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout deletes the contents of the EVENt section.

STATus:QUEStionable:SYNC:CONDition?

This command queries the contents of the CONDition section of the STATus:QUEStionable:SYNC register.

Example: `"STAT:QUES:COND?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout does not delete the contents of the CONDition section.

STATus:QUEStionable:SYNC:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus:QUEStionable: SYNC register.

Example: `"STAT:QUES:ENAB 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:QUEStionable:SYNC:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable: SYNC register from 0 to 1 for the transitions of the CONDition bit.

Example: `"STAT:QUES:PTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:SYNC:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable: SYNC register from 1 to 0 for the transitions of the CONDition bit.

Example: `"STAT:QUES:NTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:ACPLimit[:EVENt]?

This command queries the contents of the EVENt section of the STATus:QUEStionable:ACPLimit register.

Example: `"STAT:QUES:ACPL?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout deletes the contents of the EVENt section.

STATus:QUEStionable:ACPLimit:CONDition?

This command queries the contents of the CONDition section of the STATus:QUEStionable:ACPLimit register.

Example: `"STAT:QUES:ACPL:COND?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout does not delete the contents of the CONDition section.

STATus:QUEStionable:ACPLimit:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus:QUEStionable:ACPLimit register.

Example: `"STAT:QUES:ACPL:ENAB 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:QUEStionable:ACPLimit:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable: ACPLimit register from 0 to 1 for the transitions of the CONDition bit.

Example: `"STAT:QUES:ACPL:PTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:ACPLimit:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable: ACPLimit register from 1 to 0 for the transitions of the CONDition bit.

Example: `"STAT:QUES:ACPL:NTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:FREQuency[:EVENt]?

This command queries the contents of the EVENt section of the STATus:QUEStionableFREQuency register.

Example: `"STAT:QUES:FREQ?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout deletes the contents of the EVENt section.

STATus:QUEStionable:FREQuency:CONDition?

This command queries the contents of the CONDition section of the STATus:QUEStionable:FREQuency register.

Example: `"STAT:QUES:FREQ:COND?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout does not delete the contents of the CONDition section.

STATus:QUEStionable:FREQuency:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus:QUEStionable:FREQuency register.

Example: `"STAT:QUES:FREQ:ENAB 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:QUEStionable:FREQuency:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable:FREQuency register from 0 to 1 for the transitions of the CONDition bit.

Example: `"STAT:QUES:FREQ:PTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:FREQuency:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable:FREQuency register from 1 to 0 for the transitions of the CONDition bit.

Example: `"STAT:QUES:FREQ:NTR 65535"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:TRANsducer[:EVENt]?

This command queries the contents of the EVENt section of the STATus:QUEStionable:TRANsducer register.

Example: `"STAT:QUES:TRAN?"`

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout deletes the contents of the EVENt section.

STATus:QUEStionable:TRANsducer:CONDition?

This command queries the contents of the CONDition section of the STATus:QUEStionable:FREQuency register.

Example: "STAT:QUES:TRAN:COND?"

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

Readout does not delete the contents of the CONDition section.

STATus:QUEStionable:TRANsducer:ENABle 0 to 65535

This command sets the bits of the ENABle section of the STATus:QUEStionable:TRANsducer register.

Example: "STAT:QUES:TRAN:ENAB 65535"

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

The ENABle register selectively enables the individual events of the associated EVENt section for the sum bit in the status byte.

STATus:QUEStionable:TRANsducer:PTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable:TRANsducer register from 0 to 1 for the transitions of the CONDition bit.

Example: "STAT:QUES:TRAN:PTR 65535"

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEStionable:TRANsducer:NTRansition 0 to 65535

This command sets the edge detectors of all bits of the STATus:QUEStionable:TRANsducer register from 1 to 0 for the transitions of the CONDition bit.

Example: "STAT:QUES:TRAN:NTR 65535"

Features: *RST value: –
SCPI: device-specific

Modes: E, A, VA

STATus:QUEue[:NEXT]?

This command queries the earliest entry to the error queue, thus deleting it.

Example: "STAT:QUE?"

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

Positive error numbers indicate device-specific errors, negative error numbers are error messages defined by SCPI (cf. Appendix B). If the error queue is empty, the error number 0, "no error", is returned. This command is identical with the command SYSTem:ERRor.

3.6.18 SYSTem Subsystem

This subsystem comprises a series of commands for general functions.

COMMAND	PARAMETERS	UNIT	COMMENT
SYSTem			
:COMMunicate			
:GPIB			
[:SELF]			
:ADDRess	0 to 30	--	
:RTERminator	LFEoi | EOI		
:RDEVice<1|2>			
:ADDRess	0 to 30	--	
:SERial<1|2>			
:CONTrol			
:DTR	IBFull | OFF		
:RTS	IBFull | OFF		
[:RECeive]		--	
:BAUD	<numeric_value>	--	
:BITS	7 | 8		
:PARity			
[:TYPE]	EVEN | ODD | NONE	--	
:SBITs	1 | 2		
:PACE	XON | NONE	--	
:PRINter			
:ENUMerate			
[:NEXT]?			query only
:FIRSt?			query only
:SELect	<printer_name>		
:DATE	<num>, <num>, <num>	--	
:DISPlay			
:UPDate	ON | OFF		
:ERRor?	--		query only
:PASSword		--	
[:CENable]	<string>		no query
:PRESet	--		no query
:SET	<block>	--	
:SPEaker		--	
:VOLume	<numeric_value>	--	
:TIME	0 to 23, 0 to 59, 0 to 59		
:VERSion?	--		query only

SYSTem:COMMunicate:GPIB[:SELF]:ADDRess 0 to 30

This command changes the IEC/IEEE-bus address of the unit.

Example: `"SYST:COMM:GPIB:ADDR 18"`

Features: *RST value: - (no influence on this parameter)
SCPI: conforming

Modes: E, A, VA

SYSTem:COMMunicate:GPIB[:SELF]:RTERminator LFEOI | EOI

This command changes the delimiter.

Example: `"SYST:COMM:GPIB:RTER EOI"`

Features: *RST value: LFEOI
SCPI: device-specific

Modes: E, A, VA

The instrument contains a DMA-channel for communication via IEC-bus. This ensures maximum speed for the transfer of commands and data. The parser for command decoding integrated in the instrument is, however, only activated by the delimiter when the command is completely transferred. In order to make this possible for the transfer of binary data, too (e. g. trace data which are retransferred into the instrument), the delimiter recognition must be switched to the EOI signal prior to the transfer. Output of binary data from the instrument does not require such a switching.

SYSTem:COMMunicate:GPIB:RDEVice<1|2>:ADDRess 0 to 30

This command changes the IEC/IEEE-bus address of the unit which is selected as hardcopy device 1 or 2, provided that the IEC/IEEE-bus interface of this unit is set as an interface.

Example: `"SYST:COMM:GPIB:RDEV2:ADDR 5"`

Features: *RST value: 4
SCPI: conforming

Modes: E, A, VA

SYSTem:COMMunicate:SERial<1|2>:CONTrol:DTR IBFull | OFF
SYSTem:COMMunicate:SERial<1|2>:CONTrol:RTS IBFull | OFF

These commands switch the hardware handshake procedure for the given serial interface off (OFF) or on (IBFull).

Examples: `"SYST:COMM:SER:CONT:DTR OFF"`
`"SYST:COMM:SER2:CONT:RTS IBF"`

Features: *RST value: OFF
SCPI: conforming

Modes: E, A, VA

The two commands have the same meaning. SERial1 and SERial 2 correspond to device COM1and COM2, respectively.

SYSTem:COMMunicate:SERial<1|2>[:RECeive]:BAUD 75 | 150 | 300 | 600 | 1200 | 2400 | 9600

This command sets the transmission speed for the given serial interface.

Example: `"SYST:COMM:SER:BAUD 2400"`

Features: *RST value: 9600
SCPI: conforming

Modes: E, A, VA

SERial1 and SERial 2 correspond to device interface COM1 and COM2, respectively. Permissible values are 75 Baud, 150 Baud, 300 Baud, 600 Baud, 1200 Baud, 2400 Baud, 4800 Baud, 9600 Baud.

SYSTem:COMMunicate:SERial<1|2>[:RECeive]:BITS 7 | 8

This command defines the number of data bits per data word for the given serial interface.

Example: `"SYST:COMM:SER2:BITS 7"`

Features: *RST value: 8
SCPI: conforming

Modes: E, A, VA

SERial1 and SERial 2 correspond to device interface COM1 and COM2, respectively.

SYSTem:COMMunicate:SERial<1|2>[:RECeive]:PARity[:TYPE] EVEN | ODD | NONE

This command defines the parity check for the given serial interface.

Example: `"SYST:COMM:SER:PAR EVEN"`

Features: *RST value: NONE
SCPI: conforming

Modes: E, A, VA

SERial1 and SERial 2 correspond to device interface COM1 and COM2, respectively. Permissible values are:

EVEN	even parity
ODD	odd parity
NONE	no parity check.

SYSTem:COMMunicate:SERial<1|2>[:RECeive]:SBITs 1|2

This command defines the number of stopbits per data word for the given serial interface.

Example: `"SYST:COMM:SER:SBITs 2"`

Features: *RST value: 1
SCPI: conforming

Modes: E, A, VA

SERial1 and SERial 2 correspond to device interface COM1 and COM2, respectively.

SYSTem:COMMunicate:SERial<1|2>[:RECeive]:PACE XON | NONE

This command switches on or off the software handshake for the given serial interface.

Example: `"SYST:COMM:SER:PACE XON"`

features: *RST value: NONE
SCPI: conforming

Modes: E, A, VA

SERial1 and SERial 2 correspond to device interface COM1 and COM2, respectively.

SYSTem:COMMunicate:PRINter:ENUMerate:FIRSt?

This command queries the name of the first printer (in the list of printers) under Windows NT.

The names of other installed printers can be queried with command `SYSTem:COMMunicate:PRINter:ENUMerate:NEXT?.`

If no printer is configured an empty string is output.

Example: `"SYST:COMM:PRIN:ENUM:FIRS?"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

SYSTem:COMMunicate:PRINter:ENUMerate:NEXT?

This command queries the name of the next printer installed under Windows NT.

This command can only be sent after command `SYSTem:COMMunicate:PRINter:ENUMerate:FIRSt?.`

An empty string is output after all printer names have been output.

Example: `"SYST:COMM:PRIN:ENUM:NEXT?"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

SYSTem:COMMunicate:PRINter:SELect <printer_name>

This command selects one of the printers installed under Windows NT.

The name of the first printer is queried with `FIRSt?.` After that the names of other installed printers can be queried with `NEXT?`.

Parameter: <printer_name> ::= string which has been queried with commands `SYSTem:COMMunicate :PRINter:ENUMerate:FIRSt?` and `NEXT?.`

Example: `"SYST:COMM:PRIN:SEL 'HP_DESKJET660'"`

Features: *RST value: -
SCPI: device-specific

Modes: E, A, VA

SYSTem:DATE 1980 to 2099, 1 to 12, 1 to 31

This command is used to enter the date for the internal calendar.

Example: `" SYST:DATE 1994,12,1"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

The sequence of entry is year, month, day.

SYSTem:DISPlay:UPDate ON | OFF

This command switches on or off the update of all display elements.

Example: `" SYST:DISP ON`

Features: *RST value: OFF
SCPI: device specific

SYSTem:ERRor?

This command queries the earliest entry to the error queue, thus deleting it. .

Example: `"SYST:ERR?"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

Positive error numbers indicate device-specific errors, negative error numbers are error messages defined by SCPI (cf. Appendix B). If the error queue is empty, the error number 0, "no error", is returned. This command is identical with the command `STATus:QUEue:NEXT?`. This command is a query which is why it is not assigned an *RST value.

SYSTem:PASSword[:CENable] <string>

This command enables access to the service functions by means of the password.

Example: `"SYST:PASS 'XXXX'"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

This command is an event which is why it is not assigned an *RST value and has no query.

SYSTem:SET <block>

The query `SYSTem:SET?` causes the data of the current instrument setting to be transmitted to the controller in binary form (SAVE function). The data can be read back into the instrument (RECALL function) by means of command `SYSTem:SET` <block>. If the data records are stored on the instrument harddisk with SAVE/RECALL (`MMEMory:STORe` bzw. `MMEMory:LOAD`), it is possible to store the data in an external computer by means of `SYSTem:SET`.

Example: `"SYST:SET "`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

The receive terminator has to be set to EOI to ensure reliable transfer of data (setting `SYST:COMM:GPIB:RTER EOI`).

SYSTem:PRESet

This command triggers an instrument reset.

Example: `"SYST:PRES"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

The effect of this command corresponds to that of the *PRESET* key with manual control or to the *RST command.

SYSTem:SPEaker:VOLume 0 to 1

This command sets the volume of the built-in loudspeaker for demodulated signals.

Example: `"SYST:SPE:VOL 0.5"`

Features: *RST value: 0
SCPI: device-specific

Modes: E, A

The value 0 is the lowest volume, the value 1 is the highest volume.

SYSTem:TIME 0 to 23, 0 to 59, 0 to 59

This command sets the internal clock.

Example: `"SYST:TIME 12,30,30"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

The sequence of entry is hour, minute, second.

SYSTem:VERSion?

This command queries the number of the SCPI version, which is relevant for the instrument.

Example: `"SYST:VERS?"`

Features: *RST value: –
SCPI: conforming

Modes: E, A, VA

This command is a query which is why it is not assigned an *RST value.

3.6.19 TRACe Subsystem

The TRACe subsystem controls access to the instrument's internal trace memory.

COMMAND	PARAMETERS	UNIT	COMMENT
TRACe			
[:DATA]	TRACE1 | TRACE2 | TRACE3 | TRACE4 | SINGle | SCAN | STATus, <block>|<numeric_value>...	-	
:COPY	TRACE1|TRACE2|TRACE3|TRACE4, TRACE1|TRACE2|TRACE3|TRACE4		
:FEED			
:CONTrol<1...4>	ALWays | NEVer		

TRACe[:DATA] TRACE1|TRACE2|TRACE3|TRACE4|SINGle|SCAN|STATus, <block> | <num_value>

This command transfers trace data from the controller to the instrument, the query reads trace data out of the instrument.

Example: `"TRAC TRACE1,"+A$  (A$: data list in the current format)`
`"TRAC? TRACE1"`

Features: *RST value: -
SCPI: conforming

Modes: E, A, VA

The trace data are transferred in the current format (corresponding to the command FORMat ASCii|REAL). The device-internal trace memory is addressed using the trace names 'TRACE1' to 'TRACE4'.
The parameter of the query is the trace name TRACE1 to TRACE4, it indicates which trace memory will be read out.
The transfer of trace data from the controller to the instrument takes place by indicating the trace name and then the data to be transferred. In ASCII format, these data are values separated by commas. If the transfer takes place using the format real (REAL 32), the data are transferred in block format.

Saving and recalling trace data to/from the device-internal hard disk or to/from a floppy is controlled via the commands "`MMEMory:STORe:TRACe`" and "`MMEMory:LOAD:TRACe`" respectively.

The transfer format for the trace data depends on the instrument setting

Analyzer mode (span >0 and zero span):

500 results are output in the unit selected for display.

Note: *With AUTO PEAK detector, only positive peak values can be read out.*
Trace data can be read into instrument with logarithmic display only in dBm, with linear display only in volts.

FORMAT REAL,32 is to be used as format for binary transmission.

Vector analyzer mode, digital demodulation

The number of data transferred (except for the symbol table) is determined by the following formula

number of results = result length * points per symbol

Max. 6400 results can be transferred (for example result length 1600, points per symbol 4).

In all cartesian diagrams (MAGNITUDE CAP BUFFER, MAGNITUDE, PHASE, FREQUENCY, REAL/IMAG, EYE[I], EYE[Q], ERROR VECT MAGNITUDE) test data are transferred in the unit selected for display.

FORMAT REAL,32 is to be used for binary transmission.

Note: *In the case of the eye pattern, results are simply superimposed in the display, ie the EYE representation is the same as the REAL/IMAG representation.*

In the polar diagrams (POLAR CONSTELL, POLAR VECTOR) the real and the imaginary component are transferred as a pair for each result.

FORMAT REAL,32 is to be used for binary transmission.

With the SYMB TABLES / ERRORS setting, the displayed symbols can be read out as traces. Trace assignment is as follows:

Full screen	Trace 1
Split screen, screen A:	Trace 1
Split screen, screen B:	Trace 2

One byte (8 bits) is read out for each symbol.

FORMAT UINT,8 is to be used for binary transmission.

Vector analyzer mode, analog demodulation

The number of results transferred depends on the SWEEP TIME and DEMOD BW settings. Max. 5000 and min. 10 points are available. The unit for the results depends on the selected demodulation:

AM	unit %
FM	unit Hz
PM	unit rad or deg

FORMAT REAL,32 is to be used for binary data transmission.

Receiver

SINGle is possible only as a query for single measurements in the receiver mode. The values of all activated detectors are transferred separated by commas in the following order: POS, RMS, AVER, QPE. For inactive detectors, the value and the comma are omitted at the position(s) in question.

SCAN is only possible in form of a query during scan measurements. The number of transmitted measurement results depends on the scan settings.
FORMAT REAL,32 is to be used as format setting for binary transmission.

Structure of transmitted data:
- 4 byte: trace status: bit 0 to 9 subscan; bit 10: last block of subscan; Bit 11: last block of last subscan of scan; Bit 12: last of all blocks (for multiple scans after the last scan)
- 4 bytes:number n of the transmitted measurement results of a trace
- 4 byte:trace1 active (0/1)
- 4 byte:trace2 active (0/1)
- 4 byte:trace3 active (0/1)
- 4 byte:trace4 active (0/1)
- n*4 bytes:measurement results of trace 1 if trace 1 is active
- n*4 bytes:measurement results of trace 2 if trace 2 is active
- n*4 bytes:measurement results of trace 3 if trace 3 is active

- n*4 bytes:measurement results of trace 4 if trace 4 is active
- n*1 byte:status information per measurement result:
  bit 0: underrange trace1; bit 1: underrange trace2; bit 2: underrange trace3;
  bit 3: underrange trace4; bit 4: overrange trace1 to trace4

STATus is only possible in form of a query during scan measurements. 1 byte status information per measurement result is transmitted:
bit 0: underrange trace1; bit 1: underrange trace2; bit 2: underrange trace3;
bit 3: underrange trace4; bit 4: overrange trace1 to trace4

TRACe:COPY TRACe:COPY TRACE1| TRACE2| TRACE3| TRACE4 ,
TRACE1| TRACE2| TRACE3| TRACE4

This command copies data from one trace to another. The second operand designates the source, the first operand the destination of the data to be copied.

Example: `"TRAC:COPY TRACE1,TRACE2"`

Features: *RST value:
SCPI: conforming

Modes: E, A, VA

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

TRACe:FEED:CONTrol<1 to 4> ALWays | NEVer

This command switches block data transmission during a scan on and off.

Example: `"TRAC:FEED:CONT ALW"`

Features: *RST Value: NEVer
SCPI: conforming

Mode: E

The block size dependens on the scan time, the trace number is not evaluated.

3.6.20 TRIGger Subsystem

The TRIGger subsystem is used to synchronize instrument actions with events. This makes it possible to control and synchronize the start of a sweep. An external trigger signal can be fed to the connector at the rear panel of the instrument. In split screen mode, a distinction is made between TRIGger1 (screen A) and TRIGger2 (screen B).

COMMAND	PARAMETERS	UNIT	COMMENT
TRIGger<1|2>			
[:SEQuence]			
:SOURce	IMMediate | LINE | EXTernal |VIDeo | RFPower | TV | AF	--	TV only with option TV Demodulator
:LEVel			
[:EXTernal]	<numeric_value>	V|MV|UV	
:VIDeo	<numeric_value>	PCT	
:HOLDoff	<numeric_value>	S	
:SLOPe	POSitive|NEGative	--	
:VIDeo			
:FORMat			
:LPFRame	525 | 625		Option TV Demodulator
:FIELd			
:SELect	ALL | ODD | EVEN		Option TV Demodulator
:LINE			
:NUMBer	<numeric_value>		Option TV Demodulator
:SSIGnal			
:POLarity	NEGative | POSitive		Option TV Demodulator

TRIGger<1|2>[:SEQuence]:SOURce IMMediate | LINE | EXTernal | VIDeo | RFPower | TV | AF

This command selects the trigger source for the start of a sweep.

