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Introduction to the SCPI Language

Syntax

SCPI commands present a hierarchical tree structure and contain multiple sub-systems, each of which is made up of a root keyword and one or more sub-keywords. The command string usually starts with ":", 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".

For example,
:TRIGger:SINGle:EDGE:SOURce <source>
:TRIGger:SINGle:EDGE:SOURce?

TRIGger is the root keyword of the command. **SINGle**, **EDGE** and **SOURce** are the second-level, third-level and fourth-level keywords respectively. The command string starts with "**:**" which separates the multiple-level keywords. **<source>** represents parameters available for setting, "**?**" represents query and the command **:**
TRIGger:SINGle:EDGE:SOURce and the parameter **<source>** are separated by "space".

Syntax Rules

SCPI language itself defines a group of sub-system keywords, and at the same time allows users to add or reduce keywords. Those keywords can be some meaningful English words and are easy to remember, which are called mnemonics. Mnemonic has long and short types. The short are the abbreviation of the long.

- **Rule to format mnemonics:**

1) If the letter number of an English word is less than or equal to 4, then the word itself can be the mnemonic.(such as "Free" can be "FREE")
2) If the letter number of an English word exceeds 4, then the first four letters will be the mnemonic.(such as "Frequency" can be "FREQ")
3) If the forth letter is vowel, then mnemonic uses the former three letters. Vowels consist of a, e, i, o, and u.(such as "Power" can be "POW")
4) If it is not a word but a sentence, then use the first letters of the former words and the whole of the last word. (such as "Input Voltage" can be "IVOLtage")

- **Usage of symbols**

1) Space

The space is used to separate command and parameter.

2) Colon :

If the colon is in front of the first character, it means the following is Root Command. When the colon is set between two keywords, then it means moving from the current level to the next level.

3) *asterisk

The commands start with asterisk are named Common Command, which is used to execute IEEE488.2 common commands.

4) Braces {}

The parameters enclosed in the braces are optional and are usually separated by the vertical bar "|". When using this command, one of the parameters must be selected.

5) Vertical Bar |

The vertical bar is used to separate multiple parameters and one of the parameters must be selected when using the command.

6) Triangle Brackets < >

The parameter enclosed in the triangle brackets must be replaced by an effective value.

- **Parameter Type**

1) **Discrete**

The parameter should be one of the values listed. For example,
:TRIGger:SINGle:EDGE:SOURce <source>
:TRIGger:SINGle:EDGe:SOURce?
wherein,
<source> can be set to CH1|CH2
The query returns the abbreviated format: "CH1", "CH2".

2) **Integer**

Unless otherwise noted, the parameter can be any integer (NR1 format) within the effective value range. Note that, do not set the parameter to a decimal, otherwise errors will occur. For example,
:CH<n>:OFFSet <offset>
:CH<n>:OFFSet?
wherein,
<n> can be set to 1 or 2, represents CH1 or CH2.
<offset> can be set to any integer between -2000 and 2000.
The query returns any integer between -2000 and 2000.

3) **Bool**

The parameter could be "OFF", "ON". For example,
:CH1:DISPlay <bool>
:CH1:DISPlay?
wherein,
<bool> can be set to {OFF|ON}
The query returns "OFF" or "ON".

Command Abbreviation

Each SCPI command can be written mixed with uppercase and lowercase according to the syntax rules, and the capital letter part is just the abbreviation of the command. If abbreviation is used, all the capital letters in the command must be written completely. For parameters with units, please refer to the detail parameter specifications in the sub-system.

Example 1：
:ACQuire:MODE SAMPle
Abbreviation Below：
:ACQ:MODE SAMP

Example 2：
:CH1:SCALe 1v
Abbreviation Below：
:CH1:SCAL 1v

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Third-party API

The SCPI protocol of this instrument is based on USB port and LAN communication.
Run the oscilloscope software; click "**Communications**" in the menu bar, choose "**Command Line**". In the SCPI COMMAND LINE dialog, you can send SCPI commands to communicate through SCPI protocol.

IEEE488.2 Common Commands

*CLS

Description

Clear all the event registers in the register set and clear the error queue.

*ESE

Description

Set enable register for the standard event register set.

Parameter

Name	Type	Range	Default Value
<value>	Integer	0 to 255	0

Explanation

The bit 1 and bit 6 of the standard event register are not used and are always treated as 0, therefore, the range of <value> are the decimal numbers corresponding to the binary numbers ranging from 00000000 (0 in decimal) to 11111111 (255 in decimal) and of which the bit 1 and bit 6 are 0.

