XDG Dual-Channel
Arbitrary Waveform Generator
Programmer Manual

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Representations and Warranties

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1. Introduction to the SCPI Language

1.1. Command Syntax

The command systems present a hierarchy structure (tree system) and each command consists of a “Root” keyword and one or multiple sub-keywords. The keywords are separated by ":" and are followed by the parameter settings available, "?" is added at the end of the command string to indicate query and the command and parameter are separated by "space".

1.2. Symbol Description

Following symbols are usually used to assist to explain the parameters contained in a command.

a) Braces { }
   The options enclosed in a { } are parameters available in the command. Only one option could be selected every time, and all the options are separated by “|”. For example, {ON|OFF} indicateds that ON or OFF can be selected.

b) Triangle Brackets < >
   The parameter enclosed in < > must be replaced by an effective value.

1.3. Programmed Parameter Type

The commands contain 8 kinds of parameters, different parameters have different setting methods.

(1) arbitrary block
A specified length of arbitrary data, for example,
#6377512xxxxx . . . where
6 indicates that the following 6 digits (377512) specify the length of the data in bytes;
xxxxx ... indicates the data or #0xxxxx...<LF><&EOI>

(2) boolean
Boolean numbers or values, for example,
ON or ≠ 0
OFF or 0

(3) discrete
A list of specific values, for example,
MIN, MAX

(4) NR1 numeric

Integers, for example,
0, 2, 30, -5

(5) NR2 numeric
Decimal numbers, for example,
0.6, 3.1415926, -2.6

(6) NR3 numeric
Floating point numbers, for example,
3.1415E-7, -8.2E3

(7) NRf numeric
Flexible decimal number that may be type NR1, NR2 or NR3
See NR1, NR2, and NR3 examples

(8) string
Alphanumeric characters (must be within quotation marks)
"Model, 123456"

1.4. Command Abbreviation

All the commands are case-insensitive, so you can use any kind of them. But if abbreviation is used, all the capital letters specified in commands must be written completely. For example,
SOURce1:FREQuency:FIXed 500kHz also can be:
SOUR1:FREQ:FIX 500kHz

2. Commands

AFGControl:CSCopy (No Query Form)

This command copies setup parameters for one channel to another channel.

Syntax
AFGControl:CSCopy {CH1|CH2},{CH1|CH2}

Arguments
CH1|CH2

Examples
AFGControl:CSCopy CH1,CH2
copies the CH1 setup parameters into CH2.

*CLS (No Query Form)

This command clears all the event registers and queues, which are used in the instrument status and event reporting system.

Syntax
*CLS

Arguments
None

Examples
*CLS
clears all the event registers and queues.

COUNter:COUPing

This command sets or queries the coupling mode of the counter to AC or DC.

Syntax

COUNter:COUPing [AC|DC]
COUNter:COUPing?

Arguments
AC means that AC is selected for the coupling mode of the counter.
DC means that DC is selected for the coupling mode of the counter.

Returns
AC|DC

Example
COUNter:COUPing DC
sets the coupling mode of the counter to DC.

COUNter:DUTYcycle? (Query Only)

This query-only command returns the measurement results for duty cycle of the counter.

Syntax
COUNter:DUTYcycle?

Arguments
None

Returns
<dutycycle>::=<NR3>

Examples
:COUNter:DUTYcycle?
might returns 2.265700368E+01.

COUNter:FREQ? (Query Only)

This query-only command returns the measurement results for frequency of the counter.

Syntax
COUNter:FREQ?

Arguments
None

Returns
<frequency>::=<NR3>

Examples
:COUNter:FREQ?
might returns 1.000082563E+02.

COUNter:HFR

This command enables or disables the high-frequency reject of the counter. The query returns the state of high-frequency reject of the counter.

Syntax
COUNter:HFR {ON|OFF|<NR1>}
COUNter:HFR?

Arguments
ON or <NR1>≠0 enables the high-frequency reject of the counter.
OFF or <NR1>=0 disables the high-frequency reject of the counter.

Returns
<NR1>

Examples
COUNter:HFR ON
enables the high-frequency reject of the counter.

COUNter:PERiod? (Query Only)

This query-only command returns the measurement results for period of the counter.

Syntax
COUNter:PERiod?

Arguments
None

Returns
<period>::=<NR3>

Examples
:COUNter:PERiod?
might returns 8.545000251E-03.

COUNter:PULSewidth? (Query Only)

This query-only command returns the measurement results for pulse width of the counter.

Syntax
COUNter:PULSewidth?

Arguments
None

Returns
<pulsewidth>::=<NR3>

Examples
:COUNter:PULSewidth?
might returns 366213017E-03.

COUNter:SENSitivity

This command sets or queries the trigger sensitivity of the counter.

Syntax
COUNter:SENSitivity [LOW|MIDDle|HIGH]
COUNter:SENSitivity?

Arguments
LOW means that Low is selected for the trigger sensitivity of the counter.
MIDDle means that Middle is selected for the trigger sensitivity of the counter.
HIGH means that High is selected for the trigger sensitivity of the counter.

Returns
LOW|MIDDle|HIGH

Example
COUNter:SENSitivity LOW

sets the trigger sensitivity of the counter to Low.

COUNter:TRIGger

This command sets or queries the trigger level of the counter.

Syntax
COUNter:TRIGger {<value>|MINimum|MAXimum}
COUNter:TRIGger? {MINimum|MAXimum}

Arguments
<value>::=<NR3>[<units>]
where:
<NR3> is the trigger level of the counter.
<units>::=[mV|V]

Returns
<value>

Examples
COUNter:TRIGger 500mV
sets the trigger level of the counter to 500 mV.

DISPlay:BRIGhtness

This command sets or queries the brightness of the LCD display.

Syntax
DISPlay:BRIGhtness {<brightness>|MINimum|MAXimum}
DISPlay:BRIGhtness?

Arguments
<brightness>::=<NR1>[<units>]
where:
<NR1> is a range of display brightness from 0 through 100. The larger the value, the higher the screen brightness.
<units>::=[PCT]
MINimum sets the display to the lowest brightness level.
MAXimum sets the display to the highest brightness level.

Returns
<NR1>

Examples
DISPLAY:BRIGHTNESS 90
sets the display brightness to 90%.

DISPlay:SAVer:DELay

This command sets or queries delay time for the screen saver function. The setting range is 1 minute to 999 minutes.

Syntax
DISPlay:SAVer:DELay {<minutes>|MINimum|MAXimum}
DISPlay:SAVer:DELay? {MINimum|MAXimum}

Arguments
<minutes>::=<NR1>[<units>]
where:
<NR1> is the delay time in minutes.
<units>::=MIN

Returns
<minutes>

Examples
DISPlay:SAVer:DELay 30
sets the delay time for the screen saver function to 30 minutes.

DISPlay:SAVer:IMMediate (No Query Form)

This command sets the screen saver state to ON, regardless of the DISPlay:SAVer[:STATe] command setting.
The screen saver is enabled immediately (without waiting for the delay time).

Syntax
DISPlay:SAVer:IMMediate

Arguments
None

Examples
DISPLAY:SAVER:IMMEDIATE
sets the screen saver state to ON.

DISPlay:SAVer[:STATe]

This command sets or queries the screen saver setting of the LCD display. When enabled, the screen saver function starts automatically if no operations are applied to the instrument front panel for the delay time set in DISPlay:SAVer:DELay.

Syntax
DISPlay:SAVer[:STATe] {ON|OFF|<NR1>}
DISPlay:SAVer[:STATe]?

Arguments
ON or <NR1>≠0 enables the screen saver function.
OFF or <NR1>=0 disables the screen saver function.

Returns
<NR1>
indicating the screen saver state.

Examples
DISPLAY:SAVER:STATE OFF
disables the screen saver function.

HCOPy:SDUMp:DATA? (Query Only)

This query-only command returns a specified length of binary data which consist a BMP screen image.

Syntax
HCOPy:SDUMp:DATA?

Arguments
None

Returns
<data>::=<arbitrary block>

Examples
HCOPy:SDUMp:DATA?
might return the following response:
#6377512xxxxx . . . where
6 indicates that the following 6 digits (377512) specify the length of the data in bytes;
xxxxx ... indicates the BMP image data.

HCOPy:SDUMp[:IMMediate] (No Query Form)

This command copies a screen image and saves the image file to a USB memory. The default file name is n.BMP, where n is a consecutive number from 0. The image files are saved in a folder named Model/IMAGE (Model is the instrument model) in the USB memory.

Syntax
HCOPy:SDUMp[:IMMediate]

Arguments
None

Examples
HCOPY:SDUMP:IMMEDIATE
copies the screen image and may create a file 1.BMP in a USB memory.

*IDN? (Query Only)

This query-only command returns identification information on the instrument.

Syntax
*IDN?

Arguments
None

Returns
<Manufacturer>,<Model>,<Serial Number>,<Firmware Level>

Examples
*IDN?

might return the following response:
OWON,XDG3202,1837001,SCPI:99.0 FV:V1.2.0

MMEMory:CATalog? (Query Only)

This query-only command returns the current state of the mass storage system (USB memory).

Syntax
MMEMory:CATalog?