Example: `"TRIG:SOUR EXT"`

Features: *RST value: IMMediate
SCPI: conforming

Modes: E, A, VA

The value IMMediate corresponds to the "FREE RUN" setting.
Selecting the parameter TV is possible only when the option TV-demodulator is fitted, the parameter AF only in the vector signal analysis mode with analog demodulation.

The value IMMediate corresponds to the "FREE RUN" setting.

TRIGger<1|2>[:SEQuence]:LEVel[:EXTernal] –5.0 to +5.0V

This command sets the level of the external trigger source.

Example: `"TRIG:LEV 2V"`

Features: *RST value: –5.0V
SCPI: conforming

Modes: E, A, VA

TRIGger<1|2>[:SEQuence]:LEVel:VIDeo 0 to 100PCT

This command sets the level of the video trigger source.

Example: `"TRIG:LEV:VID 50PCT"`

Features: *RST value: 50 PCT
SCPI: device-specific

Modes: E, A, VA

TRIGger<1|2>[:SEQuence]:HOLDoff -100 to 100s

This command defines the length of the trigger delay.

Example: `"TRIG:HOLD 500us"`

Features: *RST value: 0s
SCPI: conforming

Modes: A-Z, VA

A negative delay time (pretrigger) can be set in the time domain (SPAN < 0 Hz) only. The permissible range of the pretrigger is limited by the set sweep time (max = - 499/500 x sweep time). Pretriggering is not possible when the rms or the average detector is activated.

TRIGger<1|2>[:SEQuence]:SLOPe POSitive | NEGative

This command selects the slope of the trigger signal.

Example: `"TRIG:SLOP NEG"`

Features: *RST value: POSitive
SCPI: conforming

Modes: E, A, VA

The selected trigger slope applies to all trigger signal sources.

TRIGger<1|2>[:SEQuence]:VIDeo:FORMat:LPFRame 525 | 625

This command defines the number of lines per frame to be used (525 or 625 lines)

Example: `"TRIG:VID:FORM:LPFR 525"`

Features: *RST value:
SCPI: conforming

Mode: A-Z

This command is only valid if option FSE-B3, TV Demodulator, is fitted.

TRIGger<1|2>[:SEQuence]:VIDeo:LINE:NUMBer <numeric value>

This command selects the horizontal synchronizing signal for triggering.

Example: `"TRIG:VID:LINE:NUMB 17"`

Features: *RST value:
SCPI: conforming

Mode: A-Z

The instrument is triggered at the specified line. This command is only valid if option FSE-B3, TV Demodulator is fitted.

TRIGger<1|2>[:SEQuence]:VIDeo:FIELd:SELect ALL | ODD | EVEN

This command selects the vertical synchronizing signal for triggering.

Example: `"TRIG:VID:FIEL:SEL ALL"`

Features: *RST value:
SCPI: conforming

Mode: A-Z

With the parameter ALL, the instrument is triggered when the field is changed, irrespective of the half fields. With ODD, triggering by the first half field, with even, triggering by the second half field is selected. This command is valid only if option FSE-B3, TV Demodulator, is fitted.

TRIGger<1|2>[:SEQuence]:VIDeo:SSIGnal:POLarity NEGative | POSitive

This command defines the polarity of the video synchronizing signal.

Example: `"TRIG:VID:SSIG:POL NEG "`

Features: *RST value:
SCPI: conforming

Mode: A-Z

This command is valid only if option FSE-B3, TV Demodulator, is fitted.

3.6.21 UNIT Subsystem

The UNIT subsystem is used to switch the basic unit of setting parameters. In split screen mode, a distinction is made between UNIT1 (screen A) and UNIT2 (screen B).

COMMAND	PARAMETERS	UNIT	COMMENT
UNIT<1|2>			
:POWer	DBM | DBPW | DBPT | WATT | DBUV | DBMV | VOLT | DBUA | AMPere V | W | DB | PCT | UNITLESS | DBUV_MHZ | DBMV_MHZ | DBUA_MHZ | DBUV_M | DBUA_M | DBUV_MMHZ | DBUA_MMHZ		
:PROBe	<Boolean>		

UNIT<1|2>:POWer DBM | DBPW | DBPT | WATT | DBUV | DBMV | VOLT | DBUA | AMPere | V | W | DB | PCT | UNITLESS | DBUV_MHZ |DBMV_MHZ | DBUA_MHZ | DBUV_M | DBUA_M | DBUV_MMHZ | DBUA_MMHZ

This command selects the default unit for input and output.

Example: `"UNIT:POW DBUV"`

Features: *RST value: DBM
SCPI: conforming

Modes: E, A

UNIT<1|2>:PROBe ON | OFF

This command determines whether the coding of a probe which is connected to the front panel is taken into consideration (ON) or not (OFF).

Example: `"UNIT:PROB OFF"`

Features: *RST value: ON
SCPI: device-specific

Modes: E, A

3.7 Instrument Model and Command Processing

The instrument model shown in Fig. 3.7-1 has been made viewed from the standpoint of the servicing of IEC-bus commands. The individual components work independently of each other and simultaneously. They communicate by means of so-called "messages".

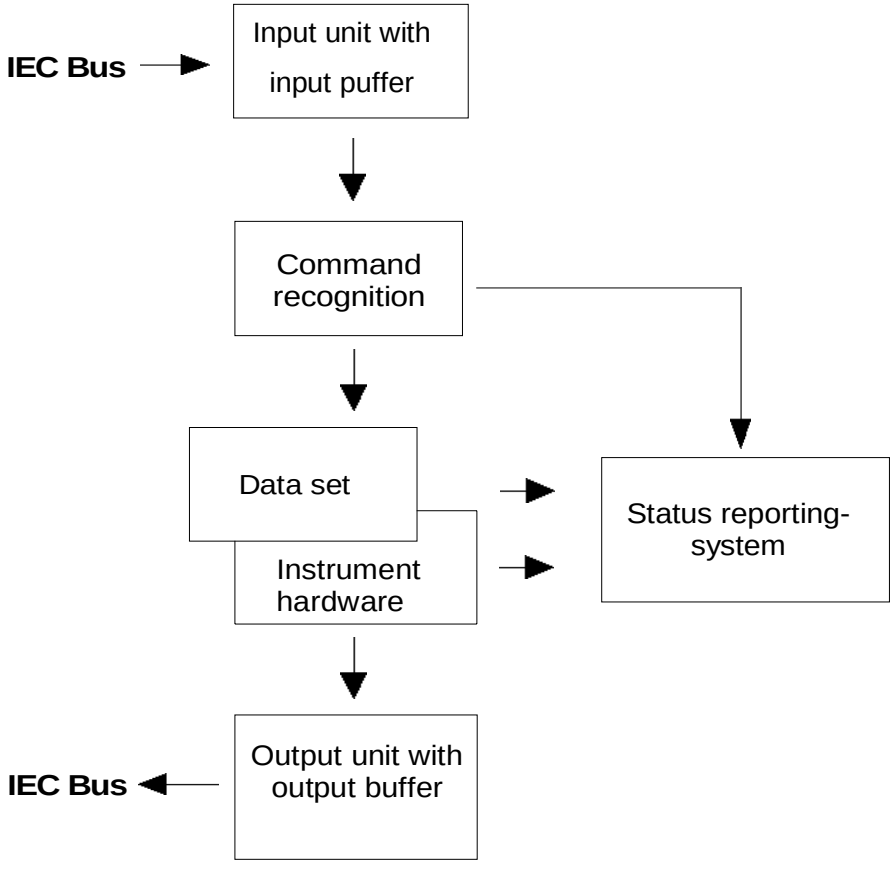


Fig. 3.7-1 Instrument model in the case of remote control by means of the IEC bus

3.7.1 Input Unit

The input unit receives commands character by character from the IEC bus and collects them in the input buffer. The input buffer has a size of 256 characters. The input unit sends a message to the command recognition as soon as the input buffer is full or as soon as it receives a delimiter, <PROGRAM MESSAGE TERMINATOR>, as defined in IEEE 488.2, or the interface message DCL.
If the input buffer is full, the IEC-bus traffic is stopped and the data received up to then are processed. Subsequently the IEC-bus traffic is continued. If, however, the buffer is not yet full when receiving the delimiter, the input unit can already receive the next command during command recognition and execution. The receipt of a DCL clears the input buffer and immediately initiates a message to the command recognition.

3.7.2 Command Recognition

The command recognition analyses the data received from the input unit. It proceeds in the order in which it receives the data. Only a DCL is serviced with priority, a GET (Group Execute Trigger), e.g., is only executed after the commands received before as well. Each recognized command is immediately transferred to the data set but without being executed there at once.
Syntactical errors in the command are recognized here and supplied to the status reporting system. The rest of a command line after a syntax error is analysed further if possible and serviced.
If the command recognition recognizes a delimiter or a DCL, it requests the data set to set the commands in the instrument hardware as well now. Subsequently it is immediately prepared to process commands again. This means for the command servicing that further commands can already be serviced while the hardware is still being set ("overlapping execution").

3.7.3 Data Set and Instrument Hardware

Here the expression "instrument hardware" denotes the part of the instrument fulfilling the actual instrument function - signal generation, measurement etc. The controller is not included.

The data set is a detailed reproduction of the instrument hardware in the software.

IEC-bus setting commands lead to an alteration in the data set. The data set management enters the new values (e.g. frequency) into the data set, however, only passes them on to the hardware when requested by the command recognition. As this is always only effected at the end of a command line, the order of the setting commands in the command line is not relevant.

The data are only checked for their compatibility among each other and with the instrument hardware immediately before they are transmitted to the instrument hardware. If the detection is made that an execution is not possible, an "execution error" is signalled to the status reporting system. All alterations of the data set are cancelled, the instrument hardware is not reset. Due to the delayed checking and hardware setting, however, it is permissible to set impermissible instrument states within one command line for a short period of time without this leading to an error message. At the end of the command line, however, a permissible instrument state must have been reached again.

Before passing on the data to the hardware, the settling bit in the STATus:OPERation register is set (cf. Section 3.8.3.4). The hardware executes the settings and resets the bit again as soon as the new state has settled. This fact can be used to synchronize command servicing.

IEC-bus queries induce the data set management to send the desired data to the output unit.

3.7.4 Status Reporting System

The status reporting system collects information on the instrument state and makes it available to the output unit on request. The exact structure and function are described in Section 3.8

3.7.5 Output Unit

The output unit collects the information requested by the controller, which it receives from the data set management. It processes it according to the SCPI rules and makes it available in the output buffer. The output buffer has a size of 4096 characters. If the information requested is longer, it is made available "in portions" without this being recognized by the controller.
If the instrument is addressed as a talker without the output buffer containing data or awaiting data from the data set management, the output unit sends error message "Query UNTERMINATED" to the status reporting system. No data are sent on the IEC bus, the controller waits until it has reached its time limit. This behaviour is specified by SCPI.

3.7.6 Command Sequence and Command Synchronization

What has been said above makes clear that all commands can potentially be carried out overlapping. Equally, setting commands within one command line are not absolutely serviced in the order in which they have been received.

In order to make sure that commands are actually carried out in a certain order, each command must be sent in a separate command line, that is to say, with a separate IBWRT()-call.
In order to prevent an overlapping execution of commands, one of commands *OPC, *OPC? or *WAI must be used. All three commands cause a certain action only to be carried out after the hardware has been set and has settled. By a suitable programming, the contoller can be forced to wait for the respective action to occur (cf. Table 3.7-1).

Table 3.7-1 Synchronisation using *OPC, *OPC? and *WAI

Commnd	**Action after the hardware has settled**	**Programming the controller**
*OPC	Setting the opteration-complete bit in the ESR	- Setting bit 0 in the ESE - Setting bit 5 in the SRE - Waiting for service request (SRQ)
*OPC?	Writing a "1" into the output buffer	Addressing the instrument as a talker
*WAI	Continuing the IEC-bus handshake	Sending the next command

An example as to command synchronization can be found in annex D "Program Examples".

3.8 Status Reporting System

The status reporting system (cf. Fig. 3.8-2) stores all information on the present operating state of the instrument, e.g. that the instrument presently carries out an AUTORANGE and on errors which have occurred. This information is stored in the status registers and in the error queue. The status registers and the error queue can be queried via IEC bus.

The information is of a hierarchical structure. The register status byte (STB) defined in IEEE 488.2 and its associated mask register service request enable (SRE) form the uppermost level. The STB receives its information from the standard event status register (ESR) which is also defined in IEEE 488.2 with the associated mask register standard event status enable (ESE) and registers STATus:OPERation and STATus:QUEStionable which are defined by SCPI and contain detailed information on the instrument.

The IST flag ("Individual STatus") and the parallel poll enable register (PPE) allocated to it are also part of the status reporting system. The IST flag, like the SRQ, combines the entire instrument status in a single bit. The PPE fulfills an analog function for the IST flag as the SRE for the service request.

The output buffer contains the messages the instrument returns to the controller. It is not part of the status reporting system but determines the value of the MAV bit in the STB and thus is represented in Fig. 3.8-2.

3.8.1 Structure of an SCPI Status Register

Each SCPI register consists of 5 parts which each have a width of 16 bits and have different functions (cf. Fig. 3.8-1). The individual bits are independent of each other, i.e. each hardware status is assigned a bit number which is valid for all five parts. For example, bit 3 of the STATus:OPERation register is assigned to the hardware status "wait for trigger" in all five parts. Bit 15 (the most significant bit) is set to zero for all parts. Thus the contents of the register parts can be processed by the controller as positive integer.

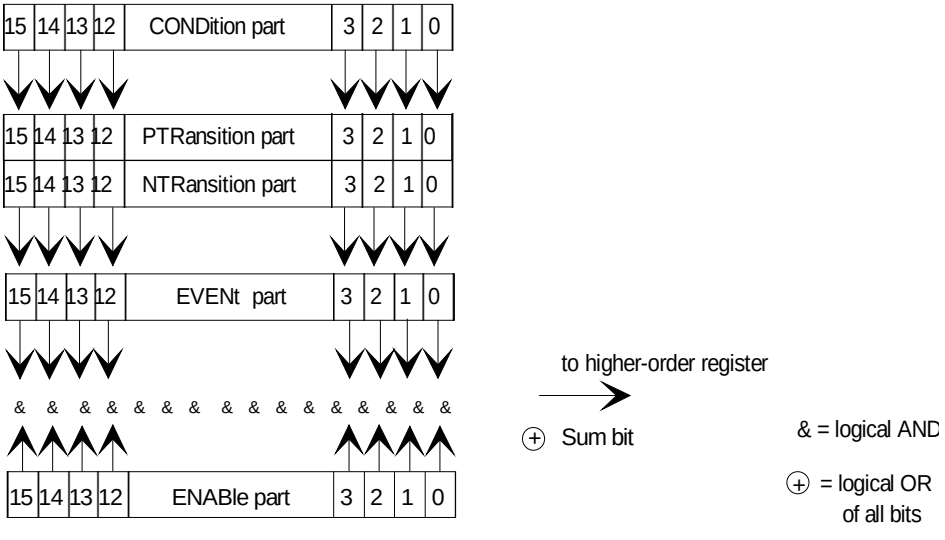


Fig. 3.8-1 The status-register model

CONDition part

The CONDition part is directly written into by the hardware or the sum bit of the next lower register. Its contents reflects the current instrument status. This register part can only be read, but not written into or cleared. Its contents is not affected by reading.

PTRansition part

The Positive-TRansition part acts as an edge detector. When a bit of the CONDition part is changed from 0 to 1, the associated PTR bit decides whether the EVENt bit is set to 1.
PTR bit =1: the EVENt bit is set.
PTR bit =0: the EVENt bit is not set.
This part can be written into and read at will. Its contents is not affected by reading.

NTRansition part

The Negative-TRansition part also acts as an edge detector. When a bit of the CONDition part is changed from 1 to 0, the associated NTR bit decides whether the EVENt bit is set to 1.
NTR-Bit = 1: the EVENt bit is set.
NTR-Bit = 0: the EVENt bit is not set.
This part can be written into and read at will. Its contents is not affected by reading.

With these two edge register parts the user can define which state transition of the condition part (none, 0 to 1, 1 to 0 or both) is stored in the EVENt part.

EVENt part

The EVENt part indicates whether an event has occurred since the last reading, it is the "memory" of the condition part. It only indicates events passed on by the edge filters. It is permanently updated by the instrument. This part can only be read by the user. During reading, its contents is set to zero. In linguistic usage this part is often equated with the entire register.

ENABle part

The ENABle part determines whether the associated EVENt bit contributes to the sum bit (cf. below). Each bit of the EVENt part is ANDed with the associated ENABle bit (symbol '&'). The results of all logical operations of this part are passed on to the sum bit via an OR function (symbol '+').
ENABle-Bit = 0: the associated EVENt bit does not contribute to the sum bit
ENABle-Bit = 1: if the associated EVENT bit is "1", the sum bit is set to "1" as well.
This part can be written into and read by the user at will. Its contents is not affected by reading.

Sum bit

As indicated above, the sum bit is obtained from the EVENt and ENABle part for each register. The result is then entered into a bit of the CONDition part of the higher-order register.
The instrument automatically generates the sum bit for each register. Thus an event, e.g. a PLL that has not locked, can lead to a service request throughout all levels of the hierarchy.

Note: *The service request enable register SRE defined in IEEE 488.2 can be taken as ENABle part of the STB if the STB is structured according to SCPI. By analogy, the ESE can be taken as the ENABle part of the ESR.*

3.8.2 Overview of the Status Registers

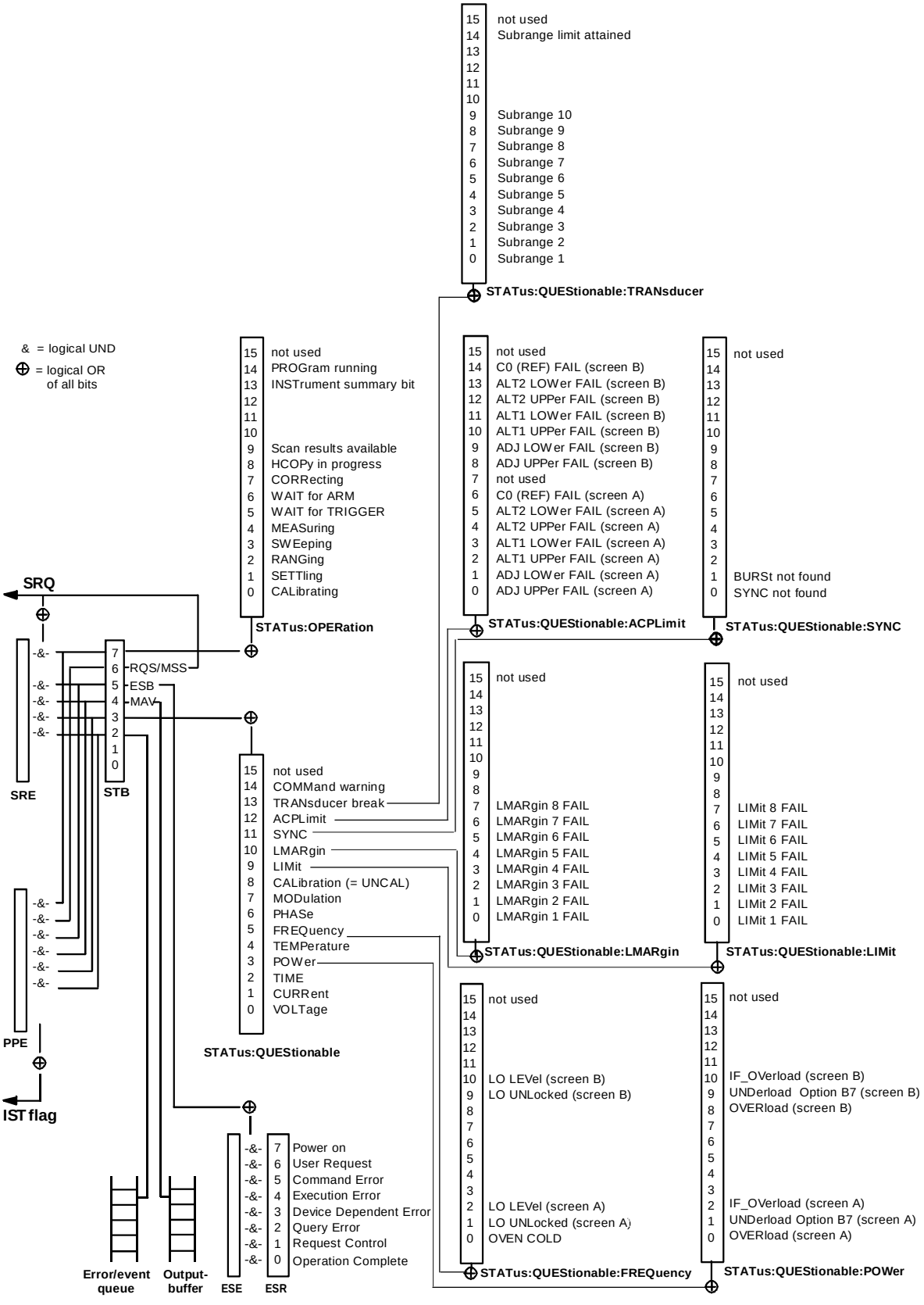


Fig. 3.8-2 Overview of the status registers

3.8.3 Description of the Status Registers

3.8.3.1 Status Byte (STB) and Service Request Enable Register (SRE)

The STB is already defined in IEEE 488.2. It provides a rough overview of the instrument status by collecting the pieces of information of the lower registers. It can thus be compared with the CONDition part of an SCPI register and assumes the highest level within the SCPI hierarchy. A special feature is that bit 6 acts as the sum bit of the remaining bits of the status byte.
The STATUS BYTE is read out using the command "*STB?" or a serial poll.