Definitions of the Bits in ESE Register:

Bit	weights	Name	Enable
7	128	PON	Power On
6 (Not used)	64	URQ	User Request
5	32	CME	Command Error
4	16	EXE	Execution Error
3	8	DDE	Dev. Dependent Error
2	4	QYE	Query Error
1 (Not used)	2	RQL	Request Control
0	1	OPC	Operation Complete

Return Format

The query returns an integer which equals to the sum of the weights of all the bits that have already been set in the register. For example, the query returns "144" if bit 4 (16 in decimal) and 7 (128 in decimal) are enabled.

Example

The command below enables bit 4 (16 in decimal) of the enable register.
*ESE 16
The query below returns "16".
*ESE?

*ESE?

Description
Query which bit in ESE register is enabled.

Example
The command below enables bit 4 (16 in decimal) of the enable register.
*ESE 16
The query below returns "16".
*ESE?

*ESR?

Description
Query the event register for the standard event register set.

Parameter

Name	Type	Range	Default Value
<value>	Integer	0 to 255	0

Explanation
The bit 1 and bit 6 of the standard event register are not used and are always treated as 0, therefore, the query returns the decimal numbers corresponding to the binary numbers ranging from 00000000 (0 in decimal) to 11111111 (255 in decimal) and of which the bit 1 and bit 6 are 0.
Definitions of the Bits in ESE Register:

Bit	weights	Name	Enable
7	128	PON	Power On
6 (Not used)	64	URQ	User Request
5	32	CME	Command Error
4	16	EXE	Execution Error
3	8	DDE	Dev. Dependent Error
2	4	QYE	Query Error
1 (Not used)	2	RQL	Request Control
0	1	OPC	Operation Complete

Return Format

The query returns an integer which equals to the sum of the weights of all the bits that have already been set in the register. For example, the query returns "144" if bit 4 (16 in decimal) and 7 (128 in decimal) are enabled.

Example

The query below returns "24" (bit 3 and bit 4 have already been set).

*ESR?

*IDN?

Description

The query returns the ID character string of the instrument.

Return Format

Factory,<model>,<serial number>,X.XX.XX

<model>：the model number of the instrument.

<serial number>：the serial number of the instrument.

X.XX.XX：the software version of the instrument.

Example

Factory,XDS3102A,1528009,V2.1.1.5

*OPC

Description

Set the "Operation Complete" bit in the standard event register to 1 after the current operation is finished.

*OPC?

Description

Query whether the current operation is finished.

Explanation

Note the difference between the *OPC? and *OPC commands: the latter sets the "Operation Complete" bit (bit 0) in the standard event register to 1 after the current operation is finished.

Return Format

The query returns "1" if the current operation is finished, otherwise returns "0".

*RST

Description

Restore the instrument to its default value.

*SRE

Description

Set enable register for the state byte register set.

Parameter

Name	Type	Range	Default Value
<value>	Integer	0 to 255	0

Explanation

The bit 0 and bit 1 of the state byte register are not used and are always treated as 0, therefore, the range of <value> are the decimal numbers corresponding to the binary numbers ranging from 00000000 (0 in decimal) to 11111111 (255 in decimal) and of which the bit 0 and bit 1 are 0.

Definitions of the Bits in SRE:

Bit	Weights	Name	Enable
7	128	OPER	Operation Status Reg
6	64	---	Not used
5	32	ESB	Event Status Bit
4	16	MAV	Message Available
3	8	---	Not used
2	4	MSG	Message
1 (Not used)	2	USR	User
0 (Not used)	1	TRG	Trigger

Return Format

The query returns an integer which equals to the sum of the weights of all the bits that have already been set in the register. For example, the query returns "144" if bit 4 (16 in decimal) and 7 (128 in decimal) are enabled.

Example

The command below enables bit 4 (16 in decimal) of the enable register.

*SRE 16
The query below returns "16".
*SRE?

*STB?

Description
Query the condition register for the state byte register set.

*TST?

Description
Perform self-test and return the test result.
If the returned bit is "0", the corresponding item of the instrument passed this test, while "1" indicates a failure.

*WAI

Description
Wait for the finish of the operation.

Oscilloscope SCPI commands

:ACQuire Command Subsystem

:ACQuire:MODE

Syntax

:ACQuire:MODE <type>

:ACQuire:MODE?