Arguments
None

Returns
<NR1>,<NR1>[,<file_name>,<file_type>,<file_size>]...
where:

The first <NR1> indicates that the total amount of storage currently used, in bytes. The second <NR1> indicates that the free space of mass storage, in bytes.
<file_name> is the name of directory or file. If the name exceeds 22 characters in length, it will be shortened to 8 characters (without suffix) in 8.3 name format.
<file_type> is DIR for directory, otherwise it is blank.
<file_size> is the size of the file, in bytes. This value will be 0 for directory.

Examples
The USB memory includes the Test_folder folder, a Firmware.upp file, and a memo.txt file.
MMEMory:CATalog? might return the following response:
21973685,16851047,"Test_folder,DIR,0",”Firmware.upp,,7791”,”memo.txt,,2566”

MMEMory:CDIRectory

This command changes the current working directory in the mass storage system.

Syntax
MMEMory:CDIRectory [<directory_name>]
MMEMory:CDIRectory?

Arguments
<directory_name>::=<string> indicates the current working directory for the mass storage

system.

Returns
<directory_name>::=<string>

Examples
MMEMory:CDIRectory ”/Test_folder/Case”
changes the current directory to /Test_folder/Case.

MMEMory:DELete (No Query Form)

This command deletes a file or directory from the mass storage system. If a specified file in the mass storage is not allowed to overwrite or delete, this command causes an error. You can delete a directory if it is empty.

Syntax
MMEMory:DELete <file_name>

Arguments
<file_name>::=<string> specifies a file to be deleted and should include full path.

Examples
MMEMory:DELete ”/Test_folder/Case/Firmware.upp”
deletes the Firmware.upp file from the /Test_folder/Case directory.

OUTPut[1|2]:IMPedance

This command sets the output load impedance for the specified channel. The specified value is used for amplitude, offset, and high/low level settings. You can set the impedance to any value from 1 Ω to 10 kΩ with a resolution of 1 Ω. The default value is 50 Ω.
The query returns the current load impedance setting in ohms. If the load impedance is set to INFinity, the query returns “9.9E+37”.

Syntax
OUTPut[1|2]:IMPedance {<ohms>|INFinity|MINimum|MAXimum}
OUTPut[1|2]:IMPedance? {MINimum|MAXimum}

Arguments
<ohms>::=<NR3>[<units>]
where:

<units>::=OHM
INFinity sets the load impedance to >10 kΩ.
MINimum sets the load impedance to 1 Ω.
MAXimum sets the load impedance to 10 kΩ.

Returns
<ohms>::=<NR3>

Examples
OUTPut1:IMPedance MAXimum
sets the CH1 load impedance to 10 kΩ.

OUTPut[1|2][:STATe]

This command sets or query the instrument output state for the specified channel.

Syntax
OUTPut[1|2][:STATe] {ON|OFF|<NR1>}
OUTPut[1|2][:STATe]?

Arguments
ON or <NR1>≠0 enables the instrument output.
OFF or <NR1>=0 disables the instrument output.

Returns
<NR1>

Examples
OUTPut1:STATe ON
sets the instrument CH1 output to ON.

*RCL (No Query Form)

This command restores the state of the instrument from a copy of the settings stored in the setup memory. The settings are stored using the *SAV command. If the specified setup memory is deleted, this command causes an error.

Syntax
*RCL {0|1|2|…|14|15}

Arguments
0, 1, 2, … 14, or 15 specifies the location of setup memory.

Examples
*RCL 3
restores the instrument from a copy of the settings stored in memory location 3.

*RST (No Query Form)

This command resets the instrument to the factory default settings.

Syntax
*RST

Arguments
None

Examples
*RST
resets the instrument settings to the factory defaults.

*SAV (No Query Form)

This command stores the current settings of the arbitrary function generator to a specified setup memory location.

Syntax
*SAV {0|1|2|…|14|15}

Arguments
0, 1, 2, … 14, or 15 specifies the location of setup memory.

Examples
*SAV 3
saves the current instrument state in the memory location 3.

[SOURce[1|2]]:AM[:DEPTh]

This command sets or queries the modulation depth of AM modulation for the specified channel. Set the modulation depth from 0% to 100% with resolution of 1%.

Syntax
[SOURce[1|2]]:AM[:DEPTh] {<depth>|MINimum|MAXimum}
[SOURce[1|2]]:AM[:DEPTh]? [MINimum|MAXimum]

Arguments
<depth>::=<NR2>[<units>]
where:
<NR2> is the depth of modulating frequency.
<units>::=PCT
MINimum sets the modulation depth to minimum value. MAXimum sets the modulation depth to maximum value.

Returns
<depth>

Examples
SOURce1:AM:DEPth MAXimum
sets the depth of modulating signal on CH1 to the maximum value.

[SOURce[1|2]]:AM:INTernal:FREQuency

This command sets or queries the internal modulation frequency of AM modulation for the specified channel. Use this command when the internal modulation source is selected. Set the internal modulation frequency from 2 mHz to 100.00 kHz with resolution of 1 mHz.

Syntax
[SOURce[1|2]]:AM:INTernal:FREQuency {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:AM:INTernal:FREQuency? [MINimum|MAXimum]

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the modulation frequency.
<units>::=[Hz|kHz|MHz]

Returns

<frequency>

Examples
SOURce1:AM:INTernal:FREQuency 10kHz
sets the CH1 internal modulation frequency to 10 kHz.

[SOURce[1|2]]:AM:INTernal:FUNCtion

This command sets or queries the modulating waveform of AM modulation for the specified channel. Use this command when the internal modulation source is selected. If you specify EFILe when there is no EFILe or the EFILe is not yet defined, this command causes an error.

Syntax
[SOURce[1|2]]:AM:INTernal:FUNCtion {SINusoid|SQUare|RAMP|PRNoise |USER<NR1>|EMEMory|EFILe}
[SOURce[1|2]]:AM:INTernal:FUNCtion?

Arguments
USER<NR1>|EMEMory
<NR1> specifies the user waveform memory location, can be any number from 0 to 15. A user defined waveform saved in the user waveform memory or the EMEMory can be selected as a modulating signal.
EFILe
EFILe is used as a modulating signal.

Returns
SIN|SQU|RAMP|PRN|USER<NR1>|EMEMory|EFILe

Examples
SOURce1:AM:INTernal:FUNCtion SQUare
selects Square as the shape of modulating waveform for the CH1 output.

[SOURce[1|2]]:AM:INTernal:FUNCtion:EFILe

This command sets or queries an EFILe name used as a modulating waveform for AM modulation. A file name must be specified in the mass storage system. This command returns “ ” if there is no file in the mass storage.

Syntax

[SOURce[1|2]]:AM:INTernal:FUNCtion:EFILe <file_name>
[SOURce[1|2]]:AM:INTernal:FUNCtion:EFILe?

Arguments
<file_name>::=<string> specifies a file name in the mass storage system. The <file_name> includes path. Path separators are forward slashes (/).

Returns
<file_name>

Examples
SOURce1:AM:INTernal:FUNCtion:EFILe “TEST”
sets a file named “TEST” in the mass storage.

[SOURce[1|2]]:AM:SOURce

This command sets or queries the source of modulating signal of AM modulation for the specified channel.

Syntax
[SOURce[1|2]]:AM:SOURce [INTernal|EXTernal]
[SOURce[1|2]]:AM:SOURce?

Arguments
INTernal means that the carrier waveform is modulated with an internal source.
EXTernal means that the carrier waveform is modulated with an external source.

Returns
INT|EXT

Examples
SOURce1:AM:SOURce INTernal
sets the CH1 source of modulating signal to internal.

[SOURce[1|2]]:AM:STATe

This command enables or disables AM modulation for the specified channel. The query returns the state of AM modulation.

Syntax

[SOURce[1|2]]:AM:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:AM:STATe?

Arguments
If [SOURce[1|2]] are omitted, CH1 is specified automatically.
ON or <NR1>≠0 enables AM modulation.
OFF or <NR1>=0 disables AM modulation.

Returns
<NR1>

Examples
SOURce1:AM:STATe ON
enables the CH1 AM modulation.

[SOURce[1|2]]:ASKey[:AMPLitude]

This command sets or queries the modulation amplitude of ASK modulation for the specified channel. Set the modulation amplitude from 0 Vpp to the current amplitude of the carrier waveform. The amplitude resolution is 1 mVpp or four digits.

Syntax
[SOURce[1|2]]:ASKey[:AMPLitude] {<amplitude>|MINimum|MAXimum}
[SOURce[1|2]]:ASKey[:AMPLitude]? [MINimum|MAXimum]

Arguments
<amplitude>::=<NRf>[<units>]
where:
<NRf> is the modulation amplitude.
<units>::=[mVpp|Vpp]
MINimum sets the modulation amplitude to minimum value.
MAXimum sets the modulation amplitude to maximum value.

Returns
<amplitude>

Examples
SOURce1:ASKey:AMPLitude MAXimum
sets the amplitude of modulating signal on CH1 to the maximum value.

[SOURce[1|2]]:ASKey:INTernal:RATE

This command sets or queries the internal modulation rate of ASK modulation for the specified channel. Use this command when the internal modulation source is selected.

Syntax
[SOURce[1|2]]:ASKey:INTernal:RATE {<rate>|MINimum|MAXimum}
[SOURce[1|2]]:ASKey:INTernal:RATE? {MINimum|MAXimum}

Arguments
<rate>::=<NRf>[<units>]
where:
<NRf> is the modulation rate.
<units>::=[Hz|kHz|MHz]

Returns
<rate>

Examples
SOURce1:ASKey:INTernal:RATE 50Hz
sets the CH1 internal modulation rate to 50 Hz.