The STB implies the SRE. It corresponds to the ENABle part of the SCPI registers as to its function. Each bit of the STB is assigned a bit in the SRE. Bit 6 of the SRE is ignored. If a bit is set in the SRE and the associated bit in the STB changes from 0 to 1, a Service Request (SRQ) is generated on the IEC bus, which triggers an interrupt in the controller if this is appropriately configured and can be further processed there.
The SRE can be set using command "*SRE" and read using "*SRE?".

Table 3.8-1 Meaning of the bits in the status byte

Bit No.	Meaning
2	**Error Queue not empty** The bit is set when an entry is made in the error queue. If this bit is enabled by the SRE, each entry of the error queue generates a Service Request. Thus an error can be recognized and specified in greater detail by polling the error queue. The poll provides an informative error message. This procedure is to be recommended since it considerably reduces the problems involved with IEC-bus control.
3	**QUEStionable status sum bit** The bit is set if an EVENt bit is set in the QUEStionable-Status register and the associated ENABle bit is set to 1. A set bit indicates a questionable instrument status, which can be specified in greater detail by polling the QUEStionable-Status register.
4	**MAV bit** (message available) The bit is set if a message is available in the output buffer which can be read. This bit can be used to enable data to be automatically read from the instrument to the controller (cf. annex D, program examples).
5	**ESB bit** Sum bit of the event status register. It is set if one of the bits in the event status register is set and enabled in the event status enable register. Setting of this bit implies an error or an event which can be specified in greater detail by polling the event status register.
6	**MSS bit** (master status smmary bit) The bit is set if the instrument triggers a service request. This is the case if one of the other bits of this registers is set together with its mask bit in the service request enable register SRE.
7	**OPERation status register sum bit** The bit is set if an EVENt bit is set in the OPERation-Status register and the associated ENABle bit is set to 1. A set bit indicates that the instrument is just performing an action. The type of action can be determined by polling the OPERation-status register.

3.8.3.2 IST Flag and Parallel Poll Enable Register (PPE)

By analogy with the SRQ, the IST flag combines the entire status information in a single bit. It can be queried by means of a parallel poll (cf. Section 3.8.4.3) or using command "*IST?".

The parallel poll enable register (PPE) determines which bits of the STB contribute to the IST flag. The bits of the STB are ANDed with the corresponding bits of the PPE, with bit 6 being used as well in contrast to the SRE. The Ist flag results from the ORing of all results. The PPE can be set using commands "*PRE" and read using command "*PRE?".

3.8.3.3 Event-Status Register (ESR) and Event-Status-Enable Register (ESE)

The ESR is already defined in IEEE 488.2. It can be compared with the EVENt part of an SCPI register. The event status register can be read out using command "*ESR?".
The ESE is the associated ENABle part. It can be set using command "*ESE" and read using command "*ESE?".

Table -3.8-2 Meaning of the bits in the event status register

Bit No.	Meaning
0	**Operation Complete** This bit is set on receipt of the command *OPC exactly when all previous commands have been executed.
1	**Request Control** This bit is set if the instrument requests the controller function. This is the case when hardcopy is outputted to a printer or a plotter via the IEC-bus.
2	**Query Error** This bit is set if either the controller wants to read data from the instrument without having send a query, or if it does not fetch requested data and sends new instructions to the instrument instead. The cause is often a query which is faulty and hence cannot be executed.
3	**Device-dependent Error** This bit is set if a device-dependent error occurs. An error message with a number between -300 and -399 or a positive error number, which denotes the error in greater detail, is entered into the error queue (cf. annex B, Error Messages).
4	**Execution Error** This bit is set if a received command is syntactically correct, however, cannot be performed for other reasons. An error message with a number between -200 and -300, which denotes the error in greater detail, is entered into the error queue (cf. annex B, Error Messages).
5	**Command Error** This bit is set if a command which is undefined or syntactically incorrect is received. An error message with a number between -100 and -200, which denotes the error in greater detail, is entered into the rror queue (cf. annex B, -Error Messages).
6	**User Request** This bit is set on pressing the *LOCAL* key.
7	**Power On** (supply voltage on) This bit is set on switching on the instrument.

3.8.3.4 STATus:OPERation Register

In the CONDition part, this register contains information on which actions the instrument is being executing or, in the EVENt part, information on which actions the instrument has executed since the last reading. It can be read using commands `"STATus:OPERation:CONDition?"` or `"STATus :OPERation[:EVENt]?"`.

Table 3.8-3 Meaning of the bits in the STATus.OPERation register

Bit No.	Meaning
0	**CALibrating** This bit is set as long as the instrument is performing a calibration.
1	**SETTling** This bit is set as long as the new status is settling after a setting command. It is only set if the settling time is longer than the command processing time.
2	**RANGing** This bit is set as long as the instrument is changing a range (e.g. Autorange).
3	**SWEeping** This bit is set while the instrument is performing a sweep.
4	**MEASuring** This bit is set while the instrument is performing a measurement.
5	**WAIT for TRIGGER** This bit is set as long as the instrument is waiting for a trigger event.
6	**WAIT for ARM** This bit is set as long as the instrument is waiting for an arming event.
7	**CORRecting** This bit is set while the instrument is performing a correction.
8	**HardCOPy in progress** This bit is set while the instrument is printing a hardcopy.
9	**Scan Results available** (device dependent) This bit is set as soon as a data block is ready for output during a scan.
10-12	Device dependent
13	**INSTrument Summary Bit** This bit is set when one or more logical instruments is reporting a status message.
14	**PROGram running** This bit is set while the instrument is performing a program.
15	This bit is always 0

The ESI supports bits 0, 8, and 9 .

3.8.3.5 STATus:QUEStionable Register

This register comprises information about indefinite states which may occur if the unit is operated without meeting the specifications. It can be queried by commands `STATus:QUEStionable:CONDition?` and `STATus:QUEStionable[:EVENt]?`.

Table 3.8-4 Meaning of bits in STATus:QUEStionable register

Bit No.	Meaning
0	**VOLTage** This bit is set if a questionable voltage occurs.
1	**CURRent** This bit is set if a questionable current occurs.
2	**TIME** This bit is set if a questionable time occurs.
3	**POWer** This bit is set if a questionable power occurs (cf. also section "STATus:QUEStionable:POWerRegister")
4	**TEMPerature** This bit is set if a questionable temperature occurs.
5	**FREQuency** The bit is set if a frequency is questionable (cf. section "STATus:QUEStionable:FREQuency Register")
6	**PHASe** The bit is set if a phase value is questionable.
7	**MODulation** The bit is set if a modulation is performed questionably.
8	**CALibration** The bit is set if a measurement is performed uncalibrated ($\triangleq$ label "UNCAL")
9	**LIMit** (unit-dependent) This bit is set if a limit value is violated (see also section STATus:QUEStionable:LIMit Register)
10	**LMARgin** (unit-dependent) This bit is set if a margin is violated (see also section STATus:QUEStionable:LMARgin Register)
11	**SYNC** (unit-dependent) This bit is set if, during measurements with Option B7 (Signal Vector Analysis), the synchronization with midamble or a successful search for bursts cannot be performed (see also STATus:QUEStionable:SYNC Register)
12	**ACPLimit** (unit-dependent) This bit is set if a limit for the adjacent channel power measurement is violated (see also section STATus:QUEStionable:ACPLimit Register)
13	**TRANsducer break** This bit is set when the limit of the transducer set subrange is attained.
14	**COMMand Warning** This bit is set if the instrument ignores parameters when executing a command.
15	This bit is always 0.

The ESI supports bits 3, 5, 7, 8, 9, 10, 11, 12 and 13, bits 7 (MODulation) and 11 (SYNC) only with option FSE-B7, Vector Signal Analysis.'.

3.8.3.6 STATus QUEStionable:ACPLimit Register

This register comprises information about the observance of limits during adjacent power measurements. It can be queried with commands 'STATus:QUEStionable:ACPLimit :CONDition?' and 'STATus:QUEStionable:ACPLimit[:EVENt]?'

Table 3.8-5 Meaning of bits in STATus:QUEstionable:ACPLimit register

Bit No.	Meaning
0	**ADJ UPPer FAIL(Screen A)** This bit is set if the limit is exceeded in the upper adjacent channel.
1	**ADJ LOWer FAIL (Screen A)** This bit is set if the limit is exceeded in the lower adjacent channel.
2	**ALT1 UPPer FAIL (Screen A)** This bit is set if the limit is exceeded in the upper 1st alternate channel.
3	**ALT1 LOWer FAIL (Screen A)** This bit is set if the limit is exceeded in the lower 1st alternate channel.
4	**ALT2 UPPer FAIL (Screen A)** This bit is set if the limit is exceeded in the upper 2nd alternate channel.
5	**ALT2 LOWer FAIL (Screen A)** This bit is set if the limit is exceeded in the lower 2nd alternate channel.
6	not used
7	**C0 (REF) FAIL (Screen A)** This bit is set if the limit is exceeded in the reference channel.
8	**ADJ UPPer FAIL (Screen B)** This bit is set if the limit is exceeded in the upper adjacent channel.
9	**ADJ LOWer FAIL (Screen B)** This bit is set if the limit is exceeded in the lower adjacent channel.
10	**ALT1 UPPer FAIL (Screen B)** This bit is set if the limit is exceeded in the upper 1st alternate channel.
11	**ALT1 LOWer FAIL (Screen B)** This bit is set if the limit is exceeded in the lower 1st alternate channel.
12	**ALT2 UPPer FAIL (Screen B)** This bit is set if the limit is exceeded in the upper 2nd alternate channel.
13	**ALT2 LOWer FAIL (Screen A)** This bit is set if the limit is exceeded in the lower 2nd alternate channel.
14	not used
15	**C0 (REF) FAIL (Screen B)** This bit is set if the limit is exceeded in the reference channel.

3.8.3.7 STATus QUEStionable:FREQuency Register

This register comprises information about the reference and local oscillator.
It can be queried with commands `STATus:QUEStionable:FREQuency:CONDition?` and "`STATus:QUEStionable:FREQuency[:EVENt]?`.

Table 3.8-6 Meaning of bits in STATus:QUEstionable:FREQuency register

Bit No.	Meaning
0	**OVEN COLD** This bit is set if the reference oscillator has not yet attained its operating temperature. 'OCXO' will then be displayed.
1	**LO UNLocked** (Screen A) This bit is set if the local oscillator no longer locks. 'LO unl' will then be displayed.
2	**LO LEVel** (Screen A**)** This bit is set if the level of the local oscillator is smaller than the nominal value. 'LO LVL' will then be displayed.
3	not used
4	not used
5	not used
6	not used
7	not used
8	not used
9	**LO UNLocked** (Screen B) This bit is set if the local oscillator no longer locks.' LO unl' will then be displayed.
10	**LO LEVel** (Screen B**)** This bit is set if the level of the local oscillator is smaller than the nominal value. 'LO LVL' will then be displayed.
11	not used
12	not used
13	not used
14	not used
15	This bit is always 0.

3.8.3.8 STATus QUEStionable:LIMit Register

This register comprises information about the observance of limit lines. It can be queried with commands `STATus:QUEStionable:LIMit:CONDition?` and `STATus:QUEStionable:LIMit[:EVENt]?`.

Table3.8-7 Meaning of bits in STATus:QUEstionable:LIMit register

Bit No.	Meaning
0	**LIMit 1 FAIL** This bit is set if limit line 1 is violated.
1	**LIMit 2 FAIL** This bit is set if limit line 2 is violated.
2	**LIMit 3 FAIL** This bit is set if limit line 3 is violated.
3	**LIMit 4 FAIL** This bit is set if limit line 4 is violated.
4	**LIMit 5 FAIL** This bit is set if limit line 5 is violated.
5	**LIMit 6 FAIL** This bit is set if limit line 6 is violated.
6	**LIMit 7 FAIL** This bit is set if limit line 7 is violated.
7	**LIMit 8 FAIL** This bit is set if limit line 8 is violated.
8	not used
9	not used
10	not used
11	not used
12	not used
13	not used
14	not used
15	This bit is always 0.

3.8.3.9 STATus QUEStionable:LMARgin Register

This register comprises information about the observance of limit margins. It can be queried with commands `STATus:QUEStionable:LMARgin:CONDition?` and "`STATus:QUEStionable :LMARgin[:EVENt]?`.

Table3.8-8 Meaning of bits in STATus: QUEstionable:LMARgin register

Bit No.	Meaning
0	**LMARgin 1 FAIL** This bit is set if limit margin 1 is violated.
1	**LMARgin 2 FAIL** This bit is set if limit margin 2 is violated.
2	**LMARgin 3 FAIL** This bit is set if limit margin 3 is violated.
3	**LMARgin 4 FAIL** This bit is set if limit margin 4 is violated.
4	**LMARgin 5 FAIL** This bit is set if limit margin 5 is violated.
5	**LMARgin 6 FAIL** This bit is set if limit margin 1 is violated.
6	**LMARgin 7 FAIL** This bit is set if limit margin 7 is violated.
7	**LMARgin 8 FAIL** This bit is set if limit margin 8 is violated.
8	not used
9	not used
10	not used
11	not used
12	not used
13	not used
14	not used
15	This bit is always 0.

3.8.3.10 STATus QUEStionable:POWer Register

This register comprises all information about possible overloads of the unit.
It can be queried with commands `STATus:QUEStionable :POWer:CONDition?` and `"STATus :QUEStionable:POWer [:EVENt]?`.

Table3.8-9 Meaning of bits in STATus:QUEstionable:POWer register

Bit No.	Meaning
0	**OVERload** (Screen A) This bit is set if the RF input is overloaded. 'OVLD' will then be displayed.
1	**UNDerload** (Screen A) - Option FSE-B7 This bit is set if, during measurements in vector analyzer mode without capture buffer used, the lower level limit in the IF path is violated.
2	**IF_OVerload** (Screen A) This bit is set if the IF path is overloaded. 'IFOVLD' will then be displayed.
3	not used
4	not used
5	not used
6	not used
7	not used
8	**OVERload** (Screen B) This bit is set if the RF input is overloaded. 'OVLD' will then be displayed.
9	**UNDerload** (Screen B) - Option FSE-B7 This bit is set if, during measurements without capture buffer used, the lower level limit in the IF path is violated.
10	**IF_OVerload** (Screen B) This bit is set if the IF path is overloaded. 'IFOVLD' will then be displayed.
11	not used
12	not used
13	not used
14	not used
15	This bit is always 0.

3.8.3.11 STATus QUEStionable:SYNC Register

This register comprises information about sync and burst events.
It can be queried with commands `STATus:QUEStionable:SYNC:CONDition?` and `"STATus :QUEStionable:SYNC[:EVENt]?`.

Table 3.8-10 Meaning of bits in STATus: QUEstionable:SYNC register

Bit No.	Meaning
0	**SYNC not found** This bit is set if the sync sequence of midamble was not found.
1	**BURSt not found** This bit is set if a burst was not found.
2	not used
3	not used
4	not used
5	not used
6	not used
7	not used
8	not used
9	not used
10	not used
11	not used
12	not used
13	not used
14	not used
15	This bit is always 0.

3.8.3.12 STATus QUEStionable:TRANsducer Register

This register indicates that a transducer hold point is attained (bit 15) and what range is to be swept next (bit 0 to 10). The sweep can be continued with command `INITiate:CONMeasure`.
It can be queried with commands `STATus:QUEStionable:TRANsducer:CONDition?` and "`STATus:QUEStionable:TRANsducer[:EVENt]?`.

Table 3.8-11 Meaning of bits in STATus: QUEstionable:TRANsducer register

Bit No.	Meaning
0	**Range 1** This bit is set when subrange 1 is attained.
1	**Range 2** This bit is set when subrange 2 is attained.
2	**Range 3** This bit is set when subrange 3 is attained.
3	**Range 4** This bit is set when subrange 4 is attained.
4	**Range 5** This bit is set when subrange 1 is attained.
5	**Range 6** This bit is set when subrange 6 is attained.
6	**Range 7** This bit is set when subrange 7 is attained.
7	**Range 8** This bit is set when subrange 8 is attained.
8	**Range 9** This bit is set when subrange 9 is attained.
9	**Range 10** This bit is set when subrange 10 is attained.
10	**not used**
11	**not used**
12	**not used**
13	**not used**
14	**Subrange limit** This bit is set when the transducer is at the point of changeover from one range to another.
15	This bit is always 0.

3.8.4 Application of the Status Reporting Systems

In order to be able to effectively use the status reporting system, the information contained there must be transmitted to the controller and further processed there. There are several methods which are represented in the following. Detailed program examples are to be found in annex D, Program Examples.

3.8.4.1 Service Request, Making Use of the Hierarchy Structure

Under certain circumstances, the instrument can send a service request (SRQ) to the controller. Usually this service request initiates an interrupt at the controller, to which the control program can react with corresponding actions. As evident from Fig. 3.8-1 (Section 3.8.2), an SRQ is always initiated if one or several of bits 2, 3, 4, 5 or 7 of the status byte are set and enabled in the SRE. Each of these bits combines the information of a further register, the error queue or the output buffer. The corresponding setting of the ENABle parts of the status registers can achieve that arbitrary bits in an arbitrary status register initiate an SRQ. In order to make use of the possibilities of the service request, all bits should be set to "1" in enable registers SRE and ESE.

Examples (cf. Fig. 3.8-1 and annex D, Program Examples, as well):

Use of command "*OPC" to generate an SRQ at the end of a sweep.

- Set bit 0 in the ESE (Operation Complete)
- Set bit 5 in the SRE (ESB)?

  After its settings have been completed, the instrument generates an SRQ.

The SRQ is the only possibility for the instrument to become active on its own. Each controller program should set the instrument such that a service request is initiated in the case of malfunction. The program should react appropriately to the service request. A detailed example for a service request routine is to be found in annex D, Program Examples.

3.8.4.2 Serial Poll

In a serial poll, just as with command "*STB", the status byte of an instrument is queried. However, the query is realized via interface messages and is thus clearly faster. The serial-poll method has already been defined in IEEE 488.1 and used to be the only standard possibility for different instruments to poll the status byte. The method also works with instruments which do not adhere to SCPI or IEEE 488.2.

The quick-BASIC command for executing a serial poll is "IBRSP()". Serial poll is mainly used to obtain a fast overview of the state of several instruments connected to the IEC bus.

3.8.4.3 Parallel Poll

In a parallel poll, up to eight instruments are simultaneously requested by the controller by means of a single command to transmit 1 bit of information each on the data lines, i.e., to set the data line allocated to each instrument to logically "0" or "1". By analogy to the SRE register which determines under which conditions an SRQ is generated, there is a parallel poll enable register (PPE) which is ANDed with the STB bit by bit as well considering bit 6. The results are ORed, the result is then sent (possibly inverted) as a response in the parallel poll of the controller. The result can also be queried without parallel poll by means of command "*IST".

The instrument first has to be set for the parallel poll using quick-BASIC command "IBPPC()". This command allocates a data line to the instrument and determines whether the response is to be inverted. The parallel poll itself is executed using "IBRPP()".

