Hantek®

Programming manual

DPO6000, MPO6000 Series

Digital Phosphor Oscilloscope

(V 1.1)

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Contents

Copyright statement 2
Chapter 1 Programming Overview 9
Install IO software 9
Remote control method 11
Introduction to SCPI commands 11
Command format 11
Symbol Description 12
Parameter Type 12
Command abbreviation 13
Chapter 2 Command System 13
EEE488.2 Common Commands 13
*CLS 13
*ESE 13
*ESR? 14
*IDN? 14
*OPC 14
*RST 14
*SRE 14
*STB? 15
*TST? 15
*WAI 15
:AUToscale 15
:CLEar 15
:RUN 16
:STOP 16
:SINGle 16
:TFORce 16
:ACQuire Command Subsystem 16
:ACQuire:AVERages 16
:ACQuire:MDEPth 17
ACQuire:TYPE 17
:ACQuire:SRATe? 18
:CALibrate Command Subsystem 18
: CALibrate: QUIT 18
CALibrate: STARt 18
CHANnel <n> command subsystem 19
:CHANnel <n>:COUPling 19
:CHANnel<n>:DISPlay 20
:CHANnel<n>:INVert 20
:CHANnel<n>:OFFSet 20
:CHANnel<n>:RANGe 21
:CHANnel<n>:TCAL 21

:CHANnel<n>:SCALe 21
:CHANnel<n>:PROBe 22
:CHANnel<n>:VERNier 22
:CURSor Command Subsystem 