[SOURce[1|2]]:ASKey:SOURce

This command sets or queries the source of modulation signal of ASK modulation for the specified channel.

Syntax
[SOURce[1|2]]:ASKey:SOURce [INTernal|EXTernal]
[SOURce[1|2]]:ASKey:SOURce?

Arguments
INTernal means that the carrier waveform is modulated with an internal source.
EXTernal means that the carrier waveform is modulated with an external source.

Returns
INT|EXT

Examples
SOURce1:ASKey:SOURce INTernal
sets the CH1 source of modulating signal to internal.

[SOURce[1|2]]:ASKey:STATe

This command enables or disables ASK modulation. The query returns the state of ASK modulation. Select a sine, square, ramp, or arbitrary waveform as the carrier waveform.

Syntax
[SOURce[1|2]]:ASKey:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:ASKey:STATe?

Arguments
ON or <NR1>≠0 enables ASK modulation.
OFF or <NR1>=0 disables ASK modulation.

Returns
<NR1>

Examples
SOURce1:ASKey:STATe ON
enables the CH1 ASK modulation.

[SOURce[1|2]]:BPSKey:DATA

This command sets or queries the data source of modulation signal of BPSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:BPSKey:DATA [01|10|PN15|PN21]
[SOURce[1|2]]:BPSKey:DATA?

Arguments
01 means that the carrier waveform is modulated with 01 pattern.
10 means that the carrier waveform is modulated with 10 pattern.
PN15 means that the carrier waveform is modulated with PN15 pattern.
PN21 means that the carrier waveform is modulated with PN21 pattern.

Returns
01|10|PN15|PN21

Examples

SOURce1:BPSKey:DATA 01
sets the CH1 source of BPSK modulating signal to 01 pattern.

[SOURce[1|2]]:BPSKey:INTernal:RATE

This command sets or queries the internal modulation rate of BPSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:BPSKey:INTernal:RATE {<rate>|MINimum|MAXimum}
[SOURce[1|2]]:BPSKey:INTernal:RATE? {MINimum|MAXimum}

Arguments
<rate>::=<NRf>[<units>]
where:
<NRf> is the modulation rate.
<units>::=[Hz|kHz|MHz]

Returns
<rate>

Examples
SOURce1:BPSKey:INTernal:RATE 50Hz
sets the CH1 internal BPSK modulation rate to 50 Hz.

[SOURce[1|2]]:BPSKey:PHASe

This command sets or queries the phase deviation of BPSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:BPSKey:PHASe {<phase>|MINimum|MAXimum}
[SOURce[1|2]]:BPSKey:PHASe? [MINimum|MAXimum]

Arguments
<phase>::=<NR3>[<units>]
where:
<NR3> is the phase deviation.
<units>::=[RAD|DEG]
If <units> are omitted, RAD is specified automatically. The setting ranges are:

RAD: 0 PI to +1 PI, relative to phase value
DEG: 0 to +180, in 1 degree steps, relative to phase value

Returns
<phase>

Examples
SOURce1:BPSKey:PHASe MAXimum
sets the maximum value for the CH1 phase deviation of BPSK modulation.

[SOURce[1|2]]:BPSKey:STATe

This command enables or disables BPSK modulation. The query returns the state of BPSK modulation. Select a sine, square, ramp, or arbitrary waveform as the carrier waveform.

Syntax
[SOURce[1|2]]:BPSKey:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:BPSKey:STATe?

Arguments
ON or <NR1>≠0 enables BPSK modulation.
OFF or <NR1>=0 disables BPSK modulation.

Returns
<NR1>

Examples
SOURce1:BPSKey:STATe ON
enables the CH1 BPSK modulation.

[SOURce[1|2]]:BURSt:GATE:POLarity

This command sets the generator to output a burst when the gated signal at the [Ext Trig/Burst/Fsk In] connector at the rear panel is high level or low level.
This command is only available in gated Burst mode.

Syntax
[SOURce[1|2]]:BURSt:GATE:POLarity{NORMal|INVerted}
[SOURce[1|2]]:BURSt:GATE:POLarity?

Arguments
NORMal sets the polarity to Normal.
INVerted sets the polarity to Inverted.

Returns
NORM|INV

Examples
SOURce1:BURSt:GATE:POLarity INVerted
sets the polarity to INVerted, means the instrument outputs a burst when the gated signal at the [Ext Trig/Burst/Fsk In] connector at the rear panel is low level.

[SOURce[1|2]]:BURSt:INTernal:PERiod

This command sets or queries the Burst period for the specified channel.

Syntax
[SOURce[1|2]]:BURSt:INTernal:PERiod {<period>|MINimum|MAXimum}
[SOURce[1|2]]:BURSt:INTernal:PERiod?[MINimum|MAXimum]

Arguments
<period>::=<NRf>[<units>]
where
<NRf> is the Burst period.
<units>::=[ns|us|ms|s]

Returns
<period>

Examples
SOURce1:BURSt:INTernal:PERiod 200ns
sets the CH1 Burst period to 200 ns.

[SOURce[1|2]]:BURSt:MODE

This command sets or queries the burst mode for the specified channel.

Syntax
[SOURce[1|2]]:BURSt:MODE {TRIGgered|GATed}

[SOURce[1|2]]:BURSt:MODE?

Arguments
TRIGgered means that triggered mode is selected for burst mode.
GATed means that gated mode is selected for burst mode.

Returns
TRIG|GAT

Examples
SOURce1:BURSt:MODE TRIGgered
selects triggered mode.

[SOURce[1|2]]:BURSt:NCYCles

This command sets or queries the number of cycles (burst count) to be output in burst mode for the specified channel. The query returns 9.9E+37 if the burst count is set to INFinity.

Syntax
[SOURce[1|2]]:BURSt:NCYCles {<cycles>|INFinity|MINimum|MAXimum}
[SOURce[1|2]]:BURSt:NCYCles? {MINimum|MAXimum}

Arguments
<cycles>::=<NRf>
where:
<NRf> is the burst count. The burst count ranges from 1 to 500,000.
INFinity sets the burst count to infinite count.
MINimum sets the burst count to minimum count.
MAXimum sets the burst count to maximum count.

Returns
<cycles>

Examples
SOURce1:BURSt:NCYCles 2
sets the CH1 burst count to 2.

[SOURce[1|2]]:BURSt:SOURce

This command sets or queries the trigger source in the burst mode for the specified channel. This command is available only in the Triggered burst mode.

Syntax
[SOURce[1|2]]:BURSt:SOURce [TIMer|MANual|EXTernal]
[SOURce[1|2]]:BURSt:SOURce?

Arguments
TIMer specifies an internal clock as the trigger source.
MANual specifies a manual trigger input as the trigger source.
EXTernal specifies an external trigger input as the trigger source.

Returns
TIM|MAN|EXT

Examples
SOURce1:BURSt:SOURce EXTernal
sets an external trigger input as the trigger source in the burst mode.

[SOURce[1|2]]:BURSt:STATe

This command enables or disables the burst mode for the specified channel. The query returns the state of burst mode.

Syntax
[SOURce[1|2]]:BURSt:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:BURSt:STATe?

Arguments
ON or <NR1>≠0 enables the burst mode.
OFF or <NR1>=0 disables the burst mode.

Returns
<NR1>

Examples
SOURce1:BURSt:STATe ON
enables the burst mode for the CH1.

[SOURce[1|2]]:FM[:DEViation]

This command sets or queries the peak frequency deviation of FM modulation for the specified channel. The setting range of frequency deviation depends on the waveform selected as the carrier.

Syntax
[SOURce[1|2]]:FM[:DEViation] {<deviation>|MINimum|MAXimum}
[SOURce[1|2]]:FM[:DEViation]? [MINimum|MAXimum]

Arguments
<deviation>::=<NRf>[<units>]
where:
<NRf> is the frequency deviation.
<units>::=[Hz|kHz|MHz]

Returns
<deviation>

Examples
SOURce1:FM:DEViation 1.0MHz
sets the CH1 frequency deviation to 1.0 MHz.

[SOURce[1|2]]:FM:INTernal:FREQuency

This command sets or queries the internal modulation frequency of FM modulation for the specified channel. Use this command when the internal modulation source is selected.

Set the internal modulation frequency from 2 mHz to 100.00 kHz with resolution of 1 mHz.

Syntax
[SOURce[1|2]]:FM:INTernal:FREQuency {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:FM:INTernal:FREQuency? [MINimum|MAXimum]

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the modulation frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:FM:INTernal:FREQuency 10kHz
sets the CH1 internal modulation frequency to 10 kHz.

[SOURce[1|2]]:FM:INTernal:FUNCtion

This command sets or queries the modulating waveform of FM modulation for the specified channel. Use this command when the internal modulation source is selected. If you specify EFILe when there is no EFILe or the EFILe is not yet defined, this command causes an error.

Syntax
[SOURce[1|2]]:FM:INTernal:FUNCtion {SINusoid|SQUare|RAMP|PRNoise |USER<NR1>|EMEMory|EFILe}
[SOURce[1|2]]:FM:INTernal:FUNCtion?

Arguments
USER<NR1>|EMEMory
<NR1> specifies the user waveform memory location, can be any number from 0 to 15. A user defined waveform saved in the user waveform memory or the EMEMory can be selected as a modulating signal.
EFILe
EFILe is used as a modulating signal.