The parallel-poll method is mainly used in order to quickly find out after an SRQ which instrument has sent the service request if there are many instruments connected to the IEC bus. To this effect, SRE and PPE must be set to the same value. A detailed example as to the parallel poll is to be found in annex D, Program Examples.

3.8.4.4 Query by Means of Commands

Each part of every status register can be read by means of queries. The individual commands are indicated in the detailed description of the registers in Section 3.8.3. What is returned is always a number which represents the bit pattern of the register queried. Evaluating this number is effected by the controller program.

Queries are usually used after an SRQ in order to obtain more detailed information on the cause of the SRQ.

3.8.4.5 Error-Queue Query

Each error state in the instrument leads to an entry in the error queue. The entries of the error queue are detailed plain-text error messages which can be looked at in the ERROR menu via manual control or queried via the IEC bus using command "SYSTem:ERRor?". Each call of "SYSTem:ERRor?" provides an entry from the error queue. If no error messages are stored there any more, the instrument responds with 0, "No error".

The error queue should be queried after every SRQ in the controller program as the entries describe the cause of an error more precisely than the status registers. Especially in the test phase of a controller program the error queue should be queried regularly since faulty commands from the controller to the instrument are recorded there as well.

3.8.5 Resetting Values of the Status Reporting System

Table 3.8-12 comprises the different commands and events causing the status reporting system to be reset. None of the commands, except for *RST and SYSTem:PRESet influences the functional instrument settings. In particular, DCL does not change the instrument settings.

Table 3.8-12 Resettting instrument functions

Event / Effect	Switching on supply voltage: Power-On-Status-Clear 0	Switching on supply voltage: Power-On-Status-Clear 1	DCL,SDC (Device Clear, Selected Device Clear)	*RST or SYSTem:PRESet	STATus:PRESet	*CLS
Clear STB,ESR	—	yes	—	—	—	yes
Clear SRE,ESE	—	yes	—	—	—	—
Clear PPE	—	yes	—	—	—	—
Clear EVENTt parts of the registers	—	yes	—	—	—	yes
Clear Enable parts of all OPERation and QUEStionable registers, Fill Enable parts of all other registers with "1".	—	yes	—	—	yes	—
Fill PTRansition parts with "1" , Clear NTRansition parts	—	yes	—	—	yes	—
Clear error queue	yes	yes	—	—	—	yes
Clear output buffer	yes	yes	yes	1)	1)	1)
Clear command processing and input buffer	yes	yes	yes	—	—	—

1) Every command being the first in a command line, i.e., immediately following a <PROGRAM MESSAGE TERMINATOR> clears the output buffer.

3.9 Table of Softkeys with IEC/IEEE-Bus Command Assignment

3.9.1 Basic Instrument - Receiver Mode

3.9.1.1 CONFIGURATION Key Group

MODE	
EMI RECEIVER	INSTrument[:SELect] RECeiver
RECEIVER FREQUENCY	[SENSe:]FREQuency[:CW|FIXed] <numeric_value>
ATTEN	--
RF ATTEN MANUAL	INPut:ATTenuation <numeric_value>
0 DB MIN ON OFF	INPut:ATTenuation:PROTection ON|OFF
AUTO RANGE ON OFF	INPut:ATTenuation:AUTO ON|OFF
AUTOPREAMP ON OFF	INPut:GAIN:AUTO ON|OFF
PREAMP ON OFF	INPut:GAIN:STATe ON|OFF
RES BW	[SENSe:]BANDwidth:RESolution <numeric_value>
DETECTOR	--
PEAK	[SENSe:]DETector:RECeiver[:FUNCtion] POSitive
QUASI PEAK	[SENSe:]DETector:RECeiver[:FUNCtion] QPEak
AVERAGE	[SENSe:]DETector:RECeiver[:FUNCtion] AVERage
RMS	[SENSe:]DETector:RECeiver[:FUNCtion] RMS
MEAS TIME	[SENSe:]SWEep:TIME <numeric_value>
DEMOD	--
DEMOD ON OFF	[SENSe:]DEMod OFF (DEModulation ON automatically switched on with AM|FM)
AM	[SENSe:]DEMod AM
FM	[SENSe:]DEMod FM

DEFINE SCAN	--
SCAN TABLE	[SENSe:]FREQuency:STARt <numeric_value> [SENSe:]FREQuency:STOP <numeric_value> [SENSe:]SWEep:SPACing LINear | LOGarithmic | AUTO DISPlay[:WINDow<1|2>]:TRACe:Y[:SCALe]:TOP <numeric_value> DISPlay[:WINDow<1|2>]:TRACe:Y[:SCALe]:BOTTom <numeric_value> DISPlay[:WINDow<1|2>]:TRACe:X:SPACing LINear | LOGarithmic
ADJUST AXIS	--
SINGLE SCAN	INITiate2:CONTinuous OFF; INITiate[:IMMediate]
CONTINUOUS SCAN	INITiate2:CONTinuous ON; INITiate[:IMMediate]
SCAN RANGES	[SENSe:]SCAN<1...10>:RANGes[:COUNt] 1 ... 10 [SENSe:]SCAN<1...10>:STARt <numeric_value> [SENSe:]SCAN<1...10>:STOP <numeric_value> [SENSe:]SCAN<1...10>:STEP <numeric_value> [SENSe:]SCAN<1...10>:BANDwidth:RESolution <numeric_value> [SENSe:]SCAN<1...10>:TIME <numeric_value> [SENSe:]SCAN<1...10>:INPut:ATTenuation:AUTO <numeric_value> [SENSe:]SCAN<1...10>:INPut:ATTenuation <numeric_value> [SENSe:]SCAN<1...10>:INPut:GAIN <numeric value> [SENSe:]SCAN<1...10>:INPut:GAIN:AUTO ON | OFF [SENSe:]SCAN<1...10>:INPut:TYPE INPUT1 | INPUT2
INS BEFORE RANGE	--
INS AFTER RANGE	--
DELETE RANGE	--
RANGE 1-5 6-10	--
RUN SCAN	INITiate2[:IMMediate]
HOLD SCAN	HOLD
STOP SCAN	ABORt
RUN SCAN	INITiate2[:IMMediate]-
HOLD SCAN	HOLD
STOP SCAN	ABORt

3.9.1.2 FREQUENCY Key Group

START	[SENSe:]FREQuency:STARt <numeric_value>
STOP	[SENSe:]FREQuency:STOP <numeric_value>
CENTER/ FREQ	[SENSe:]FREQuency:CENTer <numeric_value>
STEP	
STEPSIZE MANUAL	[SENSe:]FREQuency:CENTer:STEP <numeric_value>
STEPSIZE = CENTER	ohne Funktion im IEC-Bus-Betrieb
SPAN/ ZOOM	--

3.9.1.3 LEVEL Key Group

REF/ UNIT	
dBµV	CALCulate<1|2>:UNIT:POWer DBMV
dBm	CALCulate<1|2>:UNIT:POWer DBM
dBµA	CALCulate<1|2>:UNIT:POWer DBUA
dBpW	CALCulate<1|2>:UNIT:POWer DBPW
dBpT	CALCulate<1|2>:UNIT:POWer DBPT
dBµV/m	CALCulate<1|2>:UNIT:POWer DBUV_M
dBµA/m	CALCulate<1|2>:UNIT:POWer DBUA_M
PROBE CODE ON / OFF	UNIT:PROBe ON|OFF

RANGE

LOG 120 dB	DISPlay[:WINDow]:TRACe:Y[:SCALe] 120
LOG 100 dB	DISPlay[:WINDow]:TRACe:Y[:SCALe] 100
LOG 50 dB	DISPlay[:WINDow]:TRACe:Y[:SCALe] 50
LOG 20 dB	DISPlay[:WINDow]:TRACe:Y[:SCALe] 20
LOG 10 dB	DISPlay[:WINDow]:TRACe:Y[:SCALe] 10
LOG MANUAL	DISPlay[:WINDow]:TRACe:Y[:SCALe] <numeric_value>
GRID MAX LEVEL	DISPlay[:WINDow]:TRACe:Y[:SCALe]:TOP <numeric_value>
GRID MIN LEVEL	DISPlay[:WINDow]:TRACe:Y[:SCALe]:BOTTom <numeric_value>

3.9.1.4 INPUT Key

RF ATTEN MANUAL	INPut:ATTenuation <numeric_value>
0 DB MIN ON OFF	INPut:ATTenuation:PROTection ON | OFF
AUTO RANGE ON OFF	INPut:ATTenuation:AUTO ON | OFF
AUTOPREAMP ON OFF	INPut:GAIN:AUTO ON | OFF
PREAMP ON OFF	INPut:GAIN:STATe ON | OFF
INPUT 1	INPut:TYPE INPUT1
INPUT 2	INPut:TYPE INPUT2
INPUT 2 AC COUPLED	INPut:COUPling AC
INPUT 2 DC COUPLED	INPut:COUPling DC

3.9.1.5 MARKER Key Group

NORMAL

MARKER 1..4	CALCulate<1|2>:MARKer<1...4>[:STATe] ON | OFF; CALCulate<1|2>:MARKer<1...4>:X <numeric value>; CALCulate<1|2>:MARKer<1...4>:Y?
MARKER INFO	DISPlay:WINDow<1|2>:MINFo ON | OFF (indication)
ALL MARKER OFF	CALCulate<1|2>:MARKer<1...4>:AOFF

STEP

STEPSIZE AUTO	CALCulate<1|2>:MARKer<1...4>:STEP:AUTO ON | OFF
STEPSIZE MANUAL	CALCulate<1|2>:MARKer<1...4>:STEP[:INCRement] <numeric_value>
MKR TO STEPSIZE	CALCulate<1|2>:MARKer<1...4>:FUNCtion:MSTep
DELTA TO STEPSIZE	--

DELTA

DELTA 1...4	CALCulate<1|2>:DELTamarker<1...4>[:STATe] ON | OFF CALCulate<1|2>:DELTamarker<1...4>:X <numeric value> CALCulate<1|2>:DELTamarker<1...4>:X:RELative? CALCulate<1|2>:DELTamarker<1...4>:Y?
REFERENCE POINT	--
REF POINT LEVEL	CALCulate<1|2>:DELTamarker<1..4>:FUNCtion:FIXed:RPOint:Y <num_value>
REF POINT LVL OFFSET	CALCulate<1|2>:DELTamarker<1..4>:FUNCtion:FIXed:RPOint:Y:OFFSet <num_value>
REF POINT FREQUENCY	CALCulate<1|2>:DELTamarker<1..4>:FUNCtion:FIXed:RPOint:X <num_value>
REFERENCE FIXED	CALCulate<1|2>:DELTamarker<1...4>:FUNCtion:FIXed[:STATe] ON | OFF
DELTA MKR ABS REL	CALCulate<1|2>:DELTamarker<1...4>:MODE ABSolute | RELative
ALL DELTA OFF	CALCulate<1|2>:DELTamarker<1...4>:AOFF

SEARCH

STEPSIZE AUTO	CALCulate<1|2>:DELTamarker<1...4>:STEP:AUTO ON | OFF

MANUAL STEPSIZE	CALCulate<1|2>:DELTamarker<1...4>:STEP[:INCRement] <numeric_value>
DELTA TO STEPSIZE	--

SEARCH

PEAK	CALCulate<1|2>:MARKer<1...4>:MAXimum[:PEAK] CALCulate<1|2>:DELTamarker<1...4>:MAXimum[:PEAK]
NEXT PEAK	CALCulate<1|2>:MARKer<1...4>:MAXimum:NEXT CALCulate<1|2>:DELTamarker<1...4>:MAXimum:NEXT
NEXT PEAK RIGHT	CALCulate<1|2>:MARKer<1...4>:MAXimum:RIGHt CALCulate<1|2>:DELTamarker<1...4>:MAXimum:RIGHt
NEXT PEAK LEFT	CALCulate<1|2>:MARKer<1...4>:MAXimum:LEFT CALCulate<1|2>:DELTamarker<1...4>:MAXimum:LEFT
SEARCH LIM ON/OFF	CALCulate<1|2>:MARKer<1...4>:X:SLIMits[STATe] ON | OFF
SELECT MARKER	no corresponding IEC/IEEE-bus command
ACTIVE MKR/DELTA	no corresponding IEC/IEEE-bus command
MIN	CALCulate<1|2>:MARKer<1...4>:MINimum[:PEAK] CALCulate<1|2>:DELTamarker<1...4>:MINimum[:PEAK]
NEXT MIN	CALCulate<1|2>:MARKer<1...4>:MINimum:NEXT CALCulate<1|2>:DELTamarker<1...4>:MINimum:NEXT
NEXT MIN RIGHT	CALCulate<1|2>:MARKer<1...4>:MINimum:RIGHt CALCulate<1|2>:DELTamarker<1...4>:MINimum:RIGHt
NEXT MIN LEFT	CALCulate<1|2>:MARKer<1...4>:MINimum:LEFT CALCulate<1|2>:DELTamarker<1...4>:MINimum:LEFT
PEAK EXCURSION	CALCulate<1|2>:MARKer<1...4>:PEXCursion <numeric_value>

MKR->

PEAK	CALCulate<1|2>:MARKer<1...4>:MAXimum[:PEAK] CALCulate<1|2>:DELTamarker<1...4>:MAXimum[:PEAK]
TUNE TO MARKER	CALCulate<1|2>:MARKer<1...4>:FUNCtion:CENTer
MKR-> STEPSIZE	CALCulate<1|2>:MARKer<1...4>:FUNCtion:CSTep
MKR-> TRACE	CALCulate<1|2>:MARKer<1...4>:TRACe <numeric value> CALCulate<1|2>:DELTamarker<1...4>:TRACe <numeric value>
SELECT MARKER	no corresponding IEC/IEEE-bus command
ACTIVE MKR/DELTA	no corresponding IEC/IEEE-bus command

3.9.1.6 LINES Key Group

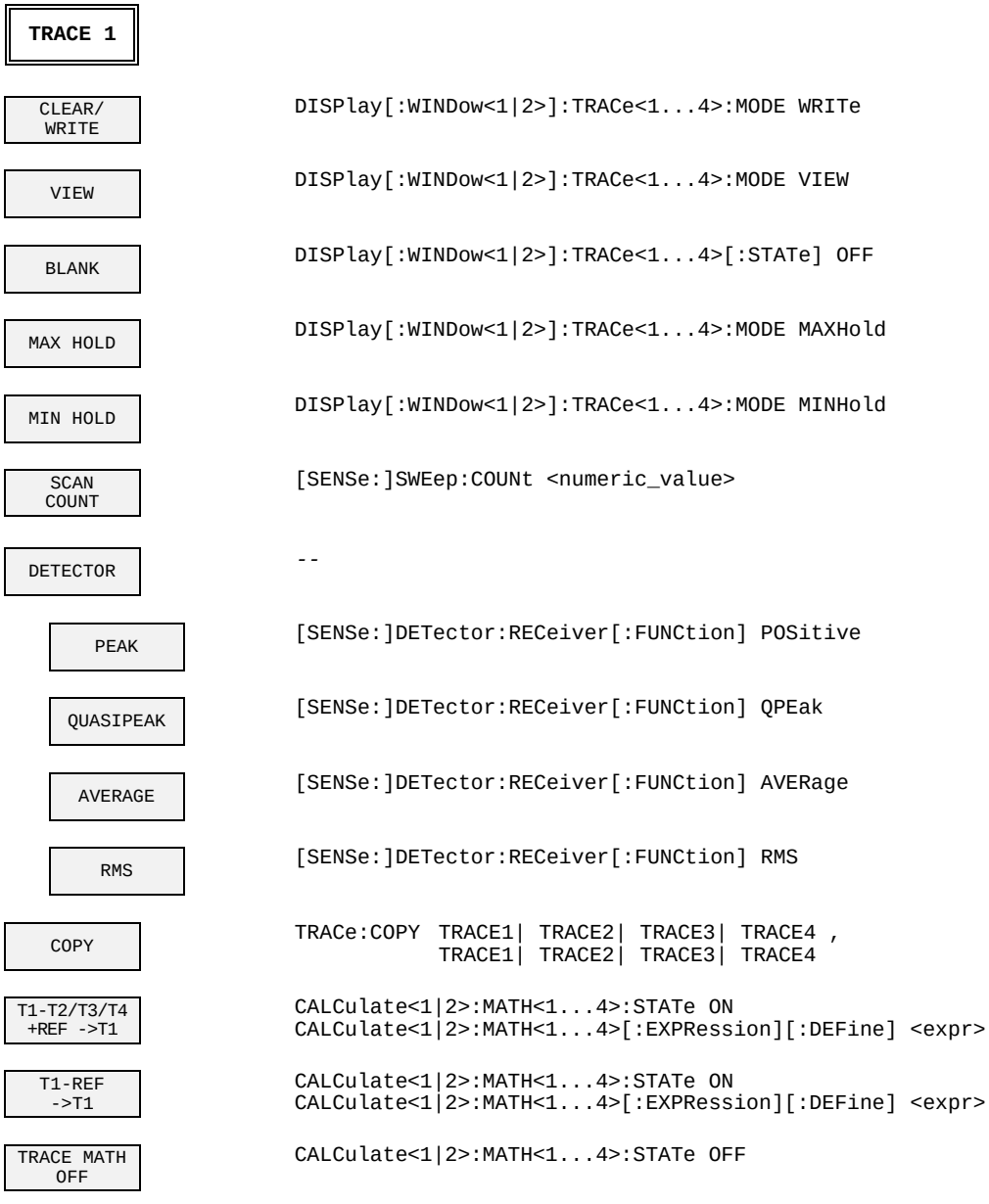
D LINES

DISPLAY LINE 1/2	CALCulate<1|2>:DLINe<1|2>:STATe ON | OFF; CALCulate<1|2>:DLINe<1|2> <numeric_value>
THRESHOLD LINE	CALCulate<1|2>:THReshold ON | OFF; CALCulate<1|2>:THReshold <numeric_value>
REFERENCE LINE	CALCulate<1|2>:RLINe:STATe ON | OFF; CALCulate<1|2>:RLINe <numeric_value>
FREQUENCY LINE 1/2	CALCulate<1|2>:FLINe<1|2>:STATe ON | OFF; CALCulate<1|2>:FLINe<1|2> <numeric_value>

LIMITS

SELECT LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:NAME <string>; CALCulate<1|2>:LIMit<1...8>:STATe ON | OFF
NEW LIMIT LINE	see EDIT LIMIT LINE
NAME	CALCulate<1|2>:LIMit<1...8>:NAME <string>
VALUES	no corresponding IEC/IEEE-bus command
INSERT VALUE	no corresponding IEC/IEEE-bus command
DELETE VALUE	no corresponding IEC/IEEE-bus command
SHIFT X LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:CONTrol:SHIFt <numeric_value>
SHIFT Y LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:UPPer:SHIFt <numeric_value> CALCulate<1|2>:LIMit<1...8>:LOWer:SHIFt <numeric_value>
SAVE LIMIT LINE	automatically executed during IEC/IEEE-bus operation
EDIT LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:UNIT DBM | DBPW | DBPT | DBUV| DBUA | DBUV_M | DBUA_M | HZ CALCulate<1|2>:LIMit<1...8>:TRACe <numeric_value> CALCulate<1|2>:LIMit<1...8>:COMMent 'string' CALCulate<1|2>:LIMit<1...8>:CONTrol[:DATA] <num_value>, <num_value>.. CALCulate<1|2>:LIMit<1...8>:CONTrol:OFFset <numeric_value> CALCulate<1|2>:LIMit<1...8>:CONTrol:SPACing LINear | LOGarithmic CALCulate<1|2>:LIMit<1...8>:UPPer[:DATA] <num_value>, <num_value>.. CALCulate<1|2>:LIMit<1...8>:UPPer:STATe ON | OFF CALCulate<1|2>:LIMit<1...8>:UPPer:OFFset <numeric_value> CALCulate<1|2>:LIMit<1...8>:UPPer:SPACing LINear | LOGarithmic CALCulate<1|2>:LIMit<1...8>:LOWer[:DATA] <num_value>,<num_value>.. CALCulate<1|2>:LIMit<1...8>:LOWer:STATe ON | OFF CALCulate<1|2>:LIMit<1...8>:LOWer:OFFset <numeric_value> CALCulate<1|2>:LIMit<1...8>:LOWer:SPACing LINear | LOGarithmic
COPY LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:COPY 1...8 | <name>
DELETE LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:DELete