Description

Set the acquisition mode of the oscilloscope.

Parameter

Name	Type	Range	Default Value
<type>	Discrete	{SAMPle|AVERage|PEAK}	SAMP

Explanation

When "AVERage" is selected, use the :ACQuire:AVERage:NUM command to set the number of averages.

Return format

The query returns "SAMPle", "AVERage" or "PEAK".

Example

The command below selects the average acquisition mode.

:ACQuire:MODE AVERage

The query below returns "AVERage".

:ACQuire:MODE?

:ACQuire:AVERage:NUM <count>

Syntax

:ACQuire:AVERage:NUM <count>

:ACQuire:AVERage:NUM?

Description

Set the number of averages.

Parameter

Name	Type	Range	Default Value
<count>	Discrete	{4|16|64|128}	4

Explanation

At present, the number of averages can be set is "4", "16", "64" and "128". When executing :ACQuire:AVERage:NUM <count> , the acquisition mode of the oscilloscope would be changed to AVERage mode automatically.

Return format

The query returns the number of average in character string.

Example

The command below sets the number of averages to "64".

:ACQuire:AVERage:NUM 64

The query below returns "64"：

:ACQuire:AVERage:NUM?

:HORIzontal Command Subsystem

:HORIzontal:SCALe

Syntax

:HORIzontal:SCALe <scale_value>

:HORIzontal:SCALe?

Description

Set the scale of the main time base.

Parameter

Name	Type	Range	Default Value
<scale_value>	Discrete	{2.0ns|5.0ns|10.0ns|20.0ns|50.0ns|100ns|200ns|500ns|1.0us|2.0us|5.0us|10us|20us|50us|100us|200us|500us|1.0ms|2.0ms|5.0ms|10ms|20ms|50ms|100ms|200ms|500ms|1.0s|2.0s|5.0s|10s|20s|50s|100s|200s|500s|1000s}	----

Return Format

The query returns the horizontal scale in character string.

Example

The command below sets the horizontal scale of channel 1 to 200us/div.

:HORIzontal:SCALe 200us
The query below returns "200us".
:HORIzontal:SCALe?

:HORIzontal:OFFset

Syntax
:HORIzontal:OFFset <value>
:HORIzontal:OFFset?

Description
Set the Horizontal offset of the time base.

Parameter

Name	Type	Range	Default Value
<value>	Integer	-10 to +10000(horizontal offset div)	0

Return Format
The query returns the offset in character string.

Explanation
If the current main time base is 500 us/div, and the horizontal offset is 2 div, then the horizontal offset time is 1.000 ms.

Example
The command below sets the horizontal offset of channel1 to 1 div.
:HORIzontal:OFFset 1

The query returns horizontal offset div.
If the current main time base is 500 us/div, and the horizontal offset time is 1.000 ms, the query below returns "2".
:HORIzontal:OFFset?

:CH Command Subsystem

:CH<n>:DISPlay

Syntax
:CH<n>:DISPlay <bool>
:CH<n>:DISPlay?

Description

Turn the display of the channel on or off.

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2}	1
<bool>	Bool	{OFF|ON}	OFF

Return Format

The query returns "OFF" or "ON".

Example

The command below turns the display of channel1 on.

:CH1:DISPlay ON

The query returns "ON".

:CH1:DISPlay?

:CH<n>:COUPling

Syntax

:CH<n>:COUPling <coupling>

:CH<n>:COUPling?

Description

Set the coupling mode of the channel to "AC", "DC" or "GND".

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2}	1
<coupling>	Discrete	{AC|DC|GND}	DC

Return Format

The query returns "AC", "DC" or "GND".

Example

The command below sets the input coupling mode of channel 1 to "DC".

:CH1:COUPling DC

The query returns "DC".

:CH1:COUPling?

:CH<n>:PROBe

Syntax

:CH<n>:PROBe <atten>

:CH<n>:PROBe?

Description

Set the attenuation ratio of the probe.

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2}	1
<atten>	Discrete	{1X|10X|100X|1000X}	10X

Return Format

The query returns the attenuation ratio of the probe.

Example

The command below sets the attenuation ratio of the probe connected to channel1 to 10.

:CH1:PROBe 10X

The query returns "10X".

:CH1:PROBe?

:CH<n>:SCALe

Syntax

:CH<n>:SCALe <scale>

:CH<n>:SCALe?