Returns
SIN|SQU|RAMP|PRN|USER<NR1>|EMEMory|EFILe

Examples
SOURce1:FM:INTernal:FUNCtion SQUare
selects Square as the shape of modulating waveform for the CH1 output.

[SOURce[1|2]]:FM:INTernal:FUNCtion:EFILe

This command sets or queries an EFILe name used as a modulating waveform for FM modulation. A file name must be specified in the mass storage system. This command returns “ ” if there is no file in the mass storage.

Syntax
[SOURce[1|2]]:FM:INTernal:FUNCtion:EFILe <file_name>
[SOURce[1|2]]:FM:INTernal:FUNCtion:EFILe?

Arguments
<file_name>::=<string> specifies a file name in the mass storage system. The <file_name> includes path. Path separators are forward slashes (/).

Returns
<file_name>

Examples
SOURce1:FM:INTernal:FUNCtion:EFILe “TEST”
sets a file named “TEST” in the mass storage.

[SOURce[1|2]]:FM:SOURce

This command sets or queries the source of modulating signal of FM modulation for the specified channel.

Syntax
[SOURce[1|2]]:FM:SOURce [INTernal|EXTernal]
[SOURce[1|2]]:FM:SOURce?

Arguments
INTernal means that the carrier waveform is modulated with the internal source.
EXTernal means that the carrier waveform is modulated with an external source.

Returns
INT|EXT

Examples
SOURce1:FM:SOURce INTernal
sets the CH1 source of modulating signal to internal.

[SOURce[1|2]]:FM:STATe

This command enables or disables FM modulation. The query returns the state of FM modulation.

Syntax
[SOURce[1|2]]:FM:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:FM:STATe?

Arguments
ON or <NR1>≠0 enables FM modulation.
OFF or <NR1>=0 disables FM modulation.

Returns
<NR1>

Examples
SOURce1:FM:STATe ON
enables the CH1 FM modulation.

[SOURce[1|2]]:FREQuency:CENTer

This command sets or queries the center frequency of sweep for the specified channel. This command is always used with the [SOURce[1|2]]:FREQuency:SPAN command. The setting range of center frequency depends on the waveform selected for sweep.

Syntax
[SOURce[1|2]]:FREQuency:CENTer {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:FREQuency:CENTer? {MINimum|MAXimum}

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the center frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:FREQuency:CENTer 550kHz
sets the CH1 center frequency to 550 kHz.

[SOURce[1|2]]:FREQuency:CONCurrent

This command enables or disables the function to copy the frequency (or period) of one channel to another channel.

The[SOURce[1|2]]:FREQuency:CONCurrent command copies the frequency (or period) of the channel specified by the header suffix to another channel. If you specify CH1 with the header, the CH1 frequency will be copied to CH2.

When the concurrent copy function is enabled, the FreqLock function is also enabled automaticlly. Use general knob to adjust frequency (or period) of the two channels sychronously.

The[SOURce[1|2]]:FREQuency:CONCurrent? command returns “0” (off) or “1” (on).

Syntax
[SOURce[1|2]]:FREQuency:CONCurrent {ON|OFF|<NR1>}
[SOURce[1|2]]:FREQuency:CONCurrent?

Arguments
ON or <NR1>≠0 enables the concurrent copy function.
OFF or <NR1>=0 disables the concurrent copy function.

Returns
<NR1>

Examples
SOURce1:FREQuency:CONCurrent ON
copies the frequency value of CH1 to CH2.

[SOURce[1|2]]:FREQuency[:FIXed]

This command sets or queries the frequency of output waveform for the specified channel. The setting range of output frequency depends on the type of output waveform. If you change the type of output waveform, it might change the output frequency because changing waveform types impacts on the setting range of output frequency. The resolution is 1 μHz or 12 digits.

Syntax
[SOURce[1|2]]:FREQuency[:FIXed] {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:FREQuency[:FIXed]? {MINimum|MAXimum}

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the output frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:FREQuency:FIXed 500kHz
sets the CH1 output frequency to 500 kHz.

[SOURce[1|2]]:FREQuency:SPAN

This command sets or queries the span of frequency sweep for the specified channel. This command is always used with the [SOURce[1|2]]:FREQuency:CENTer command. The setting range of frequency span depends on the waveform selected for sweep.

Syntax
[SOURce[1|2]]:FREQuency:SPAN {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:FREQuency:SPAN? {MINimum|MAXimum}

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the frequency span.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:FREQuency:SPAN 900 kHz
sets the CH1 frequency span to 900 kHz.

[SOURce[1|2]]:FREQuency:STARt

This command sets or queries the start frequency of sweep for the specified channel. This

command is always used with the [SOURce[1|2]]:FREQuency:STOP command. The setting range of start frequency depends on the waveform selected for sweep.

Syntax
[SOURce[1|2]]:FREQuency:STARt {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:FREQuency:STARt? {MINimum|MAXimum}

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the start frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:FREQuency:STARt 10kHz
sets the sweep start frequency of CH1 to 10 kHz.

[SOURce[1|2]]:FREQuency:STOP

This command sets or queries the stop frequency of sweep for the specified channel. This command is always used with the [SOURce[1|2]]:FREQuency:STARt command. The setting range of stop frequency depends on the waveform selected for sweep.

Syntax
[SOURce[1|2]]:FREQuency:STOP {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:FREQuency:STOP? {MINimum|MAXimum}

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the stop frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:FREQuency:STOP 100KHz
sets the stop frequency of CH1 to 100 kHz.

[SOURce[1|2]]:FSKey[:FREQuency]

This command sets or queries the hop frequency of FSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:FSKey[:FREQuency] {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:FSKey[:FREQuency]? {MINimum|MAXimum}

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the hop frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:FSKey:FREQuency 1.0MHz
sets the hop frequency of CH1 FSK modulation to 1.0 MHz.

[SOURce[1|2]]:FSKey:INTernal:RATE

This command sets or queries the internal modulation rate of FSK modulation for the specified channel. Use this command when the internal modulation source is selected.

Syntax
[SOURce[1|2]]:FSKey:INTernal:RATE {<rate>|MINimum|MAXimum}
[SOURce[1|2]]:FSKey:INTernal:RATE? {MINimum|MAXimum}

Arguments
<rate>::=<NRf>[<units>]
where:
<NRf> is the modulation rate.
<units>::=[Hz|kHz|MHz]

Returns
<rate>

Examples
SOURce1:FSKey:INTernal:RATE 50Hz
sets the CH1 internal FSK modulation rate to 50 Hz.

[SOURce[1|2]]:FSKey:SOURce

This command sets or queries the source of modulation signal of FSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:FSKey:SOURce [INTernal|EXTernal]
[SOURce[1|2]]:FSKey:SOURce?

Arguments
INTernal means that the carrier waveform is modulated with an internal source.
EXTernal means that the carrier waveform is modulated with an external source.

Returns
INT|EXT

Examples
SOURce1:FSKey:SOURce INTernal
sets the CH1 source of modulating signal to internal.

[SOURce[1|2]]:FSKey:STATe

This command enables or disables FSK modulation. The query returns the state of FSK modulation. Select a sine, square, ramp, or arbitrary waveform as the carrier waveform.

Syntax
[SOURce[1|2]]:FSKey:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:FSKey:STATe?

Arguments
ON or <NR1>≠0 enables FSK modulation.
OFF or <NR1>=0 disables FSK modulation.

Returns
<NR1>

Examples
SOURce1:FSKey:STATe ON
enables the CH1 FSK modulation.

[SOURce[1|2]]:3FSKey[:FREQuency]

This command sets or queries the hop frequency of 3FSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:3FSKey[:FREQuency] <n>,{<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:3FSKey[:FREQuency]? <n>,{MINimum|MAXimum}

Arguments
<n>::=<NR1>
where:
<NR1> is the sequence number of hop frequency, which can be 1 or 2.

<frequency>::=<NRf>[<units>]
where:
<NRf> is the hop frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:3FSKey:FREQuency 2,1.0MHz
sets the hop frequency 2 of CH1 3FSK modulation to 1.0 MHz.

[SOURce[1|2]]:3FSKey:INTernal:RATE

This command sets or queries the internal modulation rate of 3FSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:3FSKey:INTernal:RATE {<rate>|MINimum|MAXimum}
[SOURce[1|2]]:3FSKey:INTernal:RATE? {MINimum|MAXimum}

Arguments
<rate>::=<NRf>[<units>]
where:
<NRf> is the modulation rate.
<units>::=[Hz|kHz|MHz]

Returns
<rate>

Examples
SOURce1:3FSKey:INTernal:RATE 50Hz
sets the CH1 internal 3FSK modulation rate to 50 Hz.

[SOURce[1|2]]:3FSKey:STATe

This command enables or disables 3FSK modulation. The query returns the state of 3FSK modulation. Select a sine, square, ramp, or arbitrary waveform as the carrier waveform.

Syntax
[SOURce[1|2]]:3FSKey:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:3FSKey:STATe?

Arguments
ON or <NR1>≠0 enables 3FSK modulation.
OFF or <NR1>=0 disables 3FSK modulation.

Returns
<NR1>

Examples
SOURce1:3FSKey:STATe ON
enables the CH1 3FSK modulation.

[SOURce[1|2]]:4FSKey[:FREQuency]

This command sets or queries the hop frequency of 4FSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:4FSKey[:FREQuency] <n>,{<frequency>|MINimum|MAXimum}

[SOURce[1|2]]:4FSKey[:FREQuency]? <n>,{MINimum|MAXimum}

Arguments
<n>::=<NR1>
where:
<NR1> is the sequence number of hop frequency, which can be 1, 2, or 3.