3.9.1.7 TRACE Key Group



3.9.1.8 SWEEP Key Group

COUPLING RUN	INITiate[:IMMediate]
TRIGGER	
FREE RUN	TRIGger[:SEQuence]:SOURce IMMediate
EXTERN	TRIGger[:SEQuence]:SOURce EXTernal TRIGger[:SEQuence]:LEVel[:EXTernal] -5.0...+5.0V
SLOPE POS/NEG	TRIGger[:SEQuence]:SLOPe POSitive|NEGative
SWEEP/ SCAN	
SCAN TABLE	[SENSe:]FREQuency:STARt <numeric_value> [SENSe:]FREQuency:STOP <numeric_value> [SENSe:]SWEep:SPACing LINear | LOGarithmic | AUTO DISPlay[:WINDow]:TRACe:Y[:SCALe]:TOP <numeric_value> DISPlay[:WINDow]:TRACe:Y[:SCALe]:BOTTom <numeric_value> DISPlay[:WINDow<1|2>]:TRACe:X:SPACing LINear | LOGarithmic
ADJUST AXIS	--
SINGLE SCAN	INITiate2:CONTinuous OFF; INITiate[:IMMediate]
CONTINUOUS SCAN	INITiate2:CONTinuous ON; INITiate[:IMMediate]
SCAN RANGES	[SENSe:]SCAN<1...10>:RANGes[:COUNt] 1 ... 10 [SENSe:]SCAN<1...10>:STARt <numeric_value> [SENSe:]SCAN<1...10>:STOP <numeric_value> [SENSe:]SCAN<1...10>:STEP <numeric_value> [SENSe:]SCAN<1...10>:BANDwidth:RESolution <numeric_value> [SENSe:]SCAN<1...10>:TIME <numeric_value> [SENSe:]SCAN<1...10>:INPUT:ATTenuation:AUTO <numeric_value> [SENSe:]SCAN<1...10>:INPut:ATTenuation <numeric_value> [SENSe:]SCAN<1...10>:INPUT:GAIN:STATe ON | OFF [SENSe:]SCAN<1...10>:INPUT:GAIN:AUTO ON | OFF [SENSe:]SCAN<1...10>:INPut:TYPE INPUT1 | INPUT2
INS BEFORE RANGE	--
INS AFTER RANGE	--
DELETE RANGE	--
RANGE 1-5 6-10	--
RUN SCAN	INITiate2[:IMMediate]
HOLD SCAN	HOLD
STOP SCAN	ABORT

3.9.2 Basic Instrument - Signal Analysis Mode

3.9.2.1 FREQUENCY Key Group

START

START MANUAL	[SENSe:]FREQuency:STARt <numeric_value>
CENTER FIXED	[SENSe:]FREQuency:STARt:LINK CENTer
SPAN FIXED	[SENSe:]FREQuency:STARt:LINK SPAN
STOP FIXED	[SENSe:]FREQuency:STARt:LINK STOP
FREQ AXIS LIN LOG	[SENSe:]SWEep:SPACing LIN | LOG

STOP

STOP MANUAL	[SENSe:]FREQuency:STOP <numeric_value>
START FIXED	[SENSe:]FREQuency:STOP:LINK STARt
CENTER FIXED	[SENSe:]FREQuency:STOP:LINK CENTer
SPAN FIXED	[SENSe:]FREQuency:STOP:LINK SPAN
FREQ AXIS LIN LOG	[SENSe:]SWEep:SPACing LIN | LOG

CENTER

CENTER MANUAL	[SENSe:]FREQuency:CENTer <numeric_value>
START FIXED	[SENSe:]FREQuency:CENTer:LINK STARt
SPAN FIXED	[SENSe:]FREQuency:CENTer:LINK SPAN
STOP FIXED	[SENSe:]FREQuency:CENTer:LINK STOP
FREQUENCY OFFSET	[SENSe:]FREQuency:OFFSet <numeric_value>
FREQ AXIS LIN LOG	[SENSe:]SWEep:SPACing LIN | LOG

STEP

AUTO 0.1 * SPAN	[SENSe:]FREQuency:CENTer:STEP:LINK SPAN; [SENSe:]FREQuency:CENTer:STEP:LINK:FACTor 10PCT
or	
AUTO 0.1 * RBW	[SENSe:]FREQuency:CENTer:STEP:LINK RBW; [SENSe:]FREQuency:CENTer:STEP:LINK:FACTor 10PCT
AUTO 0.5 * SPAN	[SENSe:]FREQuency:CENTer:STEP:LINK SPAN; [SENSe:]FREQuency:CENTer:STEP:LINK:FACTor 50PCT
or	
AUTO 0.5 * RBW	[SENSe:]FREQuency:CENTer:STEP:LINK RBW; [SENSe:]FREQuency:CENTer:STEP:LINK:FACTor 50PCT
AUTO X * SPAN	[SENSe:]FREQuency:CENTer:STEP:LINK SPAN; [SENSe:]FREQuency:CENTer:STEP:LINK:FACTor <numeric_value>
or	
AUTO X * RBW	[SENSe:]FREQuency:CENTer:STEP:LINK RBW; [SENSe:]FREQuency:CENTer:STEP:LINK:FACTor <numeric_value>
STEPSIZE MANUAL	[SENSe:]FREQuency:CENTer:STEP <numeric_value>
STEPSIZE = CENTER	no corresponding IEC/IEEE-bus command

SPAN

SPAN MANUAL	[SENSe:]FREQuency:SPAN <numeric_value>
START FIXED	[SENSe:]FREQuency:SPAN:LINK START
CENTER FIXED	[SENSe:]FREQuency:SPAN:LINK CENTer
STOP FIXED	[SENSe:]FREQuency:SPAN:LINK STOP
ZERO SPAN	[SENSe:]FREQuency:SPAN 0HZ
FULL SPAN	[SENSe:]FREQuency:SPAN:FULL
LAST SPAN	no corresponding IEC/IEEE-bus command
ZOOM	DISPlay[:WINDow<1|2>]:TRACe<1...4>:X[:SCALe]:ZOOM ON| OFF
MOVE ZOOM WINDOW	DISPlay[:WINDow<1|2>]:TRACe<1...4>:X[:SCALe]:ZOOM[:FREQuency]:CENTer <numeric_value>
MOVE ZOOM START	DISPlay[:WINDow<1|2>]:TRACe<1...4>:X[:SCALe]:ZOOM[:FREQuency]:STARt <numeric_value>
MOVE ZOOM STOP	DISPlay[:WINDow<1|2>]:TRACe<1...4>:X[:SCALe]:ZOOM[:FREQuency]:STOP <numeric_value>
ZOOM OFF	DISPlay[:WINDow<1|2>]:TRACe<1...4>:X[:SCALe]:ZOOM OFF
FREQ AXIS LIN LOG	[SENSe:]SWEep:SPACing LIN | LOG

3.9.2.2 LEVEL Key Group

REF	
REF LEVEL	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RLEVel <numeric_value>
REF LEVEL OFFSET	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RLEVel:OFFSet <numeric_value>
GRID ABS/REL	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:MODE ABSolute|RELative
UNIT	--
dBm	CALCulate<1|2>:UNIT:POWer DBM
dBmV	CALCulate<1|2>:UNIT:POWer DBMV
dBµV	CALCulate<1|2>:UNIT:POWer DBUV
dBµA	CALCulate<1|2>:UNIT:POWer DBUA
dBpW	CALCulate<1|2>:UNIT:POWer DBPW
dB*/MHz	CALCulate<1|2>:UNIT:POWer DBUV_MHZ CALCulate<1|2>:UNIT:POWer DBUA_MHZ CALCulate<1|2>:UNIT:POWer DBMV_MHZ
VOLT	CALCulate<1|2>:UNIT:POWer VOLT
AMPERE	CALCulate<1|2>:UNIT:POWer AMPere
WATT	CALCulate<1|2>:UNIT:POWer WATT
PROBE CODE ON / OFF	UNIT:PROBe ON|OFF
RF ATTEN MANUAL	INPut:ATTenuation <numeric_value>
ATTEN AUTO NORMAL	INPut:ATTenuation:AUTO:MODE NORMal; INPut:ATTenuation:AUTO ON
ATTEN AUTO LOW NOISE	INPut:ATTenuation:AUTO:MODE LNOise; INPut:ATTenuation:AUTO ON
ATTEN AUTO LOW DIST	INPut:ATTenuation:AUTO:MODE LDIStortion; INPut:ATTenuation:AUTO ON
MIXER LEVEL	INPut:MIXer <numeric value>
MAX LEVEL AUTO	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RVALue:AUTO ON
MAX LEVEL MANUAL	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RVALue:AUTO OFF; DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RVALue <numeric_value>

RANGE	
LINEAR/%	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y:SPACing PERCent
LINEAR/dB	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y:SPACing LINear
LOG MANUAL	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y:SPACing LOGarithmic; DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe] <numeric_value>

3.9.2.3 INPUT Key Group

INPUT	
RF ATTEN MANUAL	INPut:ATTenuation <numeric_value>
ATTEN AUTO NORMAL	INPut:ATTenuation:AUTO:MODE NORMal; INPut:ATTenuation:AUTO ON
ATTEN AUTO LOW NOISE	INPut:ATTenuation:AUTO:MODE LNOise; INPut:ATTenuation:AUTO ON
ATTEN AUTO LOW DIST	INPut:ATTenuation:AUTO:MODE LDIStortion; INPut:ATTenuation:AUTO ON
MIXER LEVEL	INPut:MIXer <numeric value>
INPUT SELECT	--
RF INPUT 50 OHM	INPut:IMPedance 50
RF INPUT 75 OHM/RAM	INPut:IMPedance:CORRection RAM
RF INPUT 75OHM/RAZ	INPut:IMPedance:CORRection RAZ

3.9.2.4 MARKER Key Group

NORMAL	
MARKER 1..4	CALCulate<1|2>:MARKer<1...4>[:STATe] ON | OFF; CALCulate<1|2>:MARKer<1...4>:X <numeric value>; CALCulate<1|2>:MARKer<1...4>:Y?
SIGNAL COUNT	CALCulate<1|2>:MARKer<1...4>:COUNt ON | OFF; CALCulate<1|2>:MARKer<1...4>:COUNt:FREQuency?
MARKER DEMOD	--
MKR DEMOD ON/OFF	CALCulate<1|2>:MARKer<1...4>:FUNCtion:DEModulation[:STATe] ON | OFF

AM	CALCulate<1|2>:MARKer<1...4>:FUNCtion:DEModulation:SELect AM
FM	CALCulate<1|2>:MARKer<1...4>:FUNCtion:DEModulation:SELect FM
MKR STOP TIME	CALCulate<1|2>:MARKer<1..4>:FUNCtion:DEModulation:HOLDoff <num_value>
VOLUME	SYSTem:SPEaker:VOLume <numeric_value>
MARKER ZOOM	CALCulate<1|2>:MARKer<1...4>:FUNCtion:ZOOM <numeric_value>
MARKER INFO	DISPlay:WINDow<1|2>:MINFo ON | OFF (Bildschirmanzeige)
ALL MARKER OFF	CALCulate<1|2>:MARKer<1...4>:AOFF
POWER MEAS SETTINGS	--
SET NO OF ADJ CHAN'S	[SENSe:]POWer:ACHannel:ACPairs
ACP STANDARD	CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:PRESet NADC| TETRA| PDC| PHS| CDPD| CDMA| NONE
CH FILTER ON/OFF	CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:CFILter ON | OFF
CHANNEL BANDWIDTH	[SENSe:]POWer:ACHannel:BANDwidth|BWIDth[:CHANnel] <numeric_value> [SENSe:]POWer:ACHannel:BANDwidth|BWIDth:ACHannel <numeric_value> [SENSe:]POWer:ACHannel:BANDwidth|BWIDth:ALTernate<1|2> <numeric_value>
CHANNEL SPACING	[SENSe:]POWer:ACHannel:SPACing[:UPPer] <numeric_value> [SENSe:]POWer:ACHannel:SPACing:ACHannel <numeric_value> [SENSe:]POWer:ACHannel:SPACing:ALTernate<1|2> <numeric_value>
EDIT ACP LIMITS	CALCulate<1|2>:LIMit<1...8>:ACPower:ACHannel <num_value>,<num_value> CALCulate<1|2>:LIMit<1...8>:ACPower:ACHannel:STATe ON | OFF CALCulate<1|2>:LIMit<1...8>:ACPower:ALTernate<1|2> <numeric_value>, <numeric_value> CALCulate<1|2>:LIMit<1...8>:ACPower:ALTernate<1|2>:STATe ON | OFF
LIMIT CHECK	CALCulate:LIMit:ACPower[:STATe] ON | OFF CALCulate<1|2>:LIMit<1...8>:ACPower:ACHannel:RESult? CALCulate<1|2>:LIMit<1...8>:ACPower:ALTernate<1|2>:RESult?
% POWER BANDWIDTH	[SENSe:]POWer: BANDwidth|BWIDth <numeric_value>
CHANNEL POWER	CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:SELect CPOWer; CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:RESult? CPOWer; CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer[:STATe] OFF
CP/ACP ABS/REL	[SENSe:]POWer:ACHannel:MODE ABSolute|RELative
SET CP REFERENCE	[SENSe:]POWer:ACHannel:REFerence:AUTO ONCE
C/N	CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:SELect CN; CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:RESult? CN; CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer[:STATe] OFF
C/No	CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:SELect CN0; CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:RESult? CN0; CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer[:STATe] OFF

ADJACENT CHAN POWER	CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:SELect ACPower; CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:RESult? ACPower; CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer[:STATe] OFF
ADJUST CP SETTINGS	[SENSe:]POWer:ACHannel:PRESet ACPower|CPOWer|OBANdwidth|OBWidth|CN|CN0
OCCUPIED PWR BANDW	CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:SELect OBANdwidth | OBWidth CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer:RESult? OBANdwidth| OBWidth CALCulate<1|2>:MARKer<1...4>:FUNCtion:POWer[:STATe] OFF
COUNTER RESOL	CALCulate<1|2>:MARKer<1...4>:COUNt:RESolution <numeric value>
SIGNAL TRACK	CALCulate<1|2>:MARKer<1...4>:FUNCtion:STRack[:STATe] ON | OFF
NOISE	CALCulate<1|2>:MARKer<1...4>:FUNCtion:NOISe[:STATe] ON | OFF; CALCulate<1|2>:MARKer<1...4>:FUNCtion:NOISe:RESult?
STEP	
STEPSIZE AUTO	CALCulate<1|2>:MARKer<1...4>:STEP:AUTO ON | OFF
STEPSIZE MANUAL	CALCulate<1|2>:MARKer<1...4>:STEP[:INCRement] <numeric_value>
MKR TO STEPSIZE	CALCulate<1|2>:MARKer<1...4>:FUNCtion:MSTep
DELTA TO STEPSIZE	--
DELTA	
DELTA 1...4	CALCulate<1|2>:DELTamarker<1...4>[:STATe] ON | OFF CALCulate<1|2>:DELTamarker<1...4>:X <numeric value> CALCulate<1|2>:DELTamarker<1...4>:X:RELative? CALCulate<1|2>:DELTamarker<1...4>:Y?
PHASE NOISE	CALCulate<1|2>:DELTamarker<1...4>:FUNCtion:PNOise[:STATe] ON | OFF CALCulate<1|2>:DELTamarker<1...4>:FUNCtion:PNOise:RESult?
REFERENCE POINT	--
REF POINT LEVEL	CALCulate<1|2>:DELTamarker<1..4>:FUNCtion:FIXed:RPOint:Y <numeric_value>
REF POINT LVL OFFSET	CALCulate<1|2>:DELTamarker<1..4>:FUNCtion:FIXed:RPOint:Y:OFFSet <numeric_value>
REF POINT FREQUENCY	CALCulate<1|2>:DELTamarker<1..4>:FUNCtion:FIXed:RPOint:X <numeric_value>
REF POINT TIME	CALCulate<1|2>:DELTamarker<1..4>:FUNCtion:FIXed:RPOint:X <numeric_value>
REFERENCE FIXED	CALCulate<1|2>:DELTamarker<1...4>:FUNCtion:FIXed[:STATe] ON | OFF
DELTA MKR ABS REL	CALCulate<1|2>:DELTamarker<1...4>:MODE ABSolute | RELative
ALL DELTA OFF	CALCulate<1|2>:DELTamarker<1...4>:AOFF

STEP	
STEPSIZE AUTO	CALCulate<1|2>:DELTamarker<1...4>:STEP:AUTO ON | OFF
MANUAL STEPSIZE	CALCulate<1|2>:DELTamarker<1...4>:STEP[:INCRement] <numeric_value>
DELTA TO STEPSIZE	--
SEARCH	
PEAK	CALCulate<1|2>:MARKer<1...4>:MAXimum[:PEAK] CALCulate<1|2>:DELTamarker<1...4>:MAXimum[:PEAK]
NEXT PEAK	CALCulate<1|2>:MARKer<1...4>:MAXimum:NEXT CALCulate<1|2>:DELTamarker<1...4>:MAXimum:NEXT
NEXT PEAK RIGHT	CALCulate<1|2>:MARKer<1...4>:MAXimum:RIGHt CALCulate<1|2>:DELTamarker<1...4>:MAXimum:RIGHt
NEXT PEAK LEFT	CALCulate<1|2>:MARKer<1...4>:MAXimum:LEFT CALCulate<1|2>:DELTamarker<1...4>:MAXimum:LEFT
SUM MKR ON/OFF	CALCulate<1|2>:MARKer<1...4>:FUNCtion:SUMMary[:STATe] ON | OFF
SUMMARY MARKER	
RMS	CALCulate<1|2>:MARKer<1...4>:FUNCtion:SUMMary:RMS[:STATe] ON | OFF CALCulate<1|2>:MARKer<1...4>:FUNCtion:SUMMary:RMS:RESult?
MEAN	CALCulate<1|2>:MARKer<1...4>:FUNCtion:SUMMary:MEAN[:STATe] ON | OFF CALCulate<1|2>:MARKer<1...4>:FUNCtion:SUMMary:MEAN:RESult?
PEAK HOLD ON/OFF	CALCulate<1|2>:MARKer<1...4>:FUNCtion:SUMMary:PHOLd ON | OFF
AVERAGE ON/OFF	CALCulate<1|2>:MARKer<1...4>:FUNCtion:SUMMary:AVERage ON | OFF
SWEEP COUNT	[SENSe:]SWEep:COUNt <numeric_value>
ALL SUM MKR OFF	CALCulate<1|2>:MARKer<1...4>:FUNCtion:SUMMary:AOFF
SEARCH LIM ON/OFF	CALCulate<1|2>:MARKer<1...4>:X:SLIMits[:STATe] ON | OFF
SELECT MARKER	no corresponding IEC/IEEE-bus command
ACTIVE MKR/DELTA	no corresponding IEC/IEEE-bus command
MIN	CALCulate<1|2>:MARKer<1...4>:MINimum[:PEAK] CALCulate<1|2>:DELTamarker<1...4>:MINimum[:PEAK]
NEXT MIN	CALCulate<1|2>:MARKer<1...4>:MINimum:NEXT CALCulate<1|2>:DELTamarker<1...4>:MINimum:NEXT