Description

Set the vertical scale of the specified waveform display.

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2}	1
<scale>	Discrete	2mV-10V	----

Explanation

The attenuation ratio of the probe should be considered when setting the parameter. E.g., the attenuation ratio of the probe is 10X, if you want to set the vertical scale as 10 mv, the command is :CH<n>:SCALe 1mv.

Return Format

The query returns the vertical scale in character string.

Example

The command below sets the vertical scale of channel 1 to 1V/div.

:CH1:SCALe 1v

The query returns "1v".

:CH1:SCALe?

:CH<n>:OFFSet

Syntax

:CH<n>:OFFSet <offset>

:CH<n>:OFFSet?

Description

Set the vertical offset of the specified waveform display.

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2}	1
<offset>	Integer	-2000 to 2000	0

Return Format

The query returns the offset div value in Integer.

Example

The command below sets the vertical offset of channel 1 to 1 div.

:CH1:OFFSet 1

The query below returns 1.

:CH1:OFFSet?

:CH<n>:INVErse

Syntax

:CH<n>:INVErse <bool>

:CH<n>:INVErse?

Description

Turn the inverse of the channel on or off.

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2}	1
<bool>	Bool	{OFF|ON}	OFF

Return Format

The query returns "OFF" or "ON".

Example

The command below turns the inverse of channel1 on.

:CH1:INVErse ON

The query returns "ON".

:CH1:INVErse?

:MEASurement Command Subsystem

:MEASurement:DISPlay

Syntax

:MEASurement:DISPlay <bool>

:MEASurement:DISPlay?

Description

Turn the display of measurement on or off.

Parameter

Name	Type	Range	Default Value
<bool>	Bool	{OFF|ON}	OFF

Return Format

The query returns "ON" or "OFF".

Example

The command below turns the display of measurement on.

:MEASurement:DISPlay ON

The query returns "ON".

:MEASurement:DISPlay?

:MEASurement:CH<n>:<items>

Syntax

:MEASurement:CH<n>:<items>?

Description

Query the specified measurement value of the specified channel.

Remarks: For the measurements need two sources, refer to the command :MEASUrement:<items>? <cha>,<chb>.

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2}	1
<items>	Discrete	{MAX|MIN|PKPK|VTOP|VBASe|VAMP|AVERage|SQUAresum|CYCRms|CURSorrms|OVERShoot|PREShoot|PERiod|FREQuency|RTime|FTime|PWIDth|NWIDth|PDUTy|NDUTy|SCREenduty|PPULsenum|NPULsenum|RISEedgenum|FALLedgenum|AREA|CYCLearea|HARDfrequency}	--

Explanation for <items>

Amplitude Measurements	
Items	**Explanation**
MAX	Maximum
MIN	Minimum
PKPK	Peak-to-peak
VTOP	Top
VBASe	Base
VAMP	Amplitude
AVERage	Average
SQUAresum	RMS
CYCRms	Cycle RMS
CURSorrms	Cursor RMS
OVERShoot	Overshoot
PREShoot	Preshoot

Time Measurements	
Items	**Explanation**
PERiod	Period
FREQuency	Frequency
RTime	Rise time
FTime	Fall time
PWIDth	Positive pulse width
NWIDth	Negative pulse width
PDUTy	Positive duty cycle
NDUTy	Negative duty cycle
SCREenduty	Screen duty

Count Measurements	
Items	**Explanation**
PPULsenum	Positive pulse count
NPULsenum	Negative pulse count

Other Measurements	
Items	**Explanation**
AREA	Area
CYCLearea	Cycle area

RISEedgenum	Rising edge count
FALLedgenum	Falling edge count

HARDfrequency	Hardware frequency counter

Example

The query below returns the frequency measurement value of CH1.

:MEASurement:CH1:PERiod?

:MEASurement:<items>? <cha>,<chb>

Syntax

:MEASurement:<items>? <cha>,<chb>

Description

Query the specified measurement value need two sources.

