VDS Series SCPI Protocol

History version	Modified content	Modifier	Time
V1.1	+)*RST、:CHANnel:INVerse、history version	Richard	2014.0809
V1.2	+)*LDM?、*RDM?、*RUNStop, modification description	Richard	2014.1114 2014.1126 2014.1127
V1.3	modification description,and thank you for translation	Xzr	2014.1210
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Introduction to the SCPI Language

Command Syntax

The command systems of VDS series present a hierarchy structure (tree system) and each command consists of a "Root" keyword and one or multiple sub-keywords. Command line always begins with colon ":",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 keywords and the fourth-level respectively. Command line always begins with colon ":", all the keywords are separated by ":" . < source > denotes the parameter that users can set. "?" denotes query; the command :TRIGger:SINGle:EDGE:SOURce and parameter 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. Special characters are used to separate keywords, data and sentences.

➢ **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 consists 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.

7) **Square Brackets []**
The parameter enclosed in the square brackets can be replaced by effective value or ignored. If not designated value for the parameter, default value will be used.

➢ **Parameter Type**

1) **Discrete**
The parameter should be one of the values listed.

For example,
:MEASure:SOURce <source>
:MEASure: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,
:CHANnel<n>:OFFSet <offset>
:CHANnel<n>:OFFSet?

wherein,
<n> can be set to 1 or 2, represents CH1 or CH2.
<offset> can be set to any integer between -250 and 250.
The query returns any integer between -250 and 250.

3) **Bool**
The parameter could be "OFF", "ON".

For example,
:CHANnel1:DISPlay <bool>
:CHANnel1: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:TYPE SAMPle

Abbreviation Below:
:ACQ:TYPE SAMP

Example 2:
:CHANnel1:SCALe 1v
Abbreviation Below:
:CHAN1:SCAL 1v

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Third-party API

The SCPI protocol of this product is based on USB port and LAN communication. After opening the pc software, SCPI protocol server is automatically activated. A client is provided in the sample Application, which can communicate with devices by sending SCPI commands to device and receiving feedback or data from device. Even more important, the code for client is easy, binded with server IP and port, and use network sockets to communicate. The client effect can be easily realised in the third-party software development.

*Common Commands

*ADC?

Syntax
*ADC? [n]

Description
Acquire ADC data on the screen for the designated channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{CH1|CH2|CH3|CH4}	CH1

Explanation
For one-channel oscilloscope, the range is {1}.
For two-channel oscilloscope, the range is {1|2}.
For four-channel oscilloscope, the range is {1|2|3|4}.

Return Format
The query returns specific ADC data.

Example
The query below returns 50,50,50,50,50,50,50,50,50,50,...
*ADC? CH1

*AUToset

Automatically set the device to best status.

Return Format
"success"or "failed".

*LDM?

Syntax
*LDM? [address]

Description
Acquire full sample data and save it to local server. [Address] indicates hard disk storage address of the server computer. LDM is abbreviation of Local Deep Memory Data.

Parameter

Name	Type	Range	Default Value
[address]	string	-----	Server installation directory

Explanation
[Address] is the default at server installation directory with default file name without input, format: current system date. bin.

Return Format

Return "success"or "failed", and return Saved@ "specific address"

Example
The command below will acquire and save full deep memory data to hard disk D of server computer.
*LDM? D:\

*RDM?

Syntax
*RDM?

Description
Aquire full sample data and save it to remote client. Usually on the same level as client or upper level directory, the directory address can be designated by developer, file name is dm.bin. RDM is abbreviation of Remote Deep Memory Data.

Return Format
Return"success"or "failed".

Example
The command below aquire full deep memory sample data and send to client.
*RDM?

*RUNStop

Syntax
*RUNStop
*RUNStop?

Description
Inquires or send this command to control Run and Stop.

Return Format
Return the status. Example：Set Run or Set Stop.

Example
If it is in run status, the command below will set it to stop status.
*RUNStop
If it is in stop status, the command below will set it to run status.
*RUNStop
The command below inquires the current status.
*RUNStop?

*IDN?

Description
The query returns the ID character string of the instrument.

Return Format
OWON,<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
OWON, VDS3104, VDS31041418200, V1.0.4

*RST

Restore the instrument to its default value.

Return Format
success" or "failed".

:MEASure Command Subsystem

:MEASure:SOURce

Syntax
:MEASure:SOURce <source>
:MEASure:SOURce?

Description
Select the measurement source of the 22 measurement parameters.

Parameter

Name	Type	Range	Default Value
<source>	Discrete	{CH1|CH2|CH3|CH4}	CH1

Explanation
This oscilloscope can measure 22 parameters.
You need to specify one measurement source for the following 20 parameters:
10 Voltage Measurement Items: Maximum, Minimum, Peak-Peak, Top, Bottom, Amplitude, Average, RMS, Overshoot and Preshoot.
12 Time Measurement Items: Period, Frequency, Rise Time, Fall Time, Positive Pulse Width, Negative Pulse Width, Positive Duty Cycle, Negative Duty Cycle, Delay 1→2⌐,
Delay 1→2↳, Delay 3→4⌐, Delay 3→4⌐.

Return Format
The query returns one or more than one channel among "CH1", "CH2", "CH3" and " CH4".

Example
The command below sets CH1 as the measurement source.
:MEASure:SOURce CH1
The query below returns "CH1".
:MEASure:SOURce?

:MEASure:ADD

Syntax
:MEASure:ADD <item>

Description
Add any one of or all of the 22 measurement items.

Parameter

Name	Type	Range	Default Value
<item>	Discrete	{ PERiod |FREQuency| AVERage |MAX| MIN |VTOP |VBASe |VAMP |PKPK |CYCRms |RTime |FTime |PDUTy |NDUTy |PWIDth| NWIDth |OVERshoot |PREShoot| RDELay| FDELay }	-----

The sequence of measurement items which corresponding to the ITEM above is as below:
Period, Frequency, Average, Maximum, Minimum,Top, Bottom, Amplitude, Peak-Peak, RMS, Rise Time, Fall Time, Positive Duty Cycle, Negative Duty Cycle, Positive Pulse Width, Negative Pulse Width, Overshoot, Preshoot, Delay 1→2⌐, Delay 1→2↳, Delay

3→4⌐, Delay 3→4⌐.