<frequency>::=<NRf>[<units>]
where:
<NRf> is the hop frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:4FSKey:FREQuency 2,1.0MHz
sets the hop frequency 2 of CH1 4FSK modulation to 1.0 MHz.

[SOURce[1|2]]:4FSKey:INTernal:RATE

This command sets or queries the internal modulation rate of 4FSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:4FSKey:INTernal:RATE {<rate>|MINimum|MAXimum}
[SOURce[1|2]]:4FSKey:INTernal:RATE? {MINimum|MAXimum}

Arguments
<rate>::=<NRf>[<units>]
where:
<NRf> is the modulation rate.
<units>::=[Hz|kHz|MHz]

Returns
<rate>

Examples
SOURce1:4FSKey:INTernal:RATE 50Hz
sets the CH1 internal 4FSK modulation rate to 50 Hz.

[SOURce[1|2]]:4FSKey:STATe

This command enables or disables 4FSK modulation. The query returns the state of 4FSK modulation. Select a sine, square, ramp, or arbitrary waveform as the carrier waveform.

Syntax
[SOURce[1|2]]:4FSKey:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:4FSKey:STATe?

Arguments
ON or <NR1>≠0 enables 4FSK modulation.
OFF or <NR1>=0 disables 4FSK modulation.

Returns
<NR1>

Examples
SOURce1:4FSKey:STATe ON
enables the CH1 4FSK modulation.

[SOURce[1|2]]:FUNCtion:EFILe

This command sets or queries an EFILe name used as an output waveform. A file name must be specified in the mass storage system. This command returns “ ” if there is no file in the mass storage.

Syntax
[SOURce[1|2]]:FUNCtion:EFILe <file_name>
[SOURce[1|2]]:FUNCtion:EFILe?

Arguments
<file_name>::=<string> specifies a file name in the mass storage system. The <file_name> includes path. Path separators are forward slashes (/).
NOTE: The <file_name> argument is case sensitive.

Returns
<file_name>

Examples
SOURce1:FUNCtion:EFILe “TEST”
sets a file named “TEST” in the mass storage.

[SOURce[1|2]]:FUNCtion:RAMP:SYMMetry

This command sets or queries the symmetry of ramp waveform for the specified channel. The setting range is 0.0% to 100.0%.

Syntax
[SOURce[1|2]]:FUNCtion:RAMP:SYMMetry {<symmetry>|MINimum|MAXimum}
[SOURce[1|2]]:FUNCtion:RAMP:SYMMetry?

Arguments
<symmetry>::=<NR2>[<units>]
where:
<NR2> is the symmetry.
<units>::=PCT

Returns
<symmetry>

Examples
SOURce1:FUNCtion:RAMP:SYMMetry 80.5
sets the symmetry of the CH1 ramp waveform to 80.5%.

[SOURce[1|2]]:FUNCtion[:SHAPe]

This command sets or queries the shape of the output waveform. When the specified user memory is deleted, this command causes an error if you select the user memory.

Syntax
[SOURce[1|2]]:FUNCtion[:SHAPe] {SINusoid|SQUare|PULSe|RAMP
|PRNoise|<Built_in>|USER<NR1>|EMEMory|EFILe}
[SOURce[1|2]]:FUNCtion[:SHAPe]?

Arguments
<Built_in>::={DC|AbsSine|AbsSineHalf|AmpALT|AttALT|GaussPulse|NegRamp|NPulse|PPulse|
SineTra|SineVer|StairDn|StairUD|StairUp|Trapezia|Heart|Cardiac|LFPulse|Tens1|Tens2|Tens3|
EOG|EEG|Pulseilogram|ResSpeed|Ignition|TP2A|ISP|VR|TP1|TP2B|P4|TP5A|TP5B|SCR|Surge|
Airy|Besselj|Bessely|Cauchy|X^3|Erf|Erfc|ErfcInv|ErfInv|Dirichlet|ExpFall|ExpRise|Laguerre|
Laplace|Legend|Gauss|HaverSine|Log|LogNormal|Lorentz|Maxwell|Rayleigh|Versiera|
Weibull|Ln(x)|X^2|Round|Chirp|Rhombus|CosH|Cot|CotH|CotHCon|CotHPro|CscCon|Csc|

CscPro|CscH|CscHCon|CscHPro|RecipCon|RecipPro|SecCon|SecPro|SecH|Sinc|SinH|Sqrt|Tan|TanH|ACos|ACosH|ACot|ACotCon|ACotPro|ACotH|ACotHCon|ACotHPro|Acsc|ACscCon|ACscPro|AcscH|ACscHCon|ACscHPro|Asec|ASecCon|ASecPro|ASecH|ASin|ASinH|ATan|ATanH|Bartlett|BarthannWin|Blackman|BlackmanH|BohmanWin|Boxcar|ChebWin|FlattopWin|Hamming|Hanning|Kaiser|NuttallWin|ParzenWin|TaylorWin|Triang|TukeyWin|Butterworth|Combin|CPulse|CWPulse|RoundHalf|BandLimited|BlaseiWave|Chebyshev1|Chebyshev2|DampedOsc|DualTone|Gamma|GateVibar|LFMPulse|MCNoise|Discharge|Quake|Radar|Ripple|RoundsPM|StepResp|SwingOsc|TV|Voice|AM|FM|PM|PWM}

NOTE: The arguments defined in <Built_in> can not be abbreviated, all the upper and lower case letters are needed.

This command selects the output waveform of the instrument when Mod, Sweep and Burst are disabled.
This command selects the carrier waveform corresponding to the function when Mod, Sweep or Burst is currently enabled.

If you specify EFILe when there is no EFILe or the EFILe is not yet defined, this command causes an error.

If you change the type of output waveform, it might change the output frequency because changing waveform types impacts the setting range of output frequency.

USER<NR1>|EMEMory
<NR1> specifies the user waveform memory location, can be any number from 0 to 31.

A user defined waveform saved in the user waveform memory or the EMEMory can be selected as an output waveform.

EFILe
EFILe is specified as an output waveform.

Returns
SIN|SQU|PULS|RAMP|PRN|<Built_in>|USER<NR1>|EMEMory|EFILe

Examples
SOURce1:FUNCtion:SHAPe SQUare
selects the shape of CH1 output waveform to square waveform.

[SOURce[1|2]]:HARMonic:AMPL

This command sets or queries the amplitude of the specified order of harmonic.

Syntax
[SOURce[1|2]]:HARMonic:AMPL <sn>,<amplitude>|MINimum|MAXimum
[SOURce[1|2]]:HARMonic:AMPL? <sn>[,MINimum|MAXimum]

Arguments
<sn>::=<NR1>
where:
<NR1> is the specified order of harmonic (2 to 16).

<amplitude>::=<NR3>[<units>]
where:
<NR3> is the output amplitude.
<units>::=[mVpp|Vpp]

Returns
<amplitude>

Example
:HARMonic:AMPL 2,2.5
sets the amplitude of the second order of harmonic to 2.5 Vpp.

:HARMonic:AMPL? 2
returns 2.500000E+00.

[SOURce[1|2]]:HARMonic:ORDEr

This command sets or queries the order of the harmonic.

Syntax
[SOURce[1|2]]:HARMonic:ORDEr <value>|MINimum|MAXimum
[SOURce[1|2]]:HARMonic:ORDEr? [MINimum|MAXimum]

Arguments
<value>::=<NR1>
where:
<NR1> is the order of harmonic (2 to 16).

Returns
<value>

Example
:HARMonic:ORDEr 7
sets the order of the harmonic to 7.

[SOURce[1|2]]:HARMonic:PHASe

This command sets or queries the phase of the specified order of harmonic.

Syntax
[SOURce[1|2]]:HARMonic:PHASe <sn>,<phase>|MINimum|MAXimum
[SOURce[1|2]]:HARMonic:PHASe? <sn>[,MINimum|MAXimum]

Arguments
<sn>::=<NR1>
where:
<NR1> is the specified order of harmonic (2 to 16).

<phase>::=<NR3>[<units>]
where:
<NR3> is the phase of the specified order of harmonic.
<units>::=[RAD|DEG]
If <units> are omitted, RAD is specified automatically. The setting ranges are:
RAD: 0 to +2 PI, relative to phase value
DEG: 0 to +360, relative to phase value

Returns
<phase>

Example
:HARMonic:PHASe 2,90
sets the phase of the second order of harmonic to 90°.

[SOURce[1|2]]:HARMonic:TYPe

This command sets or queries the harmonic type (EVEN, ODD, ALL or USER).

Syntax

[SOURce[1|2]]:HARMonic:TYPe EVEN|ODD|ALL|USER
[SOURce[1|2]]:HARMonic:TYPe?

Arguments
EVEN specifies the harmonic type as even.
ODD specifies the harmonic type as odd.
ALL specifies the harmonic type as all.
USER specifies the harmonic type as user.

Returns
EVEN|ODD|ALL|USER

Example
:HARMonic:TYPe ODD
sets the harmonic type to ODD.

[SOURce[1|2]]:MOD:STATe

This command enables or disables the modulation function for the specified channel. The query returns the state of modulation function.

Syntax
[SOURce[1|2]]:MOD:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:MOD:STATe?