NEXT MIN LEFT	CALCulate<1|2>:MARKer<1...4>:MINimum:LEFT CALCulate<1|2>:DELTamarker<1...4>:MINimum:LEFT
NEXT MIN RIGHT	CALCulate<1|2>:MARKer<1...4>:MINimum:RIGHt CALCulate<1|2>:DELTamarker<1...4>:MINimum:RIGHt
EXCLUDE LO ON/OFF	CALCulate<1|2>:MARKer<1...4>:LOEXclude ON | OFF
PEAK EXCURSION	CALCulate<1|2>:MARKer<1...4>:PEXCursion <numeric_value>
N dB DOWN	CALCulate<1|2>:MARKer<1...4>:FUNCtion:NDBDown <numeric_value> CALCulate<1|2>:MARKer<1...4>:FUNCtion:NDBDown:STATe ON | OFF CALCulate<1|2>:MARKer<1...4>:FUNCtion:NDBDown:RESult? CALCulate<1|2>:MARKer<1...4>:FUNCtion:NDBDown:FREQuency?
SHAPE FACT 60/3 dB	CALCulate<1|2>:MARKer<1...4>:FUNCtion:SFACtor (60dB/3dB) CALCulate<1|2>:MARKer<1...4>:FUNCtion:SFACtor:STATe ON | OFF CALCulate<1|2>:MARKer<1...4>:FUNCtion:SFACtor:RESult? CALCulate<1|2>:MARKer<1...4>:FUNCtion:SFACtor:FREQuency?
SHAPE FACT 60/6 dB	CALCulate<1|2>:MARKer<1...4>:FUNCtion:SFACtor (60dB/6dB) CALCulate<1|2>:MARKer<1...4>:FUNCtion:SFACtor:STATe ON | OFF CALCulate<1|2>:MARKer<1...4>:FUNCtion:SFACtor:RESult? CALCulate<1|2>:MARKer<1...4>:FUNCtion:SFACtor:FREQuency?
MKR->	
PEAK	CALCulate<1|2>:MARKer<1...4>:MAXimum[:PEAK] CALCulate<1|2>:DELTamarker<1...4>:MAXimum[:PEAK]
MKR-> CENTER	CALCulate<1|2>:MARKer<1...4>:FUNCtion:CENTer
MKR-> REF LEVEL	CALCulate<1|2>:MARKer<1...4>:FUNCtion:REFerence
MKR-> CF STEPSIZE	CALCulate<1|2>:MARKer<1...4>:FUNCtion:CSTep
MKR-> START	CALCulate<1|2>:MARKer<1...4>:FUNCtion:STARt
MKR-> STOP	CALCulate<1|2>:MARKer<1...4>:FUNCtion:STOP
MKR-> TRACE	CALCulate<1|2>:MARKer<1...4>:TRACe <numeric value> CALCulate<1|2>:DELTamarker<1...4>:TRACe <numeric value>

3.9.2.5 LINES Key Group

D LINES

DISPLAY LINE 1/2	`CALCulate:DLINe<1|2>:STATe ON | OFF;` `CALCulate:DLINe<1|2> <numeric_value>`
THRESHOLD LINE	`CALCulate:THReshold ON | OFF;` `CALCulate:THReshold <numeric_value>`
REFERENCE LINE	`CALCulate:RLINe:STATe ON | OFF;` `CALCulate:RLINe <numeric_value>`
FREQUENCY LINE 1/2	`CALCulate:FLINe<1|2>:STATe ON | OFF;` `CALCulate:FLINe<1|2> <numeric_value>`
or	
TIME LINE 1/2	`CALCulate:TLINe<1|2>:STATe ON | OFF;` `CALCulate:TLINe<1|2> <numeric_value>`

LIMITS

SELECT LIMIT LINE	`CALCulate<1|2>:LIMit<1...8>:NAME <string>;` `CALCulate<1|2>:LIMit<1...8>:STATe ON | OFF`
NEW LIMIT LINE	see EDIT LIMIT LINE
NAME	`CALCulate<1|2>:LIMit<1...8>:NAME <string>`
VALUES	no corresponding IEC/IEEE-bus command
INSERT VALUE	no corresponding IEC/IEEE-bus command
DELETE VALUE	no corresponding IEC/IEEE-bus command
SHIFT X LIMIT LINE	`CALCulate<1|2>:LIMit<1...8>:CONTrol:SHIFt <numeric_value>`
SHIFT Y LIMIT LINE	`CALCulate<1|2>:LIMit<1...8>:UPPer:SHIFt <numeric_value>` `CALCulate<1|2>:LIMit<1...8>:LOWer:SHIFt <numeric_value>`
SAVE LIMIT LINE	automatically executed during IEC/IEEE-bus operation

EDIT LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:UNIT DBM| DBPW| WATT| DBUV| VOLT|DBUA| AMPere| DB| DBUV_MHZ| DBUA_MHZ| DEG| RAD| S| HZ| PCT| UNITLESS CALCulate<1|2>:LIMit<1...8>:COMMent 'string' CALCulate<1|2>:LIMit<1...8>:TRACe <numeric_value> CALCulate<1|2>:LIMit<1...8>:CONTrol[:DATA] <num_value>, <num_value>.. CALCulate<1|2>:LIMit<1...8>:CONTrol:DOMain FREQuency|TIME CALCulate<1|2>:LIMit<1...8>:CONTrol:OFFset <numeric_value> CALCulate<1|2>:LIMit<1...8>:CONTrol:MODE RELative | ABSolute CALCulate<1|2>:LIMit<1...8>:CONTrol:UNIT[:TIME] S | SYM CALCulate<1|2>:LIMit<1...8>:CONTrol:SPACing LINear | LOGarithmic CALCulate<1|2>:LIMit<1...8>:UPPer[:DATA] <numeric_value>, <numeric_value>.. CALCulate<1|2>:LIMit<1...8>:UPPer:STATe ON | OFF CALCulate<1|2>:LIMit<1...8>:UPPer:OFFset <numeric_value> CALCulate<1|2>:LIMit<1...8>:UPPer:MARGin <numeric_value> CALCulate<1|2>:LIMit<1...8>:UPPer:MODE RELative | ABSolute CALCulate<1|2>:LIMit<1...8>:UPPer:SPACing LINear | LOGarithmic CALCulate<1|2>:LIMit<1...8>:LOWer[:DATA] <num_value>,<num_value>.. CALCulate<1|2>:LIMit<1...8>:LOWer:STATe ON | OFF CALCulate<1|2>:LIMit<1...8>:LOWer:OFFset <numeric_value> CALCulate<1|2>:LIMit<1...8>:LOWer:MARGin <numeric_value> CALCulate<1|2>:LIMit<1...8>:LOWer:MODE RELative | ABSolute CALCulate<1|2>:LIMit<1...8>:LOWer:SPACing LINear | LOGarithmic CALCulate<1|2>:LIMit<1...8>:FAIL? CALCulate<1|2>:LIMit<1...8>:CLEar[:IMMediate]
COPY LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:COPY 1...8 | <name>
DELETE LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:DELete
X OFFSET	CALCulate<1|2>:LIMit<1...8>:CONTrol:OFFset <numeric_value>
Y OFFSET	CALCulate<1|2>:LIMit<1...8>:UPPer:OFFset <numeric_value> CALCulate<1|2>:LIMit<1...8>:LOWer:OFFset <numeric_value>

3.9.2.6 TRACE Key Group

TRACE 1

CLEAR/ WRITE	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE WRITe
VIEW	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE VIEW
BLANK	DISPlay[:WINDow<1|2>]:TRACe<1...4>[:STATe] OFF
AVERAGE	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE AVERage

MAX HOLD	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE MAXHold
MIN HOLD	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE MINHold
HOLD CONT ON/OFF	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE:HCONtinuous ON|OFF
SWEEP COUNT	[SENSe:]SWEep:COUNt <numeric_value>
DETECTOR	--
AUTO SELECT	[SENSe:]DETector[:FUNCtion]:AUTO ON | OFF
DETECTOR AUTOPEAK	[SENSe:]DETector[:FUNCtion] APEak
DETECTOR MAX PEAK	[SENSe:]DETector[:FUNCtion] POSitive
DETECTOR MIN PEAK	[SENSe:]DETector[:FUNCtion] NEGative
DETECTOR SAMPLE	[SENSe:]DETector[:FUNCtion] SAMPle
DETECTOR RMS	[SENSe:]DETector[:FUNCtion] RMS
DETECTOR AVERAGE	[SENSe:]DETector[:FUNCtion] AVERage
COPY..	TRACe:COPY TRACE1| TRACE2| TRACE3| TRACE4 , TRACE1| TRACE2| TRACE3| TRACE4
ANALOG TR ON/OFF	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE:ANALog ON|OFF
TRACE MATH	--
T1-T2/T3/T4 +REF ->T1	CALCulate<1|2>:MATH<1...4>[:EXPRession][:DEFine] <expr>
T1-REF ->T1	CALCulate<1|2>:MATH<1...4>[:EXPRession][:DEFine] <expr>
ADJUST TO TRACE	no corresponding IEC/IEEE-bus command
TRACE MATH OFF	CALCulate<1|2>:MATH<1...4>:STATe ON | OFF

3.9.2.7 SWEEP Key Group

COUPLING

RES BW MANUAL	[SENSe:]BANDwidth|BWIDth[:RESolution] <numeric_value>
RES BW AUTO	[SENSe:]BANDwidth|BWIDth[:RESolution]:AUTO ON | OFF
VIDEO BW MANUAL	[SENSe:]BANDwidth|BWIDth:VIDeo <numeric_value>
VIDEO BW AUTO	[SENSe:]BANDwidth|BWIDth:VIDeo:AUTO ON | OFF
SWEEP TIME MANUAL	[SENSe:]SWEep:TIME <numeric_value>
SWEEP TIME AUTO	[SENSe:]SWEep:TIME:AUTO ON | OFF
COUPLING DEFAULT	[SENSe:]BANDwidth|BWIDth[:RESolution]:AUTO ON; [SENSe:]BANDwidth|BWIDth:VIDeo:AUTO ON; [SENSe:]SWEep:TIME:AUTO ON
COUPLING RATIO	--
RBW / VBW SINE [1]	[SENSe:]BANDwidth|BWIDth:VIDeo:RATio SINe
RBW / VBW PULSE [.1]	[SENSe:]BANDwidth|BWIDth:VIDeo:RATio PULSe
RBW / VBW NOISE [10]	[SENSe:]BANDwidth|BWIDth:VIDeo:RATio NOISe
RBW / VBW MANUAL	[SENSe:]BANDwidth|BWIDth:VIDeo:RATio <numeric_value>
SPAN / RBW AUTO [50]	[SENSe:]BANDwidth|BWIDth[:RESolution]:RATio 0.02
SPAN / RBW MANUAL	[SENSe:]BANDwidth|BWIDth[:RESolution]:RATio <numeric_value>
RBW 1kHz ANA/DIG	[SENSe:]BANDwidth|BWIDth[:RESolution]:MODE ANALog | DIGital
RBW <=1kHz FFT/NORM	[SENSe:]BANDwidth|BWIDth[:RESolution]:MODE:FFT ON | OFF
MAIN PLL BANDWIDTH	[SENSe:]BANDwidth|BWIDth:PLL AUTO|HIGH|MEDium|LOW

TRIGGER

FREE RUN	TRIGger[:SEQuence]:SOURce IMMediate
VIDEO	TRIGger[:SEQuence]:SOURce VIDeo TRIGger[:SEQuence]:LEVel:VIDeo <numeric value>
LINE	TRIGger[:SEQuence]:SOURce LINE
EXTERN	TRIGger[:SEQuence]:SOURce EXTernal TRIGger[:SEQuence]:LEVel[:EXTernal] -5.0...+5.0V
RF POWER	TRIGger[:SEQuence]:SOURce RFPower
TRIGGER DELAY	TRIGger[:SEQuence]:HOLDoff <numeric_value>
SLOPE POS/NEG	TRIGger[:SEQuence]:SLOPe POSitive|NEGative

SWEEP

CONTINUOUS SWEEP	INITiate:CONTinuous ON; INITiate[:IMMediate]
SINGLE SWEEP	INITiate:CONTinuous OFF; INITiate[:IMMediate]
SWEEP TIME AUTO	[SENSe:]SWEep:TIME:AUTO ON | OFF
SWEEP TIME MANUAL	[SENSe:]SWEep:TIME <numeric_value>
SWEEP COUNT	[SENSe:]SWEep:COUNt <numeric_value>
GAP SWEEP ON/OFF	[SENSe:]SWEep:GAP ON | OFF
GAP SWEEP SETTINGS	--
TRIGGER LEVEL	TRIGger[:SEQuence]:LEVel:VIDeo <numeric value>
PRE TRIGGER	[SENSe:]SWEep:GAP:PRETrigger <numeric_value>
TRG TO GAP TIME	[SENSe:]SWEep:GAP:TRGTogap <numeric_value>
GAP LENGTH	[SENSe:]SWEep:GAP:LENGth <numeric_value>
GATE ON / OFF	[SENSe:]SWEep:EGATe ON | OFF
GATE SETTINGS	--

GATE LEVEL	[SENSe:]SWEep:EGATe:LEVel <numeric_value>
GATE MODE LEVEL/EDGE	[SENSe:]SWEep:EGATe:TYPE LEVel | EDGE
GATE POL POS/NEG	[SENSe:]SWEep:EGATe:POLarity POSitive | NEGative
GATE DELAY	[SENSe:]SWEep:EGATe:HOLDoff <numeric_value>
GATE LENGTH	[SENSe:]SWEep:EGATe:LENGth <numeric_value>
GATE EXTERN	[SENSe:]SWEep:EGATe:SOURce EXTernal
GATE RF POWER	[SENSe:]SWEep:EGATe:SOURce RFPower
GATE ADJUST	
GATE LEVEL	[SENSe:]SWEep:EGATe:LEVel <numeric_value>
GATE MODE LEVEL/EDGE	[SENSe:]SWEep:EGATe:TYPE LEVel | EDGE
GATE POL POS/NEG	[SENSe:]SWEep:EGATe:POLarity POSitive | NEGative
GATE DELAY	[SENSe:]SWEep:EGATe:HOLDoff <numeric_value>
GATE LENGTH	[SENSe:]SWEep:EGATe:LENGth <numeric_value>
SWEEP TIME MANUAL	[SENSe:]SWEep:TIME <numeric_value>
RES BW MANUAL	[SENSe:]BANDwidth|BWIDth[:RESolution] <numeric_value>
VIDEO MANUAL	[SENSe:]BANDwidth|BWIDth:VIDeo <numeric_value>
VIDEO AUTO	[SENSe:]BANDwidth|BWIDth:VIDeo:AUTO ON | OFF
SGL SWEEP DISP OFF	INITiate:DISPlay ON | OFF

3.9.3 Basic Instrument - General Device Settings

3.9.3.1 DATA VARIATION Key Group

HOLD	
UNLOCK	no corresponding IEC/IEEE-bus command
LOCK DATA	no corresponding IEC/IEEE-bus command
LOCK ALL	no corresponding IEC/IEEE-bus command
STEP	if needed, the step width is entered in the subsystem of the corresponding parameter.
STEPSIZE AUTO	--
STEPSIZE MANUAL	--

3.9.3.2 SYSTEM Key Group

DISPLAY	
FULL SCREEN	`DISPlay:FORmat SINGle`
SPLIT SCREEN	`DISPlay:FORmat SPLit`
ACTIVE SCREEN A	The screen is selected via the numeric suffix of the individual commands.
SCREEN COUPLING	--
MODE COUPLED	`INSTrument:COUPle MODE`
HORIZONTAL SCALING	`INSTrument:COUPle X`
VERTICAL SCALING	`INSTrument:COUPle Y`
COUPLING CONTROL	`INSTrument:COUPle CONTrol`
SCREENS UNCOUPLED	`INSTrument:COUPle NONE | ALL`

CONFIG DISPLAY	--
SELECT OBJECT	--
BRIGHTNESS	DISPlay:CMAP:HSL <hue>,<sat>,<lum>
TINT	DISPlay:CMAP<1...13>:HSL <hue>,<sat>,<lum>
SATURATION	DISPlay:CMAP<1...13>:HSL <hue>,<sat>,<lum>
DEFAULT COLORS	DISPlay:CMAP<1...13>:DEFault
PREDEFINED COLORS	DISPlay:CMAP<1...13>:PDEFined BLACk | BLUE | BROWn | GREen | CYAN | RED | MAGenta | YELLow | WHITe | DGRAy | LGRAy | LBLUe | LGREen | LCYan | LRED | LMAGenta
LOGO ON/OFF	DISPlay:LOGO ON|OFF
FREQUENCY ON/OFF	DISPlay:ANNotation:FREQuency ON|OFF
DATA ENTRY FIELD	--
DATAENTRY X	no corresponding IEC/IEEE-bus command
DATAENTRY Y	no corresponding IEC/IEEE-bus command
DEFAULT POSITION	no corresponding IEC/IEEE-bus command
DATAENTRY OPAQUE	no corresponding IEC/IEEE-bus command
TIME ON OFF	DISPlay[:WINDow<1|2>]:TIME ON | OFF
DISPLAY COMMENT	DISPlay[:WINDow<1|2>]:TEXT[:DATA] <string> DISPlay[:WINDow<1|2>]:TEXT:STATe ON | OFF

CAL

CAL SHORT	CALibration:SHORt?
CAL TOTAL	CALibration[:ALL]?
CAL RES BW	CALibration:BANDwidth|BWIDth[:RESolution]?
CAL LOG	CALibration:LDETector?
CAL LO SUPP	CALibration:LOSuppression?

CAL I/Q	CALibration:IQ?
CAL CORR ON/OFF	CALibration:STATe ON | OFF
CAL RESULTS	no corresponding IEC/IEEE-bus command
EMI PRESEL	CALibration:PRESelector
PRESEL PEAK	CALibration:PPEak?

INFO

FIRMWARE VERSION	*IDN?
HARDWARE+ OPTIONS	*OPT?
SELFTEST	*TST?
EXECUTE TEST	*TST?
SYSTEM MESSAGES	SYSTem:ERRor?
CLEAR MESSAGE	SYSTem:ERRor?
CLEAR ALL MESSAGES	--
UPDATE MESSAGES	--
OPTIONS	*OPT?

3.9.3.3 CONFIGURATION Key Group

MODE	The submenus are described under the associated operating mode.
EMI RECEIVER	`INSTrument[:SELect] RECeiver` `INSTrument:NSELect 6`
ANALYZER	`INSTrument[:SELect] SANalyzer` `INSTrument:NSELect 1`
TRACKING GENERATOR	`OUTPut[:STATe] ON | OFF`
VECTOR ANALYZER	`INSTrument[:SELect] ADEMod | DDEMod` `INSTrument:NSELect 2 | 3`
TV DEMOD	`[SENSe:]TV[:STATe] ON | OFF`
SETUP	
TRANSDUCER	`--`
TRANSDUCER FACTOR	`[SENSe:]CORRection:TRANsducer:SELect <name>` `[SENSe:]CORRection:TRANsducer[:STATe] ON | OFF`
TRANSDUCER SET	`[SENSe:]CORRection:TSET:SELect <name>` `[SENSe:]CORRection:TSET[:STATe] ON | OFF`
EDIT TRD FACTOR	`[SENSe:]CORRection:TRANsducer:SCALing LINear|LOGarithmic`
TRD FACTOR NAME	`[SENSe:]CORRection:TRANsducer:SELect <name>`
TRD FACTOR UNIT	`[SENSe:]CORRection:TRANsducer:UNIT <string>`
TRD FACTOR VALUES	`[SENSe:]CORRection:TRANsducer:DATA <freq>,<level>..`
INSERT LINE	no corresponding IEC/IEEE-bus command
DELETE LINE	no corresponding IEC/IEEE-bus command
SAVE TRD FACTOR	automatically executed during IEC/IEEE-bus operation
EDIT TRD SET	`[SENSe]CORRection:TSET:BREak ON|OFF`
TRANSD SET NAME	`[SENSe:]CORRection:TSET:SELect <name>`
TRANSD SET UNIT	`[SENSe:]CORRection:TSET:UNIT <string>`

TRANSD SET RANGES	[SENSe:]CORRection:TSET:RANGe<1...10> <freq>,<freql>,<name>..
INSERT LINE	no corresponding IEC/IEEE-bus command
DELETE LINE	no corresponding IEC/IEEE-bus command
SAVE TRD SET	automatically executed during IEC/IEEE-bus operation
NEW FACT/SET	s. EDIT TRD FACTOR bzw. EDIT TRD SET
DELETE FACTOR/SET	[SENSe:]CORRection:TRANsducer:DELete [SENSe:]CORRection:TSET:DELete
OPTIONS	no corresponding IEC/IEEE-bus command
REFERENCE INT/EXT	[SENSe:]ROSCillator:SOURce INTernal|EXTernal
EXT REF FREQUENCY	[SENSe:]ROSCillator:EXTernal:FREQuency <numeric_value>
SERVICE	--
INPUT RF	DIAGnostic:SERVice:INPut[:SELect] RF
INPUT CAL	DIAGnostic:SERVice:INPut[:SELect] CALibration
NOISE SOURCE	DIAGnostic:SERVice:NSOurce ON | OFF
REFERENCE ADJUST	--
REFERENCE	[SENSe:]ROSCillator:[INTernal:]TUNe <numeric_value>
REFERENCE PROG	[SENSe:]ROSCillator:[INTernal:]TUNe:SAVe
SERVICE FUNCTION	DIAGnostic:SERVice:FUNCtion <numeric_value>,<numeric_value>...
ENTER PASSWORD	SYSTem:PASSword[:CENable] <string>
CAL GEN 120 MHZ	--
PULSE 25 Hz	--
PULSE 100 kHz AB	--
PULSE 100 kHz CD	--