Parameter

Name	Type	Range	Default Value
<items>	Discrete	{FRR|FRF|FFR|FFF|LRR|LRF|LFR|LFF|RDELay|FDELay|RPHase|FPHase}	--
<cha>	Discrete	{CH1|CH2}	--
<chb>	Discrete	{CH1|CH2}	--

Explanation for <items>

Delay and Phase Measurements	
Items	**Explanation**
FRR	Time between the first rising edge of CH1 and the first rising edge of CH2
FRF	Time between the first rising edge of CH1 and the first falling edge of CH2
FFR	Time between the first falling edge of CH1 and the first rising edge of CH2
FFF	Time between the first falling edge of CH1 and the first falling edge of CH2
LRR	Time between the first rising edge of CH1 and the last rising edge of CH2
LRF	Time between the first rising edge of CH1 and the last falling edge of CH2
LFR	Time between the first falling edge of CH1 and the last rising edge of CH2
LFF	Time between the first falling edge of CH1 and the last falling edge of CH2
RDELay	Delay of A→B 卐
FDELay	Delay of A→B 卍
RPHAse	Phase of A→B 卐
FPHase	Phase of A→B 卍

Example

The query below returns the delay of CH1→CH2 rising edge.

:MEASurement:RDELay? CH1,CH2

:MEASurement:CH<n>

Syntax

:MEASurement:CH<n>?

Description

Query the all the measurement values of the selected waveform (JSON format).

Remarks: The measurements need two sources will not be returned (FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, RDELay, FDELay, RPHase, and FPHase).

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2}	1

Example

The query below returns all the measurement values of CH1.

:MEASurement:CH1?

:MEASurement:ALL

Syntax

:MEASurement:ALL?

Description

Query the all the measurement values of CH1, CH2.

Remarks: The measurements need two sources will not be returned (FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, RDELay, FDELay, RPHase, and FPHase).

:TRIGger Command Subsystem

:TRIGger:STATus?

Syntax

:TRIGger:STATus?

Description

Query the current trigger status.

Parameter

Type	Range	Default Value
Discrete	{AUTO|READy|TRIG|SCAN|STOP}	--

Return Format

The query returns the current trigger status.

Example

The query below returns "AUTO".

:TRIGger:STATus?

:TRIGger:TYPE <type>

Syntax

:TRIGger:TYPE <type>

:TRIGger:TYPE?

Description

Select the trigger type.

Parameter

Name	Type	Range	Default Value
<type>	Discrete	{SINGle|ALT }	SING

Return Format

The query returns the current trigger type.

Example

The command below selects single trigger.

:TRIGger:TYPE SINGle

The query below returns "SINGle".

:TRIGger:TYPE?

:TRIGger:SINGle

:TRIGger:SINGle:MODE <type>

Syntax

:TRIGger:SINGle:MODE <type>

:TRIGger:SINGle:MODE?

Description

Select the trigger mode of single trigger.

Parameter

Name	Type	Range	Default Value
<type>	Discrete	{EDGE|VIDEo }	EDGE

Return Format

The query returns the current trigger mode of single trigger.

Example

The command below selects edge as trigger mode.

:TRIGger:SINGle:MODE EDGE

The query below returns "EDGE".

:TRIGger:SINGle:MODE?

:TRIGger:SINGle:EDGE

:TRIGger:SINGle:EDGE:SOURce

Syntax

:TRIGger:SINGle:EDGE:SOURce <source>

:TRIGger:SINGle:EDGE:SOURce?

Description

Select the source of SINGle EDGE trigger.

Parameter

Name	Type	Range	Default Value
<source>	Discrete	{CH1|CH2}	CH1

Return Format

The query returns "CH1", "CH2".

Example

The command below selects "CH2" as the source of SINGle EDGE trigger.

:TRIGger:SINGle:EDGE:SOURce CH2

The query below returns "CH2".

:TRIGger:SINGle:EDGE:SOURce?

:TRIGger:SINGle:EDGE:COUPling

Syntax

:TRIGger:SINGle:EDGE:COUPling <coupling>

:TRIGger:SINGle:EDGE:COUPling?

Description

Select the coupling mode under SINGle EDGE trigger.

Parameter

Name	Type	Range	Default Value
<coupling>	Discrete	{DC|AC}	DC

Return Format

The query returns "DC", "AC".

Example

The command below selects "AC" as the coupling mode of SINGle EDGE trigger.

:TRIGger:SINGle:EDGE:COUPling AC

The query below returns "AC".

:TRIGger:SINGle:EDGE:COUPling?

:TRIGger:SINGle:EDGE:LEVEl

Syntax

:TRIGger:SINGle:EDGE:LEVEl <level>

:TRIGger:SINGle:EDGE:LEVEl?

Description

Set the trigger level under SINGle EDGE trigger.