Arguments
ON or <NR1>≠0 enables the modulation function.
OFF or <NR1>=0 disables the modulation function.

Returns
<NR1>

Examples
SOURce1:MOD:STATe ON
enables the modulation function for the CH1.

[SOURce[1|2]]:OSKey:INTernal:RATE

This command sets or queries the internal modulation rate of OSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:OSKey:INTernal:RATE {<rate>|MINimum|MAXimum}
[SOURce[1|2]]:OSKey:INTernal:RATE? {MINimum|MAXimum}

Arguments
<rate>::=<NRf>[<units>]
where:
<NRf> is the modulation rate.
<units>::=[Hz|kHz|MHz]

Returns
<rate>

Examples
SOURce1:OSKey:INTernal:RATE 50Hz
sets the CH1 internal OSK modulation rate to 50 Hz.

[SOURce[1|2]]:OSKey:STATe

This command enables or disables OSK modulation. The query returns the state of OSK modulation. The carrier waveform can only be a sine wave.

Syntax
[SOURce[1|2]]:OSKey:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:OSKey:STATe?

Arguments
ON or <NR1>≠0 enables OSK modulation.
OFF or <NR1>=0 disables OSK modulation.

Returns
<NR1>

Examples
SOURce1:OSKey:STATe ON
enables the CH1 OSK modulation.

[SOURce[1|2]]:OSKey:TIME

This command sets or queries the oscillate period for the OSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:OSKey:TIME {<seconds>|MINimum|MAXimum}
[SOURce[1|2]]:OSKey:TIME?

Arguments
<seconds>::=<NRf>[<units>]
where:
<NRf> is the oscillate period in seconds.
<units>::=[ns|us|ms|s]

Returns
<seconds>

Examples
SOURce1:OSKey:TIME 100us
sets the CH1 OSK oscillate period to 100 us.

[SOURce[1|2]]:PHASe[:ADJust]

This command sets or queries the phase of output waveform for the specified channel. Set the value in radians or degrees. If no units are specified, the default is RAD. The query returns the value in RAD.
This command is supported when you select a waveform other than DC and Noise.

Syntax
[SOURce[1|2]]:PHASe[:ADJust] {<phase>|MINimum|MAXimum}
[SOURce[1|2]]:PHASe[:ADJust]? {MINimum|MAXimum}

Arguments
<phase>::=<NR3>[<units>]
where:
<NR3> is the phase of output waveform.
<units>::=[RAD|DEG]
If <units> are omitted, RAD is specified automatically. The setting ranges are:
RAD: 0 to +2 PI, relative to phase value
DEG: 0 to +360, relative to phase value

Returns
<phase>

Examples
SOURce1:PHASe:ADJust MAXimum
sets the maximum value for the phase of CH1 output waveform.

[SOURce[1|2]]:PHASe:INITiate (No Query Form)

This command synchronizes the phase of CH1 and CH2 output waveforms. The arbitrary generator performs the same operation if you specify either SOURce1 or SOURce2.

Syntax
[SOURce[1|2]]:PHASe:INITiate

Arguments
None

Examples
SOURce1:PHASe:INITiate
synchronizes the phase of CH1 and CH2 output signals.

[SOURce[1|2]]:PM[:DEViation]

This command sets or queries the phase deviation of PM modulation for the specified channel.

Syntax
[SOURce[1|2]]:PM[:DEViation] {<deviation>|MINimum|MAXimum}
[SOURce[1|2]]:PM[:DEViation]? [MINimum|MAXimum]

Arguments
<deviation>::=<NR3>[<units>]
where:
<NR3> is the phase deviation.
<units>::=[RAD|DEG]
If <units> are omitted, RAD is specified automatically. The setting ranges are:
RAD: 0 PI to +1 PI, relative to phase value
DEG: 0 to +180, in 1 degree steps, relative to phase value

Returns
<deviation>

Examples
SOURce1:PM:DEViation MAXimum
sets the maximum value for the CH1 phase deviation of PM modulation.

[SOURce[1|2]]:PM:INTernal:FREQuency

This command sets or queries the internal modulation frequency of PM modulation for the specified channel. Use this command when the internal modulation source is selected. Set the internal modulation frequency from 2 mHz to 100.00 kHz with resolution of 1 mHz.

Syntax
[SOURce[1|2]]:PM:INTernal:FREQuency {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:PM:INTernal:FREQuency? [MINimum|MAXimum]

Arguments
<frequency>::=<NRf>[<units>]
where:
<NRf> is the modulation frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:PM:INTernal:FREQuency 10kHz
sets the CH1 internal modulation frequency to 10 kHz.

[SOURce[1|2]]:PM:INTernal:FUNCtion

This command sets or queries the modulating waveform of PM modulation for the specified channel. Use this command when the internal modulation source is selected. If you specify EFILe when there is no EFILe or the EFILe is not yet defined, this command causes an error.

Syntax
[SOURce[1|2]]:PM:INTernal:FUNCtion {SINusoid|SQUare|RAMP|PRNoise

|USER<NR1>|EMEMory|EFILe}
[SOURce[1|2]]:PM:INTernal:FUNCtion?

Arguments
USER<NR1>|EMEMory
<NR1> specifies the user waveform memory location, can be any number from 0 to 15. A user defined waveform saved in the user waveform memory or the EMEMory can be selected as a modulating signal.
EFILe
EFILe is used as a modulating signal.

Returns
SIN|SQU|RAMP|PRN|USER<NR1>|EMEMory|EFILe

Examples
SOURce1:PM:INTernal:FUNCtion SQUare
selects Square as the shape of modulating waveform for the CH1 output.

[SOURce[1|2]]:PM:INTernal:FUNCtion:EFILe

This command sets or queries an EFILe name used as a modulating waveform for PM modulation. A file name must be specified in the mass storage system. This command returns “ ” if there is no file in the mass storage.

Syntax
[SOURce[1|2]]:PM:INTernal:FUNCtion:EFILe <file_name>
[SOURce[1|2]]:PM:INTernal:FUNCtion:EFILe?

Arguments
<file_name>::=<string> specifies a file name in the mass storage system. The <file_name> includes path. Path separators are forward slashes (/).

Returns
<file_name>

Examples
SOURce1:PM:INTernal:FUNCtion:EFILe “TEST”
sets a file named “TEST” in the mass storage.

[SOURce[1|2]]:PM:SOURce

This command sets or queries the source of modulation signal of PM modulation for the specified channel.

Syntax
[SOURce[1|2]]:PM:SOURce [INTernal|EXTernal]
[SOURce[1|2]]:PM:SOURce?

Arguments
INTernal means that the carrier waveform is modulated with an internal source.
EXTernal means that the carrier waveform is modulated with an external source.

Returns
INT|EXT

Examples
SOURce1:PM:SOURce INTernal
sets the CH1 source of modulating signal to internal.

[SOURce[1|2]]:PM:STATe

This command enables or disables PM modulation. The query returns the state of PM modulation. Select a sine, square, ramp, or arbitrary waveform as the carrier waveform.

Syntax
[SOURce[1|2]]:PM:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:PM:STATe?

Arguments
ON or <NR1>≠0 enables PM modulation.
OFF or <NR1>=0 disables PM modulation.

Returns
<NR1>

Examples
SOURce1:PM:STATe ON
enables the CH1 PM modulation.

[SOURce[1|2]]:PSKey[:DEViation]

This command sets or queries the phase deviation of PSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:PSKey[:DEViation] {<deviation>|MINimum|MAXimum}
[SOURce[1|2]]:PSKey[:DEViation]? [MINimum|MAXimum]

Arguments
<deviation>::=<NR3>[<units>]
where:
<NR3> is the phase deviation.
<units>::=[RAD|DEG]
If <units> are omitted, RAD is specified automatically. The setting ranges are:
RAD: 0 PI to +1 PI, relative to phase value
DEG: 0 to +180, in 1 degree steps, relative to phase value

Returns
<deviation>

Examples
SOURce1:PSKey:DEViation MAXimum
sets the maximum value for the CH1 phase deviation of PSK modulation.

[SOURce[1|2]]:PSKey:INTernal:RATE

This command sets or queries the internal modulation rate of PSK modulation for the specified channel. Use this command when the internal modulation source is selected.

Syntax
[SOURce[1|2]]:PSKey:INTernal:RATE {<rate>|MINimum|MAXimum}
[SOURce[1|2]]:PSKey:INTernal:RATE? {MINimum|MAXimum}

Arguments
<rate>::=<NRf>[<units>]
where:
<NRf> is the modulation rate.
<units>::=[Hz|kHz|MHz]

Returns
<rate>

Examples
SOURce1:PSKey:INTernal:RATE 50Hz
sets the CH1 internal modulation rate to 50 Hz.

[SOURce[1|2]]:PSKey:SOURce

This command sets or queries the source of modulation signal of PSK modulation for the specified channel.

Syntax
[SOURce[1|2]]:PSKey:SOURce [INTernal|EXTernal]
[SOURce[1|2]]:PSKey:SOURce?

Arguments
INTernal means that the carrier waveform is modulated with an internal source.
EXTernal means that the carrier waveform is modulated with an external source.

Returns
INT|EXT

Examples
SOURce1:PSKey:SOURce INTernal
sets the CH1 source of modulating signal to internal.

[SOURce[1|2]]:PSKey:STATe

This command enables or disables PSK modulation. The query returns the state of PSK modulation. Select a sine, square, ramp, or arbitrary waveform as the carrier waveform.