Explanation
This oscilloscope can measure 22 parameters.
You need to specify one measurement source for the following 20 parameters:
10 Voltage Measurement Items: Maximum, Minimum, Peak-Peak, Top, Bottom, Amplitude, Average, RMS, Overshoot and Preshoot.
12 Time Measurement Items: Period, Frequency, Rise Time, Fall Time, Positive Pulse Width, Negative Pulse Width, Positive Duty Cycle, Negative Duty Cycle, Delay 1→2⌐, Delay 1→2⌐, Delay 3→4⌐, Delay 3→4⌐.

Example
The command below adds the measurement item PERiod.
:MEASure:ADD PERiod

:MEASure:DELete

Syntax
:MEASure:DELete <item>

Description
Delete specified or all measurement items.

Parameter

Name	Type	Range	Default Value
<item>	Discrete	{ PERiod |FREQuency| AVERage |MAX| MIN |VTOP |VBASe |VAMP |PKPK |CYCRms |RTime |FTime |PDUTy |NDUTy |PWIDth| NWIDth |OVERshoot |PREShoot| RDELay| FDELay }	-----

Explanation
This oscilloscope can measure 22 parameters.
You need to specify one measurement source for the following 22 parameters:
10 Voltage Measurement Items: Maximum, Minimum, Peak-Peak, Top, Bottom, Amplitude, Average, RMS, Overshoot and Preshoot.
12 Time Measurement Items: Period, Frequency, Rise Time, Fall Time, Positive Pulse Width, Negative Pulse Width, Positive Duty Cycle, Negative Duty Cycle, Delay 1→2⌐, Delay 1→2⌐, Delay 3→4⌐, Delay 3→4⌐.

Note:
1.When sending the command :MEASure:DELete ALL, all the measurements will be deleted and the checked channel will be canceled.

Example
The command below deletes MAX measurement.
:MEASure:DELete MAX

:MEASure:PERiod?

Syntax
:MEASure[n]:PERiod?

Description

Query the measurement value of the period of the current selected channel. The default unit is s.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].

If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.

For one-channel oscilloscope, the Range is { 1 }.

For two-channel oscilloscope, the Range is {1|2}.

For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format

The query returns the measurement result in character string.

Example

The query below returns the measurement value of the period of current channel.

:MEASure:PERiod?

:MEASure:FREQuency?

Syntax

:MEASure[n]:FREQuency?

Description

Query the measurement value of the period of the current selected channel.

The default unit is Hz.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].

If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.

For one-channel oscilloscope, the Range is { 1 }.

For two-channel oscilloscope, the Range is {1|2}.

For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format

The query returns the measurement result in character string.

Example

The query below returns the measurement value of the frequency of current channel.
:MEASure:FREQuency?

:MEASure:AVERage?

Syntax
:MEASure[n]:AVERage?

Description
Query the measurement value of the average of the current selected channel. Unit depends on current unit of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
 The query below returns the measurement value of the average of current channel.
:MEASure:AVERage?

:MEASure:MAX?

Syntax
:MEASure[n]:MAX?

Description
Query the measurement value of the max of the current selected channel. Unit depends on current unit of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].

If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.

For one-channel oscilloscope, the Range is { 1 }.

For two-channel oscilloscope, the Range is {1|2}.

For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format

The query returns the measurement result in character string.

Example

The query below returns the measurement value of the max of current channel.

:MEASure:MAX?

:MEASure:MIN?

Syntax

:MEASure[n]:MIN?

Description

Query the measurement value of the min of the current selected channel. Unit depends on current unit of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].

If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.

For one-channel oscilloscope, the Range is { 1 }.

For two-channel oscilloscope, the Range is {1|2}.

For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format

The query returns the measurement result in character string.

Example

The query below returns the measurement value of the Min of current channel.

:MEASure:MIN?

:MEASure:VTOP?

Syntax

:MEASure[n]:TOP?

Description
Query the measurement value of the top of the current selected channel. Unit depends on current unit of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the top of current channel.
:MEASure:TOP?

:MEASure:VBASe?

Syntax
:MEASure[n]: VBASe?

Description
Query the measurement value of the Vbase of the current selected channel. Unit depends on current unit of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example

The query below returns the measurement value of the Vbase of current channel.
:MEASure:VBASE?

:MEASure:VAMP?

Syntax
:MEASure[n]: VAMP?

Description
Query the measurement value of the Vamp of the current selected channel. Unit depends on current unit of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the Vamp of current channel.
:MEASure:VAMP?

:MEASure:PKPK?

Syntax
:MEASure[n]: PKPK?

Description
Query the measurement value of the PKPK of the current selected channel. Unit depends on current unit of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.

For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the PKPK of current channel.
:MEASure:PKPK?

:MEASure:CYCRms?

Syntax
:MEASure[n]: CYCRms?

Description
Query the measurement value of the CYCRms of the current selected channel. Unit depends on current unit of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the CYCRms of current channel.
:MEASure:CYCRms?

:MEASure:RTIMe?

Syntax
:MEASure[n]: RTIMe?

Description
Query the measurement value of the RTime of the current selected channel. Unit is Sec(s).

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].

If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.

For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the RTime of current channel.
:MEASure:RTime?

:MEASure:FTIMe?

Syntax
:MEASure[n]: FTIMe?

Description
Query the measurement value of the FTime of the current selected channel. Unit is Sec(s).

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].

If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.

For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the FTime of current channel.
:MEASure:FTime?

:MEASure:PDUTy?

Syntax
:MEASure[n]: PDUTy?

Description
Query the measurement value of the PDUTy of the current selected channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].

If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.

For one-channel oscilloscope, the Range is { 1 }.

For two-channel oscilloscope, the Range is {1|2}.