Parameter

Name	Type	Range	Default Value
<level>	Character string	40mV-10V	--

Return Format

The query returns the trigger level in character string.

Example

The command below sets the trigger level of SINGle EDGE trigger in CH1 to 25mv.

:TRIGger:SINGle:EDGE:SOURce CH1

:TRIGger:SINGle:EDGE:LEVEl 25mv
The query returns "25mv".
:TRIGger:SINGle:EDGE:LEVEl?

:TRIGger:SINGle:VIDeo

:TRIGger:SINGle:VIDeo:SOURce

Syntax
:TRIGger:SINGle:VIDeo:SOURce <source>
:TRIGger:SINGle:VIDeo:SOURce?

Description
Select the source of SINGle VIDeo trigger.

Parameter

Name	Type	Range	Default Value
<source>	Discrete	{CH1|CH2}	CH1

Return Format
The query returns "CH1" , "CH2".

Example
The command below selects "CH2" as the source under SINGle VIDeo trigger.
:TRIGger:SINGle:VIDeo:SOURce CH2
The query below returns "CH2".
:TRIGger:SINGle:VIDeo:SOURce?

:TRIGger:SINGle:VIDEo:MODU

Syntax
:TRIGger:SINGle:VIDEo:MODU <standard>
:TRIGger:SINGle:VIDEo:MODU?

Description
Select the video standard in SINGle VIDEo trigger.

Parameter

Name	Type	Range	Default Value
<standard>	Discrete	{PAL|SECAm|NTSC}	NTSC

Return Format

The query returns "PAL", "SECAm" or "NTSC".

Example

The command below select "NTSC" as the video standard under SINGle VIDEo trigger.

:TRIGger:SINGle:VIDEo:MODU NTSC

The query below returns "NTSC".

:TRIGger:SINGle:VIDEo:MODU?

:TRIGger:SINGle:VIDEo:SYNC

Syntax

:TRIGger:SINGle:VIDEo:SYNC <mode>

:TRIGger:SINGle:VIDEo:SYNC?

Description

Select the Synchronization Type among LINE, FIELD, ODDField, EVENfield or LNUMber in SINGle VIDEo trigger.

Parameter

Name	Type	Range	Default Value
<mode>	Discrete	{LINE|FIELd|ODD|EVEN|LNUM}	LINE

Return Format

The query returns "LINE", "FIELd", "ODD", "EVEN" or "LNUM".

Example

The command below select "ODD" as the Synchronization Type under SINGle VIDEo trigger.

:TRIGger:SINGle:VIDEo:SYNC ODD

The query below returns "ODD".

:TRIGger:SINGle:VIDEo:SYNC?

:TRIGger:SINGle:VIDEo:LNUM

Syntax

:TRIGger:SINGle:VIDEo:LNUM <line>

:TRIGger:SINGle:VIDEo:LNUM?

Description

Set the line number in SINGle VIDEo trigger when the synchronization type is "LNUM".

Parameter

Name	Type	Range	Default Value
<line>	Integer	NTSC：1 to 525 PAL：1 to 625 SECAm：1 to 625	1

Return Format

The query returns the line number in character string in SINGle VIDEo trigger. The source defaults to the current source.

Example

The command below sets "100" as the Line number in SINGle VIDEo trigger.

:TRIGger:SINGle:VIDEo:LNUM 100

The query below returns "100".

:TRIGger:SINGle:VIDEo:LNUM?

:TRIGger:SINGle:SWEEp <mode>

Syntax

:TRIGger:SINGle:SWEEp <mode>

:TRIGger:SINGle:SWEEp?

Description

Select the trigger mode.

Parameter

Name	Type	Range	Default Value
<mode>	Discrete	{AUTO|NORMal|SINGle}	AUTO

Return Format

The query returns the current trigger mode.

Example

The command below selects normal as trigger mode.

:TRIGger:SINGle:SWEEp NORMal

The query below returns "NORMal".

:TRIGger:SINGle:SWEEp?

:TRIGger:SINGle:HOLDoff

Syntax

:TRIGger:SINGle:HOLDoff <time>

:TRIGger:SINGle:HOLDoff?

Description

Set the trigger holdoff time.

Parameter

Name	Type	Range	Default Value
<time>	Character string	100ns to 10s	100ns

Return Format

The query returns the trigger holdoff time.

Example

The command below sets the trigger holdoff time to 1ms.

:TRIGger:SINGle:HOLDoff 1ms

The query below returns "1ms".