GENERAL SETUP	--
GPIB ADDRESS	SYSTem:COMMunicate:GPIB[:SELF]:ADDRess 0...30
USER PORT A/B	INPut:UPORt<1|2>[:VALue]? INPut:UPORt<1|2>:STATe ON | OFF OUTPut:UPORt<1|2>:STATe ON | OFF OUTPut:UPORt<1|2>[:VALue] <Binary>
TIME	SYSTem:TIME 0...23, 0...59, 0...59
DATE	SYSTem:DATE <num>,<num>,<num>
MONITOR CONNECTED	no corresponding IEC/IEEE-bus command
KEY CLICK ON/OFF	no corresponding IEC/IEEE-bus command

3.9.3.4 STATUS Key Group

LOCAL	Device message "Go to LOCAL (GTL)"

3.9.3.5 HARDCOPY Key Group

START	HCOPy[:IMMediate<1|2>]
SETTINGS	
COPY SCREEN	HCOPy:ITEM:ALL
COPY TRACE	HCOPy:ITEM:WINDow<1|2>:TRACe:STATe ON | OFF
COPY TABLE	HCOPy:ITEM:WINDow<1|2>:TABle:STATe ON | OFF
SELECT QUADRANT	--
UPPER LEFT	HCOPy:PAGE:DIMensions:QUADrant 1
LOWER LEFT	HCOPy:PAGE:DIMensions:QUADrant 2
UPPER RIGHT	HCOPy:PAGE:DIMensions:QUADrant 3
LOWER RIGHT	HCOPy:PAGE:DIMensions:QUADrant 4
FULL PAGE	HCOPy:PAGE:DIMensions:FULL
ENTER TEXT	--
COMMENT SCREEN A/B	HCOPy:ITEM:WINDow<1|2>:TEXT <string>
TITLE	HCOPy:ITEM:LABel:TEXT <string>
HARDCOPY DEVICE	HCOPy:DEVice:LANGuage WMF | EWMF | BMP | GDI
SETTINGS DEVICE 1/2	HCOPy:DESTination<1|2> <string> MMEMory:NAME <file_name> HCOPy:ITEM:FFEed<1|2>:STATe ON|OFF HCOPy:PAGE:ORIentation<1|2> LANDscape | PORTrait
ENABLE DEV1/DEV2	The numeric suffix after HCOPy:IMMediate<1|2> denotes the first or the second device.
COLOR ON/OFF	HCOPy:DEVice:COLor ON | OFF
TRC COLOR AUTO INC	HCOPy:ITEM:WINDow<1|2>:TRACe:CAINcrement ON | OFF

3.9.3.6 MEMORY Key Group

CONFIG

EDIT PATH	MMEMory:MSIS <device> MMEMory:CDIRectory <directory_name>
DELETE	MMEMory:DELete <file_name> MMEMory:RDIRectory <directory_name>
FORMAT DISK	MMEMory:INITialize <msus>
MAKE DIRECTORY	MMEMory:MDIRectory <directory_name>
RENAME	MMEMory:MOVE <file_source>,<file_destination>
SORT MODE	no corresponding IEC/IEEE-bus command
COPY	MMEMory:COPY <file_source>,<file_destination>

SAVE

EDIT NAME	MMEMory:STORe:STATe 1,<file_name>
EDIT PATH	The path is included in the file names
EDIT COMMENT	MMEMory:COMMent <string>
SELECT ITEMS TO SAVE	--
SELECT ITEMS	MMEMory:SELect[:ITEM]:GSETup ON|OFF MMEMory:SELect[:ITEM]:HWSettings ON|OFF MMEMory:SELect[:ITEM]:TRACe<1...4> ON|OFF MMEMory:SELect[:ITEM]:LINes[:ACTive] ON|OFF MMEMory:SELect[:ITEM]:LINes:ALL ON|OFF MMEMory:SELect[:ITEM]:CSETup ON|OFF MMEMory:SELect[:ITEM]:HCOPy ON|OFF MMEMory:SELect[:ITEM]:MACRos ON|OFF MMEMory:SELect[:ITEM]:SCData ON|OFF MMEMory:SELect[:ITEM]:TRANsducer[:ACTive] ON|OFF MMEMory:SELect[:ITEM]:TRANsducer:ALL ON|OFF MMEMory:SELect[:ITEM]:CVL[:ACTive] ON|OFF MMEMory:SELect[:ITEM]:CVL:ALL ON|OFF
ENABLE ALL ITEMS	MMEMory:SELect[:ITEM]:ALL
DISABLE ALL ITEMS	MMEMory:SELect[:ITEM]:NONE
DEFAULT CONFIG	MMEMory:SELect[:ITEM]:DEFault
DATA SET LIST	--

DATA SET CLEAR

```
MMEMory:CLEar:STATe 1,<file_name>
```

DATA SET CLEAR ALL

```
MMEMory:CLEar:ALL
```

RECALL

EDIT NAME

```
MMEMory:LOAD:STATe 1,<file_name>
```

EDIT PATH

The path is included in the file names

AUTO RECALL

```
MMEMory:LOAD:AUTO 1,<file_name>
```

SELECT ITEMS TO RECALL

```
--
```

SELECT ITEMS

```
MMEMory:SELect[:ITEM]:GSETup ON|OFF
MMEMory:SELect[:ITEM]:HWSettings ON|OFF
MMEMory:SELect[:ITEM]:TRACe<1...4> ON|OFF
MMEMory:SELect[:ITEM]:LINes[:ACTive] ON|OFF
MMEMory:SELect[:ITEM]:LINes:ALL ON|OFF
MMEMory:SELect[:ITEM]:CSETup ON|OFF
MMEMory:SELect[:ITEM]:HCOPy ON|OFF
MMEMory:SELect[:ITEM]:CDATa ON|OFF
MMEMory:SELect[:ITEM]:MACRos ON|OFF
MMEMory:SELect[:ITEM]:SCData ON|OFF
MMEMory:SELect[:ITEM]:TRANsducer[:ACTive] ON|OFF
MMEMory:SELect[:ITEM]:TRANsducer:ALL ON|OFF
MMEMory:SELect[:ITEM]:CVL[:ACTive] ON|OFF
MMEMory:SELect[:ITEM]:CVL:ALL ON|OFF
```

ENABLE ALL ITEMS

```
MMEMory:SELect[:ITEM]:ALL
```

DISABLE ALL ITEMS

```
MMEMory:SELect[:ITEM]:NONE
```

DEFAULT CONFIG

```
MMEMory:SELect[:ITEM]:DEFault
```

DATA SET LIST

```
--
```

DATA SET CLEAR

```
MMEMory:CLEar:STATe 1,<file_name>
```

DATA SET CLEAR ALL

```
MMEMory:CLEar:ALL
```

3.9.3.7 USER Key

MACRO 1...7	no corresponding IEC/IEEE-bus command
DEFINE MACRO	no corresponding IEC/IEEE-bus command
RECORD ON/OFF	no corresponding IEC/IEEE-bus command
DEFINE PAUSE	no corresponding IEC/IEEE-bus command
DELETE MACRO	no corresponding IEC/IEEE-bus command
MACRO TITLE	no corresponding IEC/IEEE-bus command
SELECT MACRO	no corresponding IEC/IEEE-bus command

3.9.4 Vector Signal Analysis Mode (Option FSE-B7)

3.9.4.1 CONFIGURATION Key Group - Digital Demodulation

MODE --

VECTOR ANALYZER --

DIGITAL STANDARD
```
[SENSe:]DDEMod:PRESet   GSM| FNADc| RNADc| TETRa| DCS1800| PCS1900|
       PHS| PDCup | PDCDown | APCO25CQPSK | APCO25C4FM|
       CDPD| DECT| CT2| ERMes| MODacom| PWT| TFTS| F16| F322| F324|
       F64| FQCDMA| RQCDMA
```

DIGITAL DEMOD
```
INSTrument[:SELect]  DDEMod
[SENSe:]DDEMod:FORMat   QPSK | PSK | MSK |QAM | FSK
[SENSe:]DDEMod:QPSK:FORMat NORMal | DIFFerential | OFFSet | DPI4
[SENSe:]DDEMod:PSK:NSTate   2 | 8
[SENSe:]DDEMod:PSK:FORMat   NORMal | DIFFerential
[SENSe:]DDEMod:MSK:FORMat   TYPE1 | TYPE2 | NORMal | DIFFerential
[SENSe:]DDEMod:QAM:NSTate   16
[SENSe:]DDEMod:FSK:NSTate   2 | 4

CALCulate<1|2>:MARKer<1...2>:FUNCtion:DDEMod:RESult? MERM| MEPK| MEPS|
       PERM| PEPK| PEPS| EVRM| EVPK| EVPS| IQOF| IQIM| ADR| FERR| DEV|
       FSRM| FSPK| FSPS| RHO| FEPK
```

MODULATION PARAMETERS --

SYMBOL RATE
```
[SENSe:]DDEMod:SRATe <numeric_value>
```

SIDE BAND NORM INV
```
SENSe:DDEMod:SBANd NORMal|INVerse
```

MEAS FILTER
```
[SENSe:]DDEMod:FILTer:MEASurement  OFF| RCOSine| RRCosine| GAUSsian
```

REFERENCE FILTER
```
[SENSe:]DDEMod:FILTer:REFerence  RCOSine | RRCosine | GAUSsian
```

ALPHA/BT
```
[SENSe:]DDEMod:FILTer:ALPHa <numeric_value>
```

FSK REF DEVIATION
```
CALCulate<1|2>:FSK:DEViation:REFerence <numeric_value>
```

NORMALIZE ON / OFF
```
[SENSe:]DDEMod:NORMalize ON | OFF
```

MEAS RESULT --

MAGNITUDE CAP BUFFER
```
CALCulate<1|2>:FEED  'TCAP'
```

MEAS SIGNAL
```
CALCulate<1|2>:FEED  'XTIM:DDEM:MEAS'
```

MAGNITUDE
```
CALCulate<1|2>:FORMat MAGNitude
```

PHASE
```
CALCulate<1|2>:FORMat PHASe
```

FREQUENCY
```
CALCulate<1|2>:FORMat FREQuency
```

REAL/IMAG PART	CALCulate<1|2>:FORMat RIMag
EYE DIAG [FREQ]	CALCulate<1|2>:FORMat FEYE
EYE DIAG [I]	CALCulate<1|2>:FORMat IEYE
EYE DIAG [Q]	CALCulate<1|2>:FORMat QEYE
EYE DIAG TRELLIS	CALCulate<1|2>:FORMat TEYE
POLAR [IQ] VECTOR	CALCulate<1|2>:FORMat COMP
POLAR [IQ] CONSTELL	CALCulate<1|2>:FORMat CONS
SYMBOL DISPLAY	DISPLay[:WINDow<1|2>]:TRACe<1...4>:SYMBol DOTS | BARS |OFF
PHASE WRAP ON/OFF	CALCulate<1|2>:FORMat PHASe | UPHase
EYE LENGTH	DISPlay[:WINDow<1|2>]:TRACe<1...4>:EYE:COUNt <numeric_value>
REFERENCE SIGNAL	CALCulate<1|2>:FEED ‘XTIM:DDEM:REF’
MAGNITUDE	CALCulate<1|2>:FORMat MAGNitude
PHASE	CALCulate<1|2>:FORMat PHASe
FREQUENCY	CALCulate<1|2>:FORMat FREQuency
REAL/IMAG PART	CALCulate<1|2>:FORMat RIMag
EYE DIAG [FREQ]	CALCulate<1|2>:FORMat FEYE
EYE DIAG [I]	CALCulate<1|2>:FORMat IEYE
EYE DIAG [Q]	CALCulate<1|2>:FORMat QEYE
EYE DIAG TRELLIS	CALCulate<1|2>:FORMat TEYE
POLAR [IQ] VECTOR	CALCulate<1|2>:FORMat COMP
POLAR [IQ] CONSTELL	CALCulate<1|2>:FORMat CONS
SYMBOL DISPLAY	DISPLay[:WINDow<1|2>]:TRACe<1...4>:SYMBol DOTS | BARS |OFF
PHASE WRAP ON/OFF	CALCulate<1|2>:FORMat PHASe | UPHase

EYE LENGTH	DISPlay[:WINDow<1|2>]:TRACe<1...4>:EYE:COUNt <numeric_value>
ERROR SIGNAL	CALCulate<1|2>:FEED ‘XTIM:DDEM:ERR:MPH’
MAGNITUDE	CALCulate<1|2>:FORMat MAGNitude
PHASE	CALCulate<1|2>:FORMat PHASe
FREQUENCY	CALCulate<1|2>:FORMat FREQuency
REAL/IMAG PART	CALCulate<1|2>:FORMat RIMag
ERROR VECT MAGNITUDE	CALCulate<1|2>:FORMat MAGNitude CALCulate<1|2>:FEED ‘XTIM:DDEM:ERR:VECT’
POLAR [IQ] VECTOR	CALCulate<1|2>:FORMat COMP
POLAR [IQ] CONSTELL	CALCulate<1|2>:FORMat CONS
SYMBOL DISPLAY	DISPLay[:WINDow<1|2>]:TRACe<1...4>:SYMBol DOTS | BARS | OFF
SYMB TABLE / ERRORS	CALCulate<1|2>:FEED ‘XTIM:DDEM:SYMB’
MEMORY SIZE	[SENSe:]TCAPture:LENGth 1024 | 2048 | 4096 | 8192 | 16384
FRAME LENGTH	[SENSe:]DDEMod:SEARch:TIME <numeric_value>
RESULT LENGTH	[SENSe:]DDEMod:TIME <numeric_value>
POINTS PER SYMBOL	[SENSe:]DDEMod:PRATe 1| 2| 4| 8| 16
TRIGGER	see section "SWEEP - TRIGGER"
RANGE	see section "LEVEL - RANGE"
IF BANDWIDTH	--
IF BW AUTO	[SENSe:]BANDwidth|BWIDth:RESolution:AUTO ON | OFF
IF BW MANUAL	[SENSe:]BANDwidth|BWIDth:RESolution <numeric_value>

3.9.4.2 CONFIGURATION Key Group - Analog Demodulation

MODE	--
VECTOR ANALYZER	--
ANALOG DEMOD	INSTrument[:SELect] ADEMod
MODULATION PARAMETER	--
HIGH PASS AF FILTER	SENSe:FILTer:HPASs[:STATe] ON|OFF SENSe:FILTer:HPASs:FREQuency <numeric_value>
LOW PASS AF FILTER	SENSe:FILTer[:LPASs][:STATe] ON|OFF SENSe:FILTer[:LPASs]:FREQuency <numeric_value>
WEIGHTING AF FILTER	SENSe:FILTer:CCITt[:STATe] ON|OFF SENSe:FILTer:CMESsage[:STATe] ON|OFF
AF COUPL'G AC DC	SENSe:ADEMod:AF:COUPling AC|DC
SQUELCH ON OFF	SENSe:ADEMod:SQUelch[:STATe] ON|OFF
SQUELCH LEVEL	SENSe:ADEMod:SQUelch:LEVel <numeric_value>
SIDE BAND NORM INV	SENSe:ADEMod:SBANd NORMal|INVerse
AM/FM DEEMPH	SENSe:FILTer:DEMPhasis:TCONstant <numeric_value>
PRE DISPL ON OFF	SENSe:FILTer:DEMPhasis:LINK DISPlay|AUDio
MEAS RESULT	--
AM SIGNAL	CALCulate<1|2>:FEED 'XTIM: AM'
FM SIGNAL	CALCulate<1|2>:FEED 'XTIM:FM'
PM SIGNAL	CALCulate<1|2>:FEED 'XTIM:PM'
MODULATION SUMMARY	CALCulate<1|2>:FEED 'XTIM:AMSummary' CALCulate<1|2>:FEED 'XTIM:FMSummary' CALCulate<1|2>:FEED 'XTIM:PMSummary' CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:AM[:RESult?] PPEak | MPEak | MIDDle | RMS CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:FM[:RESult?] PPEak | MPEak | MIDDle | RMS | RDEV CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:PM[:RESult?] PPEak | MPEak | MIDDle | RMS CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:AFRequency[:RESult?] CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:FERRor[:RESult?] CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:SINad:RESult? CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:CARRier[:RESult?]
SUMMARY SETTINGS	--

AVERAGE HOLD ON	SENSe:MSUMmary:AHOLd[:STATe] ON|OFF
SWEEP COUNT	[SENSe:]SWEep:COUNt <numeric_value>
RELUNIT DB %	CALCulate<1|2>:UNIT:POWer DB|PCT
INDICATION ABS REL	SENSe:MSUMmary:MODE ABSolute | RELative
SET REFERENCE	SENSe:MSUMmary:REFerence <numeric_value>
MEAS-> REF	SENSe:MSUMmary:REFerence:AUTO ONCe
SINAD 1kHz ON OFF	CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:SINad[:STATe] CALCulate<1|2>:MARKer<1...4>:FUNCtion:ADEMod:SINad:RESult?
SUMMARY MEAS TIME	SENSe:MSUMmary:MTIMe <numeric_value>
REAL TIME ON OFF	SENSe:ADEMod:RTIMe[:STATe] ON|OFF
SENSITIV AF OUTPUT	OUTPut:AF:SENSitivity <numeric_value>
VOLUME	SYSTem:SPEaker:VOLume <numeric_value>
DEMOD BANDWIDTH	SENSe:BANDwidth|BWIDth:DEMod <numeric_value>
DEEMPHASIS ON OFF	SENSe:FILTer:DEMPhasis[:STATe] ON|OFF

3.9.4.3 FREQUENCY Key Group

CENTER	[SENSe:]FREQuency:CENTer <numeric_value>
CENTER FREQUENCY	[SENSe:]FREQuency:CENTer <numeric_value>
FREQUENCY OFFSET	[SENSe:]FREQuency:OFFSet <numeric_value>

3.9.4.4 LEVEL Key Group

REF	--
REF LEVEL	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RLEVel <numeric_value>
REF LEVEL OFFSET	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RLEVel:OFFSet <numeric_value>

RF ATTEN MANUAL	INPut:ATTenuation <numeric_value>
ATTEN AUTO NORMAL	INPut:ATTenuation:AUTO:MODE NORMal; INPut:ATTenuation:AUTO ON
ATTEN AUTO LOW NOISE	INPut:ATTenuation:AUTO:MODE LNOise; INPut:ATTenuation:AUTO ON
ATTEN AUTO LOW DIST	INPut:ATTenuation:AUTO:MODE LDIStortion; INPut:ATTenuation:AUTO ON
MIXER LEVEL	INPut:MIXer <numeric value>
RANGE	**--**
Y PER DIV	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:PDIVision <numeric value>
REF VALUE Y AXIS	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RVALue <numeric_value>
REF VALUE X AXIS	DISPlay[:WINDow<1|2>]:TRACe<1...4>:X[:SCALe]:RVALue <numeric_value>
REF VALUE POSITION	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RPOSition 0...100PCT
TIME/DIV	[SENSE]:SWEep:TIME <numeric_value>
SCALE UNIT	--
Y UNIT LOG[dB]	CALCulate<1|2>:UNIT:POWer DB
Y UNIT LINEAR	CALCulate<1|2>:UNIT:POWer UNITLESS
Y UNIT DEG	CALCulate<1|2>:UNIT:ANGLe DEG
Y UNIT RAD	CALCulate<1|2>:UNIT:ANGLe RAD
Y UNIT DBM	CALCulate<1|2>:UNIT:POWer DBM
Y UNIT VOLT	CALCulate<1|2>:UNIT:POWer VOLT
Y UNIT WATT	CALCulate<1|2>:UNIT:POWer WATT
X UNIT TIME	CALCulate:X:UNIT:TIME S
X UNIT SYMBOL	CALCulate:X:UNIT:TIME SYMB
SENSITIV AF OUTPUT	OUTPut:AF:SENSitivity <numeric_value>
VOLUME	SYSTem:SPEaker:VOLume <numeric_value>