For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format

The query returns the measurement result in character string.

Example

The query below returns the measurement value of the PDUTy of current channel.

:MEASure:PDUTy?

:MEASure:NDUTy?

Syntax

:MEASure[n]: NDUTy?

Description

Query the measurement value of the NDUTy of the current selected channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].

If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.

For one-channel oscilloscope, the Range is { 1 }.

For two-channel oscilloscope, the Range is {1|2}.

For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format

The query returns the measurement result in character string.

Example

The query below returns the measurement value of the NDUTy of current channel.

:MEASure:NDUTy?

:MEASure:PWIDth?

Syntax

:MEASure[n]: PWIDth?

Description

Query the measurement value of the PWIDth of the current selected channel. Unit is Sec(s).

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format

The query returns the measurement result in character string.

Example

The query below returns the measurement value of the PWIDth of current channel.

:MEASure:PWIDth?

:MEASure:NWIDth?

Syntax

:MEASure[n]: NWIDth?

Description

Query the measurement value of the NWIDth of the current selected channel. Unit is Sec(s).

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation

Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format

The query returns the measurement result in character string.

Example
The query below returns the measurement value of the NWIDth of current channel.
:MEASure:NWIDth?

:MEASure:OVERshoot?

Syntax
:MEASure[n]: OVERshoot?

Description
Query the measurement value of the OVERshoot of the current selected channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the OVERshoot of current channel.
:MEASure:OVERshoot?

:MEASure:PREShoot?

Syntax
:MEASure[n]: PREShoot?

Description
Query the measurement value of the PREShoot of the current selected channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.

For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the PREShoot of current channel.
:MEASure:PREShoot?

:MEASure:RDELay?

Syntax
:MEASure[n]: RDELay?

Description
Query the measurement value of the RDELay of the current selected channel. Unit is Sec(s).

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
When [n] is replaced with 1 or 2, this command measures rise delay time from channel 1 to channel 2. When [n] is replaced with 3 or 4, this command measures rise dalay time from channel 3 to channel 4.
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the RDELay of current channel.
:MEASure:RDELay?

:MEASure:FDELay?

Syntax
:MEASure[n]: FDELay?

Description
Query the measurement value of the FDELay of the current selected channel. Unit is Sec(s).

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1

Explanation
When [n] is replaced with 1 or 2, this command measures fall delay time from channel 1 to channel 2. When [n] is replaced with 3 or 4, this command measures fall dalay time from channel 3 to channel 4.
Parameter[n] indicates channel, it can be ignored, and the default channel is the current seleted one, The default value could be change.If [n] is replaced with a value, then the query returns measurement value of channel [n].
If no specified unit, then default unit will be Volt(v) for voltage. And default unit for time is Sec(s). Default unit for frequency is Hz. Default unit for percent is decimal form, for example 88% is 0.88.
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return format
The query returns the measurement result in character string.

Example
The query below returns the measurement value of the FDELay of current channel.
:MEASure:FDELay?

:MEASure:RECVamp?

Syntax
:MEASure[n]: RECVAMP?

Description
Query the measurement value Vamp of square waveform.

Return format
The query returns the measurement amplitude as pixels in character string.

Example
The query below returns the measurement value Vamp of square waveform.
:MEASure:RECVAMP?

:ACQuire Command Subsystem

:ACQuire:TYPE

Syntax
:ACQuire:TYPE <type>
:ACQuire:TYPE?

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 <count> 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:TYPE AVERage
The query below returns "AVERage".
:ACQuire:TYPE?

:ACQuire:AVERage <count>

Syntax
:ACQuire:AVERage <count>
:ACQuire:AVERage?

Description
Set the number of averages.

Parameter

Name	Type	Range	Default Value
<count>	interger	{1~128}	4

Explanation
At present, the number of averages can be set is interger ranges from 1~ 128.

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 64
The query below returns "64".
:ACQuire:AVERage?

:ACQuire:MDEPth <mdep>

Syntax
:ACQuire:MDEPth <mdep>
:ACQuire:MDEPth?

Description
Set the number of waveform points that the oscilloscope can store in a single trigger sample.

Parameter

Name	Type	Range	Default Value
<mdep>	Discrete	{1K | 10K | 100K | 1M | 5M or 10M}	10K

Return format
The query returns the actual number of points (integer).

Example
The command below sets the memory depth to "10K ".
:ACQuire:MDEPth 10K
The query below returns the actual number of points, for example "10K ".
:ACQuire:MDEPth?

:TIMebase Command Subsystem

:TIMebase:SCALe

Syntax
:TIMebase:SCALe <scale_value>
:TIMebase:SCALe?

Description
Set the scale of the main time base.

Parameter

Name	Type	Range	Default Value
<scale_value>	Discrete	Please refer to Explanation	----

Explanation：Default to set the main time base.

VDS2062,VDS2064,VDS1022 time base gear
{5ns | 10ns | 20ns | 50ns | 100ns | 200ns | 500ns | 1us | 2us | 5us | 10us | 20us | 50us | 100us | 200us | 500us | 1ms | 2ms | 5ms | 10ms | 20ms | 50ms | 100ms | 200ms | 500ms | 1s | 2s | 5s | 10s | 20s | 50s | 100s}

VDS3102,VDS3104 time base gear
{2ns | 5ns | 10ns | 20ns | 50ns | 100ns | 200ns | 500ns | 1us | 2us | 5us | 10us | 20us | 50us | 100us | 200us | 500us | 1ms | 2ms | 5ms | 10ms | 20ms | 50ms | 100ms | 200ms |500ms | 1s |2s |5s |10s |20s | 50s | 100s}

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

:TIMebase:HOFFset

Syntax
:TIMebase:HOFFset <value>
:TIMebase:HOFFset?

Description
Set the Horizontal offset of the time base.

Parameter

Name	Type	Range	Default Value
<value>	Integer	From -500 to +500000 （horizontal offset pixels）	0

Return Format
The query returns the offset in character string.