:TRIGger:SINGle:HOLDoff?

Other Commands

:AUTOset ON

Syntax

:AUTOset ON

Description

Enable the waveform auto setting function. The oscilloscope adjusts the vertical scale, horizontal time base and trigger mode according to the input signal automatically to realize optimum waveform display. The function of this command is the same with that of **Autoset** at the front panel.

Example

The command below enables the waveform auto setting function.

:AUTOset ON

:RUNNing

Syntax

:RUNNing <type>

Description

Starts/stops the oscilloscope. The functions of these commands are the same with those of **Run/Stop** at the front panel.

Parameter

Name	Type	Range	Default Value
<type>	Discrete	{RUN|STOP}	--

Example

The command below starts the oscilloscope.

:RUNNing RUN

:AG Command System

:FUNCtion Command Subsystem

:FUNCtion

Syntax

:FUNCtion < waveform >

:FUNCtion?

Description

Set/query the waveform function for current channel when using the arbitrary function generator.

Parameter

Name	Type	Range	Default Value
<wave>	Discrete	{SINE|SQUare|RAMP|PULSe|AmpALT|AttALT|StairDn|StairUD|StairUp|Besselj|Bessely|Sinc|ExpRise|Gauss|HaverSine|Log|Lorentz|Ln(x)|X^2}	

Return Format

The query returns <waveform> for current channel in character string.

Example
:FUNCtion RAMP
:FUNCtion?

:FUNCtion:FREQuency

Syntax
:FUNCtion:FREQuency < frequency>
:FUNCtion:FREQuency?

Description
Set/query the output frequency when using the arbitrary function generator.

Parameter
<frequency>, floating point number or decimal numbers that represents the frequency, in Hz. String with unit is also available, such as 1kHz.

Return Format
The query returns the frequency in character string
Example return:1.000000e+04

Explanation
This command is not available when the waveform is DC or noise

Example
The command below sets the output frequency of current channel to 10 kHz
:FUNCtion:FREQuency 10000
Query the waveform frequency value of the current channel
:FUNCtion:FREQuency?

:FUNCtion:PERiod

Syntax
:FUNCtion:PERiod < period >
:FUNCtion:PERiod?

Description
Set/query the output period of current channel when using the arbitrary function generator.

Parameter
<period>, floating point number or decimal numbers that represents the period, in seconds.

String with unit is also available, such as 100us.

Return Format

The query returns the output period of current channel in scientific notation.
Example return:1.000000e-04

Explanation

This command is not available when the waveform is DC or noise.

Example

The command below sets the output period of current channel to 10 μs.
:FUNCtion:PERiod 1e-5
Query the waveform period value of the current channel
:FUNCtion:PERiod?

:FUNCtion:AMPLitude

Syntax

:FUNCtion:AMPLitude < amplitude >
:FUNCtion:AMPLitude?

Description

Set/query the amplitude (PK-PK) of output function for current channel when using the arbitrary function generator.

Parameter

<amplitude>, floating point number or decimal numbers, in Vpp.
String with unit is also available, such as 0.1V.

Return Format

The query returns the amplitude of current channel in scientific notation.
Example return:1.000000e+00

Explanation

This command is not available when the waveform is DC.

Example

The command below sets the amplitude of current channel to 1.5 Vpp.
:FUNCtion:AMPLitude 1.5
The query below returns the amplitude of current channel.
:FUNCtion:AMPLitude?

:FUNCtion:OFFSet

Syntax

:FUNCtion:OFFSet < offset >

:FUNCtion:OFFSet?

Description

Set/query the offset of output function for current channel when using the arbitrary function generator.

Parameter

<offset>, floating point number or decimal numbers, in V.

String with unit is also available, such as 0.1V.

Return Format

The query returns the offset of output function for current channel in scientific notation.

Example return:0.000000e+00

Example

The command below sets the offset for current channel to 1 V.

:FUNCtion:OFFSet 1

Query current channel waveform offset value

:FUNCtion:OFFSet?

:FUNCtion:HIGHt

Syntax

:FUNCtion:HIGHt <high level>

:FUNCtion:HIGHt?

Description

Set/query the high level of output function for current channel when using the arbitrary function generator.

Parameter

<high level>, floating point number or decimal numbers, in V.

String with unit is also available, such as 0.1V.

Return Format

The query returns the high level of output function for current channel in scientific notation.