Syntax
[SOURce[1|2]]:PSKey:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:PSKey:STATe?

Arguments
ON or <NR1>≠0 enables PSK modulation.
OFF or <NR1>=0 disables PSK modulation.

Returns
<NR1>

Examples
SOURce1:PSKey:STATe ON
enables the CH1 PSK modulation.

[SOURce[1|2]]:PULSe:DCYCle

This command sets or queries the duty cycle of the pulse waveform for the specified channel.
This parameter is related to the pulse width and when any of them is changed, the other will be modified automatically.
The pulse duty cycle is limited by the minimum pulse width and pulse period.
pulse duty cycle ⩾ 100% × minimum pulse width ÷ pulse period
pulse duty cycle ⩽ 100% × (1 - 2 × minimum pulse width ÷ pulse period)

Syntax
[SOURce[1|2]]:PULSe:DCYCle {<percent>|MINimum|MAXimum}
[SOURce[1|2]]:PULSe:DCYCle? [MINimum|MAXimum]

Arguments
<percent>::=<NR2>[<units>]
where:
<NR2> is the duty cycle.
<units>::=PCT

Returns
<percent>

Examples
SOURce1:PULSe:DCYCle 80.5
sets the duty cycle of the pulse waveform on CH1 to 80.5%.

[SOURce[1|2]]:PULSe:TRANsition[:LEADing]

This command sets or queries the leading edge time of pulse waveform.

Syntax
[SOURce[1|2]]:PULSe:TRANsition[:LEADing] {<seconds>|MINimum|MAXimum}

[SOURce[1|2]]:PULSe:TRANsition[:LEADing]?[MINimum|MAXimum]

Arguments
<seconds>::=<NRf>[<units>]
where
<NRf> is the leading edge time of pulse waveform.
<units>::=[ns|us|ms|s]

Returns
<seconds>

Examples
SOURce1:PULSe:TRANsition:LEADing 200ns
sets the CH 1 leading edge time to 200 ns.

[SOURce[1|2]]:PULSe:TRANsition:TRAiling

This command sets or queries the trailing edge time of pulse waveform.

Syntax
[SOURce[1|2]]:PULSe:TRANsition:TRAiling {<seconds>|MINimum|MAXimum}
[SOURce[1|2]]:PULSe:TRANsition:TRAiling?[MINimum|MAXimum]

Arguments
<seconds>::=<NRf>[<units>]
where
<NRf> is the trailing edge of pulse waveform.
<units>::=[ns|us|ms|s]

Returns
<seconds>

Examples
SOURce1:PULSe:TRANsition:TRAiling 200ns
sets the trailing edge time to 200 ns.

[SOURce[1|2]]:PULSe:WIDTh

This command sets or queries the pulse width for the specified channel.

Syntax
[SOURce[1|2]]:PULSe:WIDTh {<seconds>|MINimum|MAXimum}
[SOURce[1|2]]:PULSe:WIDTh?[MINimum|MAXimum]

Arguments
<seconds>::=<NRf>[<units>]
where
<NRf> is the pulse width.
<units>::=[ns|us|ms|s]

Returns
<seconds>

Examples
SOURce1:PULSe:WIDTh 200ns
sets the CH 1 pulse width to 200 ns.

[SOURce[1|2]]:PWM:INTernal:FREQuency

This command sets or queries the internal modulation frequency of PWM modulation for the specified channel. Use this command when the internal modulation source is selected. Set the internal modulation frequency from 2 mHz to 100.00 kHz with resolution of 1 mHz. Select the source of modulating signal by using the [SOURce[1|2]]:PWM:SOURce [INTernal|EXTernal] command.

Syntax
[SOURce[1|2]]:PWM:INTernal:FREQuency {<frequency>|MINimum|MAXimum}
[SOURce[1|2]]:PWM:INTernal:FREQuency?

Arguments
<frequency>::=<NRf>[<units>]
where <NRf> is the modulation frequency.
<units>::=[Hz|kHz|MHz]

Returns
<frequency>

Examples
SOURce1:PWM:INTernal:FREQuency 10kHz
sets the CH1 internal modulation frequency of PWM modulation to 10 kHz.

[SOURce[1|2]]:PWM:INTernal:FUNCtion

This command sets or queries the modulating waveform of PWM modulation for the specified channel. Use this command when the internal modulation source is selected. If you specify EFILe when there is no EFILe or the EFILe is not yet defined, this command causes an error.

Syntax

[SOURce[1|2]]:PWM:INTernal:FUNCtion {SINusoid|SQUare|RAMP|PRNoise |USER<NR1>|EMEMory|EFILe}
[SOURce[1|2]]:PWM:INTernal:FUNCtion?

Arguments

SINusoid|SQUare|RAMP|PRNoise
One of four types of function waveform can be selected as a modulating signal.

USER<NR1>|EMEMory
<NR1> specifies the user waveform memory location, can be any number from 0 to 31. A user defined waveform saved in the user waveform memory or the EMEMory can be selected as a modulating signal.

EFILe
EFILe is used as a modulating signal.

Returns

SIN|SQU|RAMP|PRN|USER<NR1>|EMEMory|EFILe

Examples

SOURce1:PWM:INTernal:FUNCtion SQUare
selects Square as the shape of modulating waveform of PWM modulation for the CH1 output.

[SOURce[1|2]]:PWM:INTernal:FUNCtion:EFILe

This command sets or queries an EFILe name used as a modulating waveform for PWM modulation. A file name must be specified in the mass storage system. This command returns “ ” if there is no file in the mass storage.

Syntax

[SOURce[1|2]]:PWM:INTernal:FUNCtion:EFILe <file_name>
[SOURce[1|2]]:PWM:INTernal:FUNCtion:EFILe?

Arguments
<file_name>::=<string> specifies a file name in the mass storage system. The <file_name> includes path. Path separators are forward slashes (/).

Returns
<file_name>

Examples
SOURce1:PWM:INTernal:FUNCtion:EFILe “TEST”
creates a file named “TEST” in the mass storage.

[SOURce[1|2]]:PWM:SOURce

This command sets or queries the source of modulating signal of PWM modulation for the specified channel.

Syntax
[SOURce[1|2]]:PWM:SOURce [INTernal|EXTernal]
[SOURce[1|2]]:PWM:SOURce?

Arguments
INTernal means that the carrier waveform is modulated with the internal source.
EXTernal means that the carrier waveform is modulated with an external source.

Returns
INT|EXT

Examples
SOURce1:PWM:SOURce INTernal
sets the source of modulating signal on CH1 to internal.

[SOURce[1|2]]:PWM:STATe

This command enables or disables PWM modulation. The query returns the state of PWM modulation. Select only pulse waveform as a carrier waveform for PWM.

Syntax
[SOURce[1|2]]:PWM:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:PWM:STATe?

Arguments
ON or <NR1>≠0 enables PWM modulation.
OFF or <NR1>=0 disables PWM modulation.

Returns
<NR1>

Examples
SOURce1:PWM:STATe ON
enables the CH1 PWM modulation.

[SOURce[1|2]]:PWM[:DEViation]:DCYCle

This command sets or queries the PWM deviation in percent for the specified channel.

Syntax
[SOURce[1|2]]:PWM[:DEViation]:DCYCle {<percent>|MINimum|MAXimum}
[SOURce[1|2]]:PWM[:DEViation]:DCYCle?

Arguments
<percent>::=<NR2>[<units>]
where:
<NR2> is the PWM deviation.
<units>::=PCT

Returns
<percent>

Examples
SOURce1:PWM:DEViation:DCYCle 5.0
sets the CH1 PWM deviation to 5.0%.

[SOURce[1|2]]:SWEep:SOURce

This command sets or queries the trigger source in the sweep mode for the specified channel.

Syntax
[SOURce[1|2]]:SWEep:SOURce [TIMer|MANual|EXTernal]

[SOURce[1|2]]:SWEep:SOURce?

Arguments
TIMer specifies an internal clock as the trigger source.
MANual specifies a manual trigger input as the trigger source.
EXTernal specifies an external trigger input as the trigger source.

Returns
TIM|MAN|EXT

Examples
SOURce1:SWEep:SOURce EXTernal
sets an external trigger input as the trigger source in the sweep mode.

[SOURce[1|2]]:SWEep:SPACing

This command selects linear or logarithmic spacing for the sweep for the specified channel.
The query returns the type for the sweep spacing for the specified channel.

Syntax
[SOURce[1|2]]:SWEep:SPACing {LINear|LOGarithmic}
[SOURce[1|2]]:SWEep:SPACing?

Arguments
LINear sets the sweep spacing to linear.
LOGarithmic sets the sweep spacing to logarithmic.

Returns
LIN|LOG

Examples
SOURce1:SWEep:SPACing LINear
sets the CH1 sweep spacing to linear.

[SOURce[1|2]]:SWEep:STATe

This command enables or disables the sweep mode for the specified channel. The query returns the state of sweep mode.

Syntax
[SOURce[1|2]]:SWEep:STATe {ON|OFF|<NR1>}
[SOURce[1|2]]:SWEep:STATe?

Arguments
ON or <NR1>≠0 enables the sweep mode.
OFF or <NR1>=0 disables the sweep mode.

Returns
<NR1>

Examples
SOURce1:SWEep:STATe ON
enables the sweep mode for the CH1.