Explanation
Each div consists of 50 pixels along the horizontal direction. If the current main time base is 500us/div, and suppose the horizontal offset pixels are 100(that is 2div), then the horizontal offset time is 1.000ms. When timebase under slow mode, this command is invalid, it is only available when timebase under non-slow mode.

Example
The command below sets the horizontal offset of channel1 to 50.
:TIMebase:HOFFset 50
The query returns horizontal offset pixels.
:TIMebase:HOFFset?

:FFT Command Subsystem

:FFT:DISPlay <bool>

Syntax
:FFT:DISPlay <bool>
:FFT:DISPlay?

Description
Turn the display of FFT 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 FFT on.
:FFT:DISPlay ON
The query returns "OFF".
:FFT:DISPlay?

:FFT: FREQbase<hz>

Syntax
:FFT: FREQbase< hz >
:FFT: FREQbase?

Description
Set the center frequency of the FFT spectrum.

Parameter

Name	Type	Range	Default Value
< hz >	Discrete	Please Refer to Explanation	-------

Explanation：

 VDS2062,VDS2064 FFT center frequency
{0.05Hz | 0.1Hz | 0.25Hz | 0.5Hz | 1Hz | 2.5Hz |5Hz | 10Hz | 25Hz | 50Hz
| 100Hz | 250Hz | 500Hz | 1KHz | 2.5KHz | 5KHz | 10KHz | 25KHz | 50KHz
| 125KHz | 250KHz | 500KHz | 1.25KHz | 2.5KHz | 5MHz | 12.5MHz | 25MHz
| 50MHz | 100MHz | 200MHz | 400MHz | 800MHz }

VDS3102,VDS3104 FFT center frequency
{0.05Hz |0.1Hz | 0.25Hz | 0.5Hz | 1Hz | 2.5Hz |5Hz | 10Hz | 25Hz | 50Hz
| 100Hz | 250Hz | 500Hz | 1KHz | 2.5KHz | 5KHz | 10KHz | 25KHz | 50KHz
| 125KHz | 250KHz | 500KHz | 1.25KHz | 2.5KHz | 5MHz | 12.5MHz | 25MHz
| 50MHz | 100MHz | 200MHz | 400MHz | 800MHz | 1.6GHz }

VDS1022 FFT center frequency
{0.125Hz | 0.25Hz | 0.625Hz | 1.25Hz | 2.5Hz |6.25Hz | 12.5Hz | 25Hz | 50Hz
| 62.5Hz | 125Hz | 250Hz | 625Hz | 1.25KHz |2.5KHz | 6.25KHz | 12.5KHz | 25KHz
|62.5KHz| 125KHz | 250KHz | 625KHz | 1.25MHz|2.5MHz | 5MHz }

Return format
The query returns the frequency value in character string.

Example
The command below sets the center frequency of the FFT spectrum to 10 MHz.
:FFT: FREQbase 10MHz
The query returns "10MHz".
:FFT: FREQbase?

:FFT:SOURce <source>

Syntax
:FFT:SOURce <source>
:FFT:SOURce?

Description
Select the signal source of FFT operation.

Parameter

Name	Type	Range	Default Value
<source >	Discret	{CH1|CH2|CH3|CH4}	CH1

Explanation
For one-channel oscilloscope, the Range is { 1 }.
For two-channel oscilloscope, the Range is {1|2}.
For four-channel oscilloscope, the Range is {1|2|3|4}.

Return Format
The query returns "CH1", "CH2","CH3" or "CH4".

Example

The command below selects channel 1 as the signal source.
:FFT:SOURce CH1
The query below returns "CH1".
:FFT:SOURce?

:FFT:FORMat VRMS <vrms_scale>

Syntax
:FFT:FORMat VRM <vrms_scale>
:FFT:FORMat?

Description
Set the VRMS scale of FFT.

Parameter

Name	Type	Range	Default Value
< vrms_scale >	Discrete	{2mv|5mv|10mv|20mv|50mv|100mv|200mv|500mv|1v|2v|5v||10v}	---

Description
Parameter should be numeric without unit, default unit for voltage is V.

Return format
The query returns VRMS or DB.

Example
The command below select VRMS as FFT format, and set VRMS scale to 0.5V, ie. 500mV
:FFT:FORMat VRMS 0.5
The query below returns VRMS.
:FFT:FORMat?

:FFT:FORMat DB <dB_scale>

Syntax
:FFT:FORMat DB <dB_scale>
:FFT:FORMat?

Description
Set the DB scale of FFT.

Parameter

Name	Type	Range	Default Value
< dB_scale>	Discrete	{1DB|2DB|5DB|10DB|20DB}	------

Explanation
The query returns DB.

Return format
The command below select DB as FFT format, and set 2DB.
:FFT:FORMat   DB 2DB

The query returns DB.
:FFT:FORMat?

:FFT:WINDow \<item\>

Syntax
:FFT:WINDow \<item\>
:FFT:WINDow?

Description
Select the window function of FFT operation.

Parameter

Name	Type	Range	Default Value
\< item \>	Discrete	{RECTangle|HANNing|HAMMing|BLACkman}	RECTangle

Return Format
The query returns "RECT","HANN',"HAMM" or "BLAC".

Example
The command below selects RECTangle.
:FFT:WINDow RECTangle
The query returns " RECTangle".
:FFT:WINDow?

:FFT:ZONE \<factor\>

Syntax
:FFT:ZONE \<factor\>
:FFT:ZONE?

Description
Select the scaling of FFT operation.

Parameter

Name	Type	Range	Default Value
\< factor \>	Discrete	{X1|X2|X5|X10}	X1

Return Format
The query returns X1,X2,X5 or X10.

Example
The command below sets "X5" as the scaling.
:FFT:ZONE X5
The query returns "X5".
:FFT:ZONE?

:CHANnel Command Subsystem

:CHANnel:DISPlay

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

Description
Turn the display of the channel on or off.

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2|3|4}	1
<bool>	Bool	{OFF|ON}	OFF

Explaination
For one-channel oscilloscope, the range is {1}.
For two-channel oscilloscope, the range is {1|2}.
For four-channel oscilloscope, the range is {1|2|3|4}.

Return Format
The query returns "OFF"or"ON".

Example
The command below turns the display of channel1 on.
:CHANnel1:DISPlay ON
The query returns "ON".
:CHANnel1:DISPlay?

:CHANnel:COUPling

Syntax
:CHANnel<n>:COUPling <coupling>
:CHANnel<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|3|4}	1
<coupling>	Discrete	{AC|DC|GND}	DC

Explaination
For one-channel oscilloscope, the range is {1}.
For two-channel oscilloscope, the range is {1|2}.
For four-channel oscilloscope, the range is {1|2|3|4}.

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

Example
The command below sets the input coupling mode of channel 1 to "DC".
:CHANnel1:COUPling DC
The query returns"DC".
:CHANnel1:COUPling?

:CHANnel:PROBe

Syntax
:CHANnel\<n\>:PROBe \<atten\>
:CHANnel\<n\>:PROBe?

Description
Set the attenuation ratio of the probe.

Parameter

Name	Type	Range	Default Value
\<n\>	Discrete	{1|2|3|4}	1
\<atten\>	Discrete	{X1|X10|X100|X1000}	X10

Explaination
For one-channel oscilloscope, the range is {1}.
For two-channel oscilloscope, the range is {1|2}.
For four-channel oscilloscope, the range is {1|2|3|4}.

Return Format
The query returns"X1","X10","X100"or"X1000".

Example
The command below sets the attenuation ratio of the probe connected to channel1 to 10.
:CHANnel1:PROBe X10
The query returns"X10",
:CHANnel1:PROBe?

:CHANnel:SCALe

Syntax
:CHANnel\<n\>:SCALe \<scale\>
:CHANnel\<n\>:SCALe?

Description
Set the vertical scale of the specified waveform display.

Parameter

Name	Type	Range	Default Value
\<n\>	Discrete	{1|2|3|4}	1
\<scale\>	Discrete	Please refer to Explanation	----

Explaination
For one-channel oscilloscope, the range is {1}.
For two-channel oscilloscope, the range is {1|2}.
For four-channel oscilloscope, the range is {1|2|3|4}.

Scale range under probe rate X1
VDS2062 VDS1022 and VDS2064:
{5mv|10mv|20m v|50mv|100mv|200m v|500mv|1v|2v|5v}

VDS3102 and VDS3104:
{2mv|5mv|10mv|20m v|50mv|100mv|200m v|500mv|1v|2v|5v}

Scale range under probe rate besides X1

The value should be adjusted according to probe rate, each scale value multiply the probe rate results in the real scale value. For example, 500mv/div at X1 rate, 5v/div at X10 rate, 50v/div at X100 rate, 500v/div at X1000 rate.

Return Format
The query returns the vertical scale in character string.

Example
The command below sets the vertical scale of channel 1 to 500mV/div.
The default unit for voltage is volt(v).
:CHANnel1:SCALe 0.5
 The query returns"0.5".
:CHANnel1:SCALe?

:CHANnel:OFFSet

Syntax
:CHANnel<n>:OFFSet <offset>
:CHANnel<n>:OFFSet?

Description
Set the vertical offset of the specified waveform display.

Parameter

Name	Type	Range	Default Value
<n>	Discrete	{1|2|3|4}	1
<offset>	Integer	From -250 to 250 （pixels）	0

Explanation
Each div consists of 25 pixels,if vertical offset is 20,then it means 20/25= 0.8div

Return Format
The query returns the offset value in character string.

Example
The command below sets the vertical offset of channel 1 to 25 pixels, one div is 25 pixels.
:CHANnel1:OFFSet 25
The query below returns 25pixels.
:CHANnel1:OFFSet?

:CHANnel:HARDfreq?

Syntax
:CHANnel[n]: HARDfreq?

Description
To query hardware frequency value of specified channel.

Return format
The query returns the frequency value in character string.

Example
The query below returns hardware frequency value of channel 1.
:CHANnel1: HARDfreq?

:CHANnel:INVerse

Syntax
:CHANnel[n]: INVerse <bool>
:CHANnel[n]: INVerse?

Description
Query or set waveform inverse of specified channel.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1
<bool>	Bool	{OFF|ON}	OFF

Description
For one-channel oscilloscope, the range is {1}.
For two-channel oscilloscope, the range is {1|2}.
For four-channel oscilloscope, the range is {1|2|3|4}.

Return format
The query returns "OFF"or "ON".

Example
The command below turns on waveform inverse of channel 1.
:CHANnel1: INVerse ON
The query below returns "ON".
:CHANnel1: INVerse?

:CHANnel:CURRent

Syntax
:CHANnel[n]: CURRent <bool>
:CHANnel[n]: CURRent?

Description
Query or set measure current of specified channel switch.

Parameter

Name	Type	Range	Default Value
[n]	Discrete	{1|2|3|4}	1
<bool>	Bool	{OFF|ON}	OFF

Description
For one-channel oscilloscope, the range is {1}.
For two-channel oscilloscope, the range is {1|2}.
For four-channel oscilloscope, the range is {1|2|3|4}.

Return format
The query returns "OFF"or "ON".

Example
The command below turns on measure current of channel 1.
:CHANnel1:CURRent ON
The query below returns "ON".
:CHANnel1:CURRent?

:LAN Command Subsystem

:LAN:IPADdress

Syntax
:LAN:IPADdress <string>
:LAN:IPADdress?

Description
Set the IP address of the instrument.

Parameter

Name	Type	Range	Default Value
<string>	ASCIICharacter String	nnn,nnn,nnn,nnn	0,0,0,0

Explanation
When setting the <string>, the range of the first nnn is from 0 to 223 (except 127) and the ranges of the other three nnn are from 0 to 255.

Return Format
The query returns the current IP address in character string.

Example
The command below sets the IP address to: 192.168.1.80.
:LAN:IPADdress 192.168.1.80
The query returns "192.168.1.80".
:LAN:IPADdress?