3.9.4.5 INPUT Key

INPUT	
RF ATTEN MANUAL	INPut:ATTenuation <numeric_value>
ATTEN AUTO NORMAL	INPut:ATTenuation:AUTO:MODE NORMal; INPut:ATTenuation:AUTO ON
ATTEN AUTO LOW NOISE	INPut:ATTenuation:AUTO:MODE LNOise; INPut:ATTenuation:AUTO ON
ATTEN AUTO LOW DIST	INPut:ATTenuation:AUTO:MODE LDIStortion; INPut:ATTenuation:AUTO ON
MIXER LEVEL	INPut:MIXer <numeric value>
INPUT SELECT	--
RF INPUT 50 OHM	INPut:IMPedance 50
RF INPUT 75 OHM/RAM	INPut:IMPedance:CORRection RAM
RF INPUT 75OHM/RAZ	INPut:IMPedance:CORRection RAZ

3.9.4.6 MARKER Key Group

NORMAL	
MARKER 1..2	CALCulate<1|2>:MARKer<1...2>[:STATe] ON | OFF; CALCulate<1|2>:MARKer<1...2>:X <numeric value>; CALCulate<1|2>:MARKer<1...2>:Y?
POLAR MARKER R/I / MA/PH	CALCulate<1|2>:MARKer<1...2>:READout MPHase | RIMaginary
POLAR MARKER DEG/ RAD	CALCulate<1|2>:UNIT:ANGLe DEG | RAD
COUPLED MARKER	CALCulate<1|2>:MARKer<1...2>:COUPled[:STATe] ON | OFF
MARKER INFO	DISPlay:WINDow<1|2>:MINFo ON | OFF (indication)
ALL MARKER OFF	CALCulate<1|2>:MARKer<1...2>:AOFF
DELTA	
DELTA 1/2	CALCulate<1|2>:DELTamarker<1...2>:AOFF
DELTA MKR ABS / REL	CALCulate<1|2>:DELTamarker<1...2>:MODE ABSolute | RELative

ALL DELTA OFF	CALCulate<1|2>:DELTamarker<1...2>[:STATe] ON | OFF CALCulate<1|2>:DELTamarker<1...2>:X <numeric value> CALCulate<1|2>:DELTamarker<1...2>:Y?
MARKER SEARCH	
PEAK	CALCulate<1|2>:MARKer<1...2>:MAXimum[:PEAK] CALCulate<1|2>:DELTamarker<1...2>:MAXimum[:PEAK]
ACTIVE MKR / DELTA	--
MIN	CALCulate<1|2>:MARKer<1...2>:MINimum[:PEAK] CALCulate<1|2>:DELTamarker<1...2>:MINimum[:PEAK]
MAX |PEAK|	CALCulate<1|2>:MARKer<1...2>:MAXimum:APEak CALCulate<1|2>:DELTamarker<1...2>:MAXimum:APEak
SUMMARY ON OFF	CALCulate<1|2>:MARKer<1..2>:FUNCtion:SUMMary[:STATe] ON | OFF
SUMMARY MARKER	--
MAX |PEAK|	CALCulate<1|2>:MARKer<1..2>:FUNCtion:SUMMary:MAXimum[:STATe] ON | OFF CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:MAXimum:RESult?
+PEAK	CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:PPEak[:STATe] ON | OFF CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:PPEak:RESult?
-PEAK	CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:MPEak[:STATe] ON | OFF CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:MPEak:RESult?
±PEAK/2	CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:MIDDle[:STATe] ON | OFF CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:MIDDle:RESult?
RMS	CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:RMS[:STATe] ON | OFF CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:RMS:RESult?
MEAN	CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:MEAN[:STATe] ON | OFF CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:MEAN:RESult?
PEAK HOLD ON / OFF	CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:PHOLd ON | OFF
AVERAGE/HOLD ON / OFF	CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:AVERage ON | OFF
SWEEP COUNT	[SENSe:]SWEep:COUNt <numeric_value>
ALL SUM MKR OFF	CALCulate<1|2>:MARKer<1...2>:FUNCtion:SUMMary:AOFF
SEARCH LIMIT ON/OFF	CALCulate<1|2>:MARKer<1...2>:X:SLIMits[:STATe] ON | OFF
SELECT MARKER	--

MKR ->	
PEAK	CALCulate<1|2>:MARKer<1...2>:MAXimum[:PEAK] CALCulate<1|2>:DELTamarker<1...2>:MAXimum[:PEAK]
MKR → TRACE	CALCulate<1|2>:MARKer<1...4>:TRACe <numeric value>
SELECT MARKER	--
ACTIVE MKR / DELTA	no corresponding IEC/IEEE-bus command

3.9.4.7 LINES Key Group

D LINES	**--**
DISPLAY LINE 1/2	CALCulate<1|2>:DLINe<1|2>:STATe ON | OFF; CALCulate<1|2>:DLINe<1|2> <numeric_value>
REFERENCE LINE	CALCulate<1|2>:RLINe:STATe ON | OFF; CALCulate<1|2>:RLINe <numeric_value>
THRESHOLD LINE	CALCulate<1|2>:THReshold ON | OFF; CALCulate<1|2>:THReshold <numeric_value>
TIME/SYMB 1/2	CALCulate<1|2>:TLINe<1|2>:STATe ON | OFF; CALCulate<1|2>:TLINe<1|2> <numeric_value>
LIMITS	
SELECT LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:NAME <string>; CALCulate<1|2>:LIMit<1...8>:STATe ON | OFF
NEW LIMIT LINE	see EDIT LIMIT LINE
NAME	CALCulate<1|2>:LIMit<1...8>:NAME <string>
VALUES	no corresponding IEC/IEEE-bus command
INSERT VALUE	no corresponding IEC/IEEE-bus command
DELETE VALUE	no corresponding IEC/IEEE-bus command
SHIFT X LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:CONTrol:SHIFt <numeric_value>
SHIFT Y LIMIT LINE	CALCulate<1|2>:LIMit<1...8>:UPPer:SHIFt <numeric_value> CALCulate<1|2>:LIMit<1...8>:LOWer:SHIFt <numeric_value>
SAVE LIMIT LINE	automatically executed during IEC/IEEE-bus operation

EDIT LIMIT LINE

```
CALCulate<1|2>:LIMit<1...8>:UNIT  DBM| DBPW| WATT| DBUV | DBMV | VOLT |
                                  DBUA | AMPere| DB|
                                  DBUV_MHZ| DBMV_MHZ | DBUA_MHZ|
                                  DEG| RAD| S| HZ| PCT
CALCulate<1|2>:LIMit<1...8>:TRACe <numeric_value>
CALCulate<1|2>:LIMit<1...8>:COMMent 'string'
CALCulate<1|2>:LIMit<1...8>:CONTrol[:DATA] <num_value>,<num_value>..
CALCulate<1|2>:LIMit<1...8>:CONTrol:DOMain   FREQuency|TIME
CALCulate<1|2>:LIMit<1...8>:CONTrol:OFFset <numeric_value>
CALCulate<1|2>:LIMit<1...8>:CONTrol:MODE   RELative | ABSolute
CALCulate<1|2>:LIMit<1...8>:CONTrol:UNIT[:TIME] S | SYM
CALCulate<1|2>:LIMit<1...8>:CONTrol:SPACing LINear | LOGarithmic
CALCulate<1|2>:LIMit<1...8>:UPPer[:DATA] <num_value>,<num_value>..
CALCulate<1|2>:LIMit<1...8>:UPPer:STATe   ON | OFF
CALCulate<1|2>:LIMit<1...8>:UPPer:OFFset <numeric_value>
CALCulate<1|2>:LIMit<1...8>:UPPer:MARGin <numeric_value>
CALCulate<1|2>:LIMit<1...8>:UPPer:MODE   RELative | ABSolute
CALCulate<1|2>:LIMit<1...8>:UPPer:SPACing LINear | LOGarithmic
CALCulate<1|2>:LIMit<1...8>:LOWer[:DATA] <num_value>,<num_value>..
CALCulate<1|2>:LIMit<1...8>:LOWer:STATe ON | OFF
CALCulate<1|2>:LIMit<1...8>:LOWer:OFFset <numeric_value>
CALCulate<1|2>:LIMit<1...8>:LOWer:MARGin <numeric_value>
CALCulate<1|2>:LIMit<1...8>:LOWer:MODE   RELative | ABSolute
CALCulate<1|2>:LIMit<1...8>:LOWer:SPACing LINear | LOGarithmic
CALCulate<1|2>:LIMit<1...8>:FAIL?
CALCulate<1|2>:LIMit<1...8>:CLEar[:IMMediate]
```

COPY LIMIT LINE

```
CALCulate<1|2>:LIMit<1...8>:COPY 1...8 | <name>
```

DELETE LIMIT LINE

```
CALCulate<1|2>:LIMit<1...8>:DELete
```

X OFFSET

```
CALCulate<1|2>:LIMit<1...8>:CONTrol:OFFset <numeric_value>
```

Y OFFSET

```
CALCulate<1|2>:LIMit<1...8>:UPPer:OFFset <numeric_value>
CALCulate<1|2>:LIMit<1...8>:LOWer:OFFset <numeric_value>
```

3.9.4.8 TRACE Key Group

TRACE	--
CLEAR/WRITE	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE WRITe
VIEW	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE VIEW
BLANK	DISPlay[:WINDow<1|2>]:TRACe<1...4>[:STATe] OFF
CONTINUOUS WRITE	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE:CWRite ON|OFF
AVERAGE	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE AVERage
MAX HOLD	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE MAXHold
MIN HOLD	DISPlay[:WINDow<1|2>]:TRACe<1...4>:MODE MINHold
SWEEP COUNT	[SENSe:]SWEep:COUNt <numeric_value>

3.9.4.9 SWEEP Key Group

COUPLING	--
IF BW AUTO	[SENSe:]BANDwidth|BWIDth[:RESolution]:AUTO ON | OFF
IF BW MANUAL	[SENSe:]BANDwidth|BWIDth[:RESolution] <numeric_value>
MAIN PLL BANDWIDTH	[SENSe:]BANDwidth|BWIDth:PLL AUTO|HIGH|MEDium|LOW
SWEEP	
CONTINUOUS SWEEP	INITiate:CONTinuous ON; INITiate[:IMMediate]
SINGLE SWEEP	INITiate:CONTinuous OFF; INITiate[:IMMediate]
SWEEP COUNT	[SENSe:]SWEep:COUNt <numeric_value>
RESULT LENGTH	[SENSe:]DDEMod:TIME <numeric_value>

3.9.4.10 SWEEP Key Group - Digital Demodulation

FREE RUN	TRIGger[:SEQuence]:SOURce IMMediate
VIDEO	TRIGger[:SEQuence]:SOURce VIDeo TRIGger[:SEQuence]:LEVel:VIDeo <numeric value>
EXTERN	TRIGger[:SEQuence]:SOURce EXTernal TRIGger[:SEQuence]:LEVel:EXTernal <numeric value>
TRIGGER OFFSET	TRIGger[:SEQuence]:HOLDoff <numeric value>
SLOPE POS NEG	TRIGger[:SEQuence]:SLOPe POSitive|NEGative
FIND BURST ON OFF	[SENSe:]DDEMod:SEARch:PULSe:STATe ON | OFF
FIND SYNC ON OFF	[SENSe:]DDEMod:SEARch:SYNC:STATe ON | OFF
SYNC OFFSET	[SENSe:]DDEMod:SEARch:SYNC:OFFSET <numeric_value>
SYNC PATTERN	--
SELECT PATTERN	--
NEW SYNC PATTERN	[SENSe:]DDEMod:SEARch:SYNC:PATTern <string>
NAME	--
COMMENT	--
VALUE	[SENSe:]DDEMod:SEARch:SYNC:PATTern <string>
SAVE PATTERN	automatically executed during IEC/IEEE-bus operation
EDIT SYNC PATTERN	[SENSe:]DDEMod:SEARch:SYNC:PATTern <string>
DELETE PATTERN	--

3.9.4.11 SWEEP Key Group - Analog Demodulation

FREE RUN	TRIGger[:SEQuence]:SOURce IMMediate
VIDEO	TRIGger[:SEQuence]:SOURce VIDeo TRIGger[:SEQuence]:LEVel:VIDeo <numeric value>
EXTERN	TRIGger[:SEQuence]:SOURce EXTernal TRIGger[:SEQuence]:LEVel[:EXTernal] -5.0...+5.0V
AF SIGNAL	TRIGger[:SEQuence]:SOURce AF
SLOPE POS/NEG	TRIGger[:SEQuence]:SLOPe POSitive|NEGative
TRIGGER OFFSET	TRIGger[:SEQuence]:HOLDoff <numeric_value>

3.9.5 Tracking Generator Mode (Option FSE-B10/B11)

3.9.5.1 CONFIGURATION Key Group

MODE	
TRACKING GEN	--
SOURCE ON/OFF	OUTPut[:STATe] ON | OFF
SOURCE POWER	SOURce:POWer[:LEVel][:IMMediate][:AMPLitude] <numeric value>
POWER OFFSET	SOURce:POWer[:LEVel][:IMMediate]:OFFSet <numeric value>
SOURCE CAL	--
CAL TRANS	[SENSe:]CORRection:METHod TRANsmission [SENSe:]CORRection:COLLect[:ACQuire] THRough
CAL REFL SHORT	[SENSe:]CORRection:METHod REFLexion [SENSe:]CORRection:COLLect[:ACQuire] THRough
CAL REFL OPEN	[SENSe:]CORRection:METHod REFLexion [SENSe:]CORRection:COLLect[:ACQuire] OPEN
NORMALIZE	[SENSe:]CORRection[:STATe] ON | OFF
REF VALUE POSITION	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RPOSition 0...100PCT
REF VALUE	DISPlay[:WINDow<1|2>]:TRACe<1...4>:Y[:SCALe]:RVALue <numeric_value>
RECALL	[SENSe:]CORRection:RECall
FREQUENCY OFFSET	SOURce:FREQuency:OFFSet <numeric value>
MODULATION	--
EXT AM	SOURce:AM:STATe ON | OFF
EXT ALC	SOURce:POWer:ALC:SOURce INTernal | EXTernal
EXT FM	SOURce:FM:STATe ON | OFF
EXT I/Q	SOURce:DM:STATe ON | OFF

3.9.6 TV-Demodulation Mode (Option FSE-B3)

3.9.6.1 CONFIGURATION Key Group

MODE

TV DEMOD	[SENSe:]TV[:STATe] ON | OFF
VIDEO POL NEGATIVE	TRIGger[:SEQuence]:VIDeo:SSIGnal:POLarity NEGative
VIDEO POL POSITIVE	TRIGger[:SEQuence]:VIDeo:SSIGnal:POLarity POSitive
625 LINE SYSTEM	TRIGger[:SEQuence]:VIDeo:FORMat:LPFRame 625
525 LINE SYSTEM	TRIGger[:SEQuence]:VIDeo:FORMat:LPFRame 525
PICT/SOUND OFFSET	[SENSe:]TV:PSOFfset <numeric_value>
TV DEMOD OFF	[SENSe:]TV[:STATe] ON | OFF

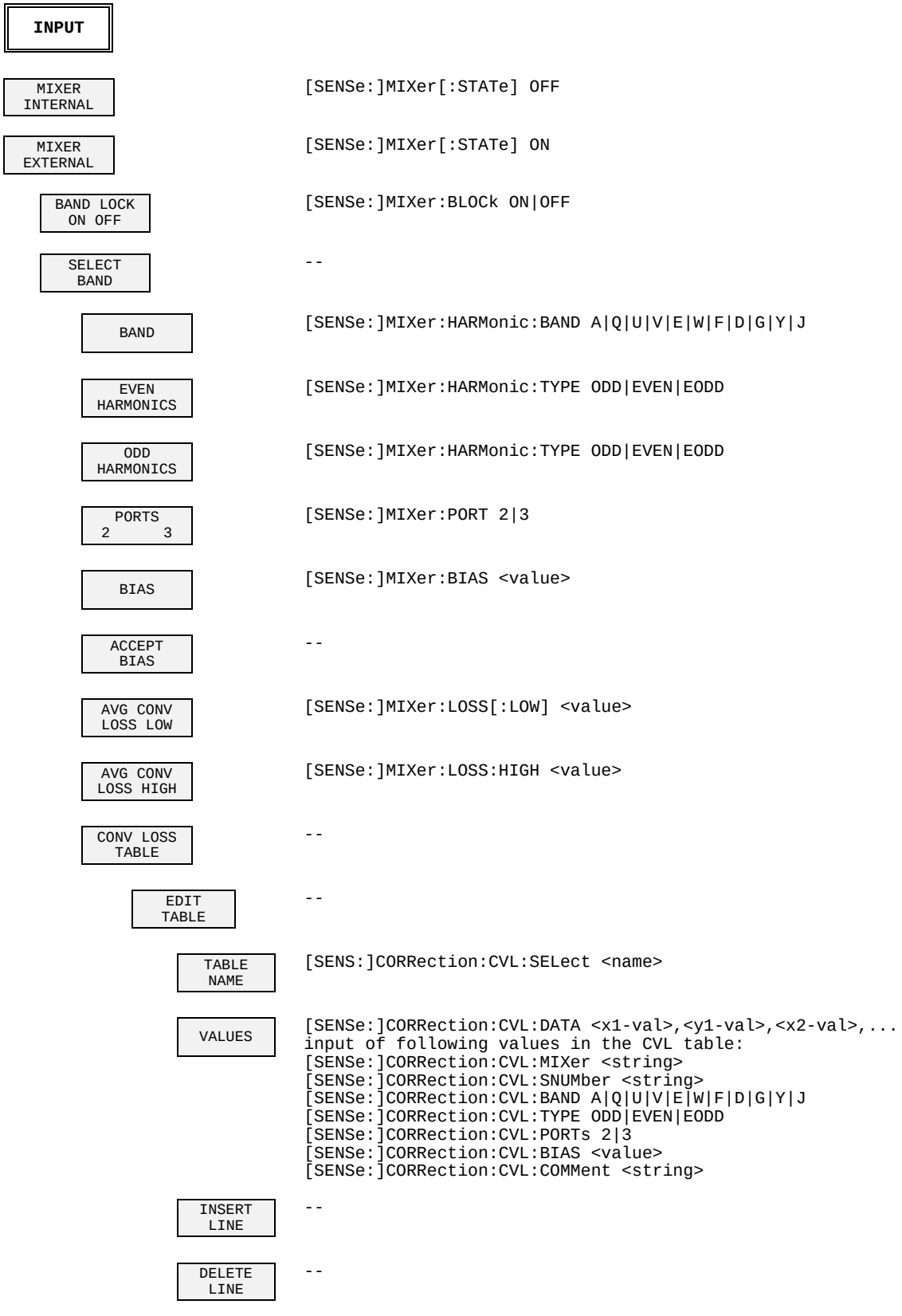
3.9.6.2 SWEEP Key Group

TRIGGER

TV	TRIGger[:SEQuence]:SOURce TV
TV TRIGGER SETTINGS	--
VERT SYNC	TRIGger[:SEQuence]:VIDeo:FIELd:SELect ALL
HOR SYNC	TRIGger[:SEQuence]:VIDeo:LINE:NUMBer <numeric_value>
VERT SYNC EVEN FIELD	TRIGger[:SEQuence]:VIDeo:FIELd:SELect EVEN
VERT SYNC ODD FIELD	TRIGger[:SEQuence]:VIDeo:FIELd:SELect ODD

3.9.7 External Mixer (Option FSE-B21)

3.9.7.1 INPUT Key Group



COPY TABLE	--
SAVE TABLE	table is saved with every change of values
PAGE UP	--
PAGE DOWN	--
NEW TABLE	see softkey EDIT TABLE
LOAD TABLE	--
DELETE TABLE	[SENSe:]CORRection:CVL:CLEar
PAGE UP	--
PAGE DOWN	--
DEFAULT SETTINGS	--
HARMONIC#	[SENSe:]MIXer:HARMonic <value>
PORTS 2 3	[SENSe:]MIXer:PORT 2|3
AVG CONV LOSS	[SENSe:]MIXer:LOSS[:LOW] <numeric_value>
BIAS	--
BIAS	[SENSe:]MIXer:BIAS <numeric_value>
BIAS OFF	--
SIGNAL ID	--
SIGNAL ID	[SENSe:]MIXer:SIGNal OFF|ON
AUTO ID	[SENSe:]MIXer:SIGNal OFF|AUTO
AUTO ID THRESHOLD	[SENSe:]MIXer:THReshold <value>