Example return:5.000000e-01

Example

The command below sets the high level for current channel to 1 V.

:FUNCtion:HIGHt 1

Query the high-level voltage value of the current channel waveform

:FUNCtion:HIGHt?

:FUNCtion:LOW

Syntax

:FUNCtion:LOW <low level>

:FUNCtion:LOW?

Description

Set/query the low level of output function for current channel when using the arbitrary function generator.

Parameter

<low level>, floating point number or decimal numbers, in V.

String with unit is also available, such as 0.1V.

Return Format

The query returns the low level of output function for current channel in scientific notation.

Example return:-5.000000e-01

Example

The command below sets the low level for current channel to -1 V.

:FUNCtion:LOW -1

The query below returns the low level for current channel.

:FUNCtion:LOW?

:FUNCtion:SYMMetry

Syntax

:FUNCtion:SYMMetry < symmetry >

:FUNCtion:SYMMetry?

Description

Set/query the symmetry of ramp waveform as a percentage for current channel when using the arbitrary function generator.

Parameter

<symmetry>,decimal numbers that represents the symmetry, in %.

Return Format

The query returns the symmetry of ramp waveform for current channel in floating point number.

Example return：50.0

Example

The command below sets the symmetry of ramp waveform for current channel to 60%.

:FUNCtion:SYMMetry 60

The query below returns the symmetry of ramp waveform for current channel.

:FUNCtion:SYMMetry?

:FUNCtion:WIDTh

Syntax

:FUNCtion:WIDTh < width >

:FUNCtion:WIDTh?

Description

Set/query the pulse width for current channel when using the arbitrary function generator.

Parameter

<width>, floating point number or decimal numbers, in seconds.

String with unit is also available, such as 1ms.

Return Format

The query returns the pulse width for current channel in scientific notation.

Example return：2.000000e-04

Example

The command below sets the pulse width for current channel to 20 μs.

:FUNCtion:WIDTh 2e-5

The query below returns the pulse width for current channel.

:FUNCtion:WIDTh?

:FUNCtion:RISIng

Syntax

:FUNCtion:RISIng <rising>

:FUNCtion:RISIng?

Description

Set/query the rising time for current channel when using the arbitrary function generator.

Parameter

<rising>, floating point number or decimal numbers, in seconds.

String with unit is also available, such as 1ms.

Return Format

The query returns the rising time for current channel in scientific notation.

Example return：2.000000e-04

Example

The command below sets the rising time for current channel to 20 μs.

:FUNCtion:RISIng 2e-5

The query below returns the rising time for current channel.

:FUNCtion:RISIng?

:FUNCtion:FALIng

Syntax

:FUNCtion:FALIng <faling>

:FUNCtion:FALIng?

Description

Set/query the falling time for current channel when using the arbitrary function generator.

Parameter

<falling>, floating point number or decimal numbers, in seconds.

String with unit is also available, such as 1ms.

Return Format

The query returns the falling time for current channel in scientific notation.

Example return：2.000000e-04

Example

The command below sets the rising time for current channel to 20 μs.

:FUNCtion:FALIng 2e-5

The query below returns the rising time for current channel.

:FUNCtion:FALIng?

:FUNCtion:DTYCycle

Syntax

:FUNCtion:DTYCycle < duty cycle >
:FUNCtion:DTYCycle?

Description

Set/query the duty cycle of the pulse waveform as a percentage for current channel when using the arbitrary function generator.

Parameter

<duty cycle>, floating point number, in %.

Return Format

The query returns the duty cycle of the pulse waveform for current channel in floating point number.
Example return：25.0

Example

The command below sets the duty cycle of the pulse waveform for current channel to 30%.
:FUNCtion:DTYCycle 30
The query below returns the duty cycle of the pulse waveform for current channel.
:FUNCtion:DTYCycle?

:FUNCtion:LOAD

Syntax

:FUNCtion:LOAD HIGHz
:FUNCtion:LOAD ON
:FUNCtion:LOAD?

Parameter

None.

Return Format

Return <bool> string.
The <bool> string returned by the query is such as: OFF.

:CHANnel Command Subsystem

:CHANnel

Syntax

:CHANnel <bool>

:CHANnel?

Description

Turn on/off output of AG.

Parameter

<bool>Bool data type

ON/OFF

Return Format

Return <bool> string.

The <bool> string returned by the query is such as: OFF.

Example

Turn on output of AG.

:CHANnel ON