:LAN:PORT

Syntax
:LAN:PORT <value>
:LAN:PORT?

Description
Distribute a port for the instrument.

Parameter

Name	Type	Range	Default Value
<value>	Integer	1 ~3000	3000

Explanation
When setting the <value>, the range of the port is from 1 to 3000.

Return Format
The query returns the current port value in character string.

Example
The command below sets the port value to:3000.
:LAN:PORT 3000
The query returns "3000".
:LAN:PORT?

:LAN:GATeway

Syntax
:LAN:GATeway <string>
:LAN:GATeway?

Description
Distribute a gateway for the instrument.

Parameter

Name	Type	Range	Default Value
<string>	ASCIICharacter String	nnn,nnn,nnn,nnn	0,0,0,0

Explanation
When setting the <string>, the range of the first nnn is from 0 to 223 (except 127) and the ranges of the other three nnn are from 0 to 255.

Return Format
The query returns the current gateway in character string.

Example
The command below sets the gateway to:192.168.1.1.
:LAN:GATeway 192.168.1.1
The query returns"192.168.1.1".
:LAN:GATeway?

:LAN:SMASk

Syntax
:LAN:SMASk <string>
:LAN:SMASk?

Description
Distribute a subnet mask for the instrument.

Parameter

Name	Type	Range	Default Value
<string>	ASCIICharacter String	nnn,nnn,nnn,nnn	0,0,0,0

Explanation
When setting the <string>, the range of each nnn is from 0 to 255.

Return Format
The query returns the current subnet mask in character string.

Example
The command below sets the subnet mask to: 255.255.255.0.

:LAN:SMASk 255,255,255,0
The query returns "255.255.255.0".
:LAN:SMASk?

:LAN:RESTart

Syntax
:LAN:RESTart <switch>

Description
Restart the oscilloscope.

Parameter

Name	Type	Range	Default Value
<switch>	Discrete	{ON|OFF}	OFF

Explanation
After setting net parameters, send ":LAN:RESTart ON" and close the SCPI interface. After automatic restart, enter SCPI again. By query, the new net parameters would be those you set.

:TRIGger Command Subsystem

:TRIGger:TYPE <type>

Syntax
:TRIGger:TYPE <type>
:TRIGger:TYPE?

Description
Select the trigger type.

Parameter

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

Return Format
The query returns the current trigger type.

Example
The command below selects slope trigger.
:TRIGger:TYPE SINGle
The query below returns "SINGle".
:TRIGger:TYPE?

:TRIGger:MODE <mode>

Syntax
:TRIGger:MODE <mode>
:TRIGger:MODE?

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. When ALT, the trigger mode can only be AUTO.

Example

The command below selects normal as trigger mode.
:TRIGger:MODE NORMal
The query below returns"NORMal".
:TRIGger:MODE?

:TRIGger:SINGle <Smode>

Syntax

:TRIGger:SINGle <Smode>
:TRIGger:SINGle?

Description

Select the trigger type edge or video under single trigger.

Parameter

Name	Type	Range	Default Value
<Smode>	Discrete	{EDGE|VIDeo }	EDGE

Return Format

The query returns "EDGE" or " VIDeo".

Example

The command below selects "VIDeo" as trigger type under single trigger.
:TRIGger:SINGle VIDeo
The query below returns "VIDeo".
 :TRIGger:SINGle?

:TRIGger:ALT <Amode>

Syntax

:TRIGger:ALT <mode>
:TRIGger:ALT?

Description

Select the trigger type edge or video under ALT trigger.

Parameter

Name	Type	Range	Default Value
<Amode>	Discrete	{EDGE|VIDeo }	EDGE

Return Format

The query returns "EDGE" or " VIDeo".

Example

The command below selects "VIDeo" as trigger type under ALT trigger.
:TRIGger:ALT VIDeo
The query below returns "VIDeo".
:TRIGger:ALT?

:TRIGger:SINGle:EDGE

:TRIGger:SINGle:EDGE:SOURce

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

Description
Select the source under SINGle EDGE trigger.

Parameter

Name	Type	Range	Defaut Value
<source>	Discrete	{CH1|CH2|CH3|CH4 }	CH1

Return Format
For one-channel oscilloscope, the query returns "CH1".
For two-channel oscilloscope, the query returns "CH1" or "CH2".
For four-channel oscilloscope, the query returns "CH1", "CH2", "CH3" or "CH4".

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

:TRIGger:SINGle:EDGE:SLOPe

Syntax
:TRIGger:SINGle:EDGE:SLOPe <slope>
:TRIGger:SINGle:EDGE:SLOPe?

Description
Select the slope under SINGle EDGE trigger.

Parameter

Name	Type	Range	Defaut Value
<slope>	Discrete	{RISE|FALL}	RISE

Return Format
The query returns "RISE " or "FALL".

Example
The command below selects "FALL" as the slope under SINGle EDGE trigger.
:TRIGger:SINGle:EDGE:SLOPe FALL
The query below returns "FALL".
:TRIGger:SINGle:EDGE:SLOPe?

:TRIGger:SINGle:EDGE:LEVel

Syntax
:TRIGger:SINGle:EDGE:LEVel <level>
:TRIGger:SINGle:EDGE:LEVel?

Description
Set the trigger level under SINGle EDGE trigger. And the unit is in accordance with the current unit of the voltage.

Parameter

Name	Type	Range	Defaut Value
<level>	Integer (pixel number)	from（-6div - zero position）×25 to （6div - zero position）×25 (25 is pixels/div)	0

Explanation
Each div consists of 25 pixels along the vertical direction. If the query returns "20" for trigger level, which means 0.8div, and if the vertical scale is 1v/div, then the trigger level would be 0.8v,that is 800mv.

Here are the calculation steps.
20pixels /25pixels=0.8div
0.8div * 1v/div = 0.8v

Return Format
The query returns the pixels number of the trigger level in character string.

Example
The command below sets"25" as the trigger level under SINGle EDGE trigger.
:TRIGger:SINGle:EDGE:LEVel 25
The query returns "25".
: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 under SINGle VIDeo trigger.

Parameter

Name	Type	Range	Defaut Value
<source>	Discrete	{CH1|CH2|CH3|CH4 }	CH1

Return Format
For one-channel oscilloscope, the query returns "CH1".
For two-channel oscilloscope, the query returns "CH1" or "CH2".

For four-channel oscilloscope, the query returns "CH1", "CH2", "CH3" or "CH4".

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 video standard under SINGle VIDeo trigger.

Parameter

Name	Type	Range	Defaut 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 under SINGle VIDeo trigger.

Parameter

Name	Type	Range	Defaut 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 line number under SINGle VIDeo trigger when the synchronization type is "LNUM".

Parameter

Name	Type	Range	Defaut Value
<line_num>	Integer	NTSC：from 1 to 525 PAL：from1 to 625 SECam：from 1 to 625	1

Return Format
The query returns line number in character string under SINGle VIDeo trigger. And the source defaults to the current source.

Example
The command below sets "100" as the Line number under SINGle VIDeo trigger.
:TRIGger:SINGle:VIDeo:LNUM 100
The query below returns"100".
:TRIGger:SINGle:VIDeo:LNUM?

:TRIGger:ALT:EDGE

:TRIGger:ALT:EDGE:SOURce

Syntax
:TRIGger:ALT:EDGE:SOURce <source>
:TRIGger:ALT:EDGE:SOURce?

Description
Select the source under ALT EDGE trigger.

Parameter

Name	Type	Range	Defaut Value
<source>	Discrete	{CH1|CH2|CH3|CH4 }	CH1

Return Format
For one-channel oscilloscope, the query returns "CH1".
For two-channel oscilloscope, the query returns "CH1" or "CH2".
For four-channel oscilloscope, the query returns "CH1", "CH2", "CH3" or "CH4".

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

:TRIGger:ALT:EDGE:SLOPe

Syntax
:TRIGger:ALT:EDGE:SLOPe <slope>
:TRIGger:ALT:EDGE:SLOPe?

Description
Select the slope under ALT EDGE trigger.

Parameter

Name	Type	Range	Defaut Value
<slope>	Discrete	{RISE|FALL}	RISE

Return Format
The query returns "RISE " or "FALL".

Example
The command below selects "FALL" as the slope under ALT EDGE trigger.
:TRIGger:ALT:EDGE:SLOPe FALL
The query below returns "FALL".
:TRIGger:ALT:EDGE:SLOPe?

:TRIGger:ALT:EDGE:LEVel

Syntax
:TRIGger:ALT:EDGE:LEVel <level>
:TRIGger:ALT:EDGE:LEVel?

Description
Set the trigger level under ALT EDGE trigger. And the unit is in accordance with the current unit of the voltage.

Parameter

Name	Type	Range	Defaut Value
<level>	Integer (pixel number)	from （-6div - zero position） ×25 to （6div - zero position）×25 (25 is pixels/div)	0

Explanation
Each div consists of 25 pixels along the vertical direction. If the query returns "20" for trigger level, which means 0.8div, and if the vertical scale is 1v/div, then the trigger level would be 0.8v,that is 800mv.

Here are the calculation steps.
20pixels /25pixels=0.8div
0.8div * 1v/div = 0.8v

Return Format
The query returns the pixels number of the trigger level in character string.

Example
The command below sets"50" as the trigger level under ALT EDGE trigger.
 :TRIGger:ALT:EDGE:LEVel 50
The query returns "50".

:TRIGger:ALT:VIDeo

:TRIGger:ALT:VIDeo:SOURce

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

Description
Select the source under ALT VIDeo trigger.

Parameter

Name	Type	Range	Defaut Value
<source>	Discrete	{ CH1|CH2|CH3|CH4 }	CH1

Return Format
For one-channel oscilloscope, the query returns "CH1".
For two-channel oscilloscope, the query returns "CH1" or "CH2".
For four-channel oscilloscope, the query returns "CH1", "CH2", "CH3" or "CH4".
Vedio trigger under ALT mode, only one channel is available.

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

:TRIGger:ALT:VIDeo:MODU

Syntax
:TRIGger:ALT:VIDeo:MODU <standard>
:TRIGger:ALT:VIDeo:MODU?

Description
Select video standard under ALT VIDeo trigger.

Parameter

Name	Type	Range	Defaut 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 ALT VIDeo trigger.
:TRIGger:ALT:VIDeo:MODU NTSC
The query below returns"NTSC".
:TRIGger:ALT:VIDeo:MODU?

:TRIGger:ALT:VIDeo:SYNC

Syntax
:TRIGger:ALT:VIDeo:SYNC <mode>
:TRIGger:ALT:VIDeo:SYNC?

Description
Select the Synchronization Type among LINE,FIELD,ODDField,EVENfield or LNUMber under ALT VIDeo trigger.

Parameter

Name	Type	Range	Defaut 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 ALT VIDeo trigger.
:TRIGger:ALT:VIDeo:SYNC ODD
The query below returns"ODD".
:TRIGger:ALT:VIDeo:SYNC?

:TRIGger:ALT:VIDeo:LNUM

Syntax
:TRIGger:ALT:VIDeo:LNUM<line>
:TRIGger:ALT:VIDeo:LNUM?

Description
Set line number uner ALT VIDeo trigger and the synchronization type is "LNUM".

Parameter

Name	Type	Range	Defaut Value
<line>	Integer	NTSC：from1 to 525 PAL：from 1 to 625 SECam：from 1 to 625	1

Return Format
The query returns line number in character string under ALT VIDeo trigger. And the source defaults to the current source.

Example
The command below sets "100" as the Line number under ALT VIDeo trigger.
:TRIGger:ALT:VIDeo:LNUM100
The query below returns"100".
:TRIGger:ALT:VIDeo:LNUM?

:SAVE Command Subsystem

:SAVE:CSV <file_spec>

Syntax
:SAVE:CSV<file_spec>

Description
Save waveform data in the specified file path.

Parameter

Name	Type	Range	Default Value
<file_spec>	ASCII String	Please refer to the instructions	--

xplanEation
The parameter <file_spec>contains the file storage path and suffixed file name. If a file with the same name already exists in the specified path, the original file is overwritten. Supported suffix names include csv, txt, bin.

Return Format
Returns the result of instruction execution.

Example
The command below save waveform data in CSV format, path D:\123.csv.
:SAVE:CSV D:\123.csv
The command below save waveform data in TXT format, path D:\123.txt.
:SAVE:CSV D:\123.txt

:SAVE:IMAGe <file_spec>

Syntax
:SAVE:IMAGe<file_spec>

Description
Save waveform pictures in the specified file path.

Parameter

Name	Type	Range	Default Value
<file_spec>	ASCII String	Please refer to the instructions	--

Explanation
The parameter <file_spec> contains the file storage path and the suffix file name. If a file with the same name already exists in the specified path, the original file is overwritten. Supported suffix names include bmp, gif, png.

Return Format
Returns the result of instruction execution.

Example
The command below save the waveform image in BMP format. The path is D:\123.bmp.
:SAVE:IMAGe D:\123.bmp
The command below save the waveform image in PNG format. The path is D:\123.png.
:SAVE:IMAGe D:\123.png

:SAVE:IMAGe:INVert

Syntax
:SAVE:IMAGe:INVert <bool>
:SAVE:IMAGe:INVert?

Description
Turn on or off the anti color function during image storage, and query whether the anti color function is turned on during image storage.

Return format

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

Return format
The query returns "OFF" or "ON".

Example
The command below turns on the anti color function.
:SAVE:IMAGe:INVert ON
The query below returns "ON".
:SAVE:IMAGe:INVert?

:CURSor Command Subsystem

:CURSor:HORizontal:DISPlay

Syntax
:CURSor:HORizontal:DISPlay <bool>
:CURSor:HORizontal:DISPlay?

Description
Query and set the X-axis cursor switch.

Return format

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

Return format
The query returns "OFF" or "ON".

Example
The command below turns on the X-axis cursor.
:CURSor:HORizontal:DISPlay ON
The query below returns "ON".
:CURSor:HORizontal:DISPlay?

:CURSor:HORizontal:BAR

Syntax
:CURSor:HORizontal:BAR[n] <value>

:CURSor:HORizontal:BAR[n]?

Description
Query and set the position of the X-axis cursor.

Return format

Name	Type	Range	Default Value
[n]	Discrete	{1|2}	1
<value>	Integer	from 0 to 1000	

Return format
The query returns the position of the X-axis cursor in character string.

Example
The command below set the position of the X-axis cursor.
:CURSor:HORizontal:BAR1 500
The query below returns "500px".
:CURSor:HORizontal:BAR1?

:CURSor:VERTical:DISPlay

Syntax
:CURSor:VERTical:DISPlay <bool>
:CURSor:VERTical:DISPlay?

Description
Query and set the Y-axis cursor switch.

Return format

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

Return format
The query returns "OFF" or "ON".

Example
The command below turns on the Y-axis cursor.
:CURSor:VERTical:DISPlay ON
The query below returns "ON".
:CURSor:VERTical:DISPlay?

:CURSor:VERTical:BAR

Syntax
:CURSor:VERTical:BAR[n] <value>
:CURSor:VERTical:BAR[n]?

Description
Query and set the position of the Y-axis cursor.

Return format

Name	Type	Range	Default Value
[n]	Discrete	{1|2}	1
<value>	Integer	from 0 to 500	

Return format
The query returns the position of the Y-axis cursor in character string.

Example
The command below set the position of the Y-axis cursor.
:CURSor:HORizontal:BAR1 250
The query below returns "250px".
:CURSor:HORizontal:BAR1?

:CURSor:SOURce

Syntax
:CURSor:SOURce <source>
:CURSor:SOURce?

Description
Select the source under Mark Cursor.

Parameter

Name	Type	Range	Defaut Value
<source>	Discrete	{CH1|CH2|CH3|CH4 }	CH1

Return Format
For one-channel oscilloscope, the query returns "CH1".
For two-channel oscilloscope, the query returns "CH1" or "CH2".
For four-channel oscilloscope, the query returns "CH1", "CH2", "CH3" or "CH4".

Example
The command below selects "CH1" as the source under Mark Cursor.
:CURSor:SOURce CH1
The query below returns "CH1".
:CURSor:SOURce?

:CURSor:X[n]?

Syntax
:CURSor:X[n]?

Description
Query the value of the X-axis cursor.

Return format

Name	Type	Range	Default Value
[n]	Discrete	{1|2}	1

Return format
The query returns the value of the X-axis cursor in character string.

Example
The query below returns the value of cursor X1.
:CURSor:X1?

:CURSor:XDELta?

Syntax
:CURSor:XDELta?

Description
Query the difference between cursors X1 and X2.

Return format
The query returns the difference between cursors in character string.

Example
The query below returns the value of the difference between cursors.
:CURSor:XDELta?

:CURSor:IXDELta?

Syntax
:CURSor:IXDELta?

Description
Query the reciprocal of the absolute value of the difference between the cursors X1 and X2.

Return format
The query returns the value in character string.

Example
The query below returns the value.
:CURSor:IXDELta?

:CURSor:Y[n]?

Syntax
:CURSor:Y[n]?

Description
Query the value of the Y-axis cursor.

Return format

Name	Type	Range	Default Value
[n]	Discrete	{1|2}	1

Return format

The query returns the value of the Y-axis cursor in character string.

Example
The query below returns the value of cursor Y1 .
:CURSor:Y1?

:CURSor:YDELta?

Syntax
:CURSor:YDELta?

Description
Query the difference between cursors Y1 and Y2.

Return format
The query returns the difference between cursors in character string.

Example
The query below returns the value of the difference between cursors.
:CURSor:YDELta?