[SOURce[1|2]]:SWEep:TIME

This command sets or queries the sweep time for the sweep for the specified channel. The sweep time does not include hold time and return time. The setting range is 1 ms to 500 s.

Syntax
[SOURce[1|2]]:SWEep:TIME {<seconds>|MINimum|MAXimum}
[SOURce[1|2]]:SWEep:TIME?

Arguments
<seconds>::=<NRf>[<units>]
where:
<NRf> is the sweep time in seconds.
<units>::=[ns|us|ms|s]

Returns
<seconds>

Examples
SOURce1:SWEep:TIME 100ms
sets the CH1 sweep time to 100 ms.

[SOURce[1|2]]:VOLTage[:LEVel][:IMMediate]:OFFSet

This command sets or queries the offset level for the specified channel.

Syntax
[SOURce[1|2]]:VOLTage[:LEVel][:IMMediate]:OFFSet {<voltage>|MINimum|MAXimum}
[SOURce[1|2]]:VOLTage[:LEVel][:IMMediate]:OFFSet? {MINimum|MAXimum}

Arguments
<voltage>::=<NR3>[<units>]
where:
<NR3> is the offset voltage level.
<units>::=[mV|V]

Returns
<voltage>

Examples
SOURce1:VOLTage:LEVel:IMMediate:OFFSet 500mV
sets the CH1 offset level to 500 mV.

[SOURce[1|2]]:VOLTage[:LEVel][:IMMediate][:AMPLitude]

This command sets or queries the output amplitude for the specified channel. The amplitude resolution is 1 mVpp or four digits.

Syntax
[SOURce[1|2]]:VOLTage[:LEVel][:IMMediate][:AMPLitude]
{<amplitude>|MINimum|MAXimum}
[SOURce[1|2]]:VOLTage[:LEVel][:IMMediate][:AMPLitude]? {MINimum|MAXimum}

Arguments
<amplitude>::=<NR3>[<units>]
where:
<NR3> is the output amplitude.
<units>::=[mVpp|Vpp]

Returns
<amplitude>

Examples
SOURce1:VOLTage:LEVel:IMMediate:AMPLitude 1Vpp
sets the CH1 output amplitude to 1 Vpp.

SYSTem:BEEPer[:IMMediate] (No Query Form)

This command causes the instrument to beep immediately. This command is only available when the beeper is enabled.

Syntax
SYSTem:BEEPer[:IMMediate]

Arguments
None

Examples
SYSTEM:BEEPER
causes a beep.

SYSTem:BEEPer:STATe

The SYSTem:BEEPer:STATe command sets the beeper ON or OFF.
The SYSTem:BEEPer:STATe? command returns “0” (OFF) or “1” (ON).
When the beeper is set to ON, the instrument will beep when an error message or a warning message is displayed on the screen. The instrument does not beep when an error or warning caused by remote command execution.

Syntax
SYSTem:BEEPer:STATe {ON|OFF|<NR1>}
SYSTem:BEEPer:STATe?

Arguments
ON or <NR1>≠0 enables the beeper.
OFF or <NR1>=0 disables the beeper.

Returns
<NR1>

Examples
SYSTEM:BEEPER:STATE ON

enables the beeper function.

SYSTem:ERRor[:NEXT]? (Query Only)

This query-only command returns the contents of the Error/Event queue.

Syntax
SYSTem:ERRor[:NEXT]?

Arguments
None

Returns
<Error/event number>::=<NR1>
<Error/event description>::=<string>

Examples
SYSTEM:ERROR:NEXT?
might return the following response:
-201,"Invalid while in local"
If the instrument detects an error or an event occurs, the event number and event message will be returned.

SYSTem:KLOCk[:STATe]

This command locks or unlocks the instrument front panel controls. The query command returns “0” (OFF) or “1” (ON).

Syntax
SYSTem:KLOCk[:STATe] {ON|OFF|<NR1>}
SYSTem:KLOCk[:STATe]?

Arguments
ON or <NR1>≠0 locks front panel controls.
OFF or <NR1>=0 unlocks front panel controls.

Returns
<NR1>

Examples

SYSTEM:KLOCK ON
locks front panel controls.

SYSTem:LANguage

This command sets or queries the language that the instrument uses to display information on the screen.
Different languages may support different types of languages.

Syntax
SYSTem:LANguage
{SCHinese|TCHinese|ENGLish|PORTuguese|GERMan|POLish|KORean|JAPAnese}
SYSTem:LANguage?

Arguments
SCHinese|TCHinese|ENGLish|PORTuguese|GERMan|POLish|KORean|JAPAnese
specifies which language will be used to display instrument information on the screen.

Returns
SCH|TCH|ENGL|PORT|GERM|POL|KOR|JAPA

Examples
SYSTEM:LANGUAGE ENGLish
specifies that the instrument displays information in English.

SYSTem:POWeron

Set the configuration to be used by the instrument at power-on to DEFault or LASt.
Query the configuration to be used by the instrument at power-on.

Syntax
SYSTem:POWeron [DEFault|LASt]
SYSTem:POWeron?

Arguments
DEFault means that set the configuration to be used by the instrument at power-on to default setup.
LASt means that set the configuration to be used by the instrument at power-on to last setup.

Returns
DEF|LAS

Examples
SYSTem:POWeron LASt
sets the configuration to be used by the instrument at power-on to LASt.

SYSTem:POWeron?
returns LAS.

SYSTem:RESTART

This command restarts the instrument.

Syntax
SYSTem:RESTART

Arguments
None

Examples
SYSTem:RESTART
restarts the instrument.

SYSTem:VERSion? (Query Only)

This query-only command returns the software version of the instrument.

Syntax
SYSTem:VERSion?

Arguments
None

Returns
<Software Version>::=Vx.x.x
where:
x – indicates the version number.

Examples

SYSTEM:VERSION?
might return V1.2.4.

TRACe|DATA:CATalog? (Query Only)

This query-only command returns the names of user waveform memory and edit memory.

Syntax
TRACe|DATA:CATalog?

Arguments
None

Returns
<string>
A series of strings separated by commas is returned. Each string is enclosed within quotation marks.

Examples
DATA:CATALOG?
might return “USER0”,”USER2”,”EMEM”

TRACe|DATA:COPY (No Query Form)

This command copies the contents of edit memory (or user waveform memory) to a specified user waveform memory (or edit memory).

Syntax
TRACe|DATA:COPY <trace_name>,EMEMory
TRACe|DATA:COPY EMEMory,{USER<NR1>}

Arguments
<trace_name>::={USER<NR1>}
<NR1> specifies the user waveform memory location, can be any number from 0 to 31.

Examples
DATA:COPY USER0,EMEMory
copies the waveform data in the edit memory to the user waveform memory USER0.
DATA:COPY EMEMory,USER0
copies the waveform data in the user waveform memory USER0 to the edit memory.

TRACe|DATA[:DATA]

This command transfers the waveform data from the external controller to the edit memory in the instrument. The query returns the binary block data.

Syntax
TRACe|DATA[:DATA] EMEMory,<binary_block_data>
TRACe|DATA[:DATA]? EMEMory

Arguments
<binary_block_data>
where <binary_block_data> is the waveform data in binary format.

Returns
<binary_block_data>

Examples
DATA:DATA EMEMory,#42000<DAB><DAB>...<DAB>
transmits a waveform to the edit memory in the instrument. The block data element #21000 indicates that 2 is the number of digits in 1000 (byte count) and the 1000 bytes of binary data are to be transmitted.

TRACe|DATA[:DATA]:VALue

This command sets or queries the data value at the specified point in the edit memory.

Syntax
TRACe|DATA[:DATA]:VALue EMEMory,<point>,<data>
TRACe|DATA[:DATA]:VALue? EMEMory,<point>

Arguments
<point>::=<NR1>
where:
<NR1> is the specified point number in the edit memory.

<data>::=<NRf>
where:
<NRf> is the voltage value for the specified point number.
<units>::=[mV|V]

Returns
<NRf>

Examples
DATA:DATA:VALue EMEMory,200,1.5V
sets the voltage value to 1.5V for the point number 200 in the edit memory.

DATA:DATA:VALue? EMEMory,200
might return “1.5000000+e0”.
This example indicates that the voltage value of point number 200 is set to 1.5V.

TRACe|DATA:POINts

This command sets or queries the number of data points for the waveform created in the edit memory.

Syntax
TRACe|DATA:POINts EMEMory[,<points>|MINimum|MAXimum]
TRACe|DATA:POINts? EMEMory{,MIN|MAX}

Arguments
<points>::=<NR1>
where
<NR1> sets the number of points for the waveform created in the edit memory, can be any number from 2 to 100,000.

Returns
<NR1>

Examples
DATA:POINts EMEMory, 500
sets the waveform data points to 500 in the edit memory.

*TRG (No Query Form)

This command generates a trigger event for both CH1 and CH2.

Syntax
*TRG

Arguments

None

Examples

*TRG

generates a trigger event for both CH1 and CH2.

3. Command Errors

The following table shows the error messages generated by improper command syntax. Check that the command is properly formed and that it follows the rules in the Syntax and Commands.

Command messages

Code	Message
0 (indicates no error)	
-101	Invalid character
-102	Syntax error
-108	Parameter not allowed
-201	Invalid while in local

Error/Event Queue

The event queue is an FIFO queue, which stores events as they occur in the instrument. The event queue can store up to 64 events.

The oldest error code and text are retrieved by using the following command:

SYSTem:ERRor[:NEXT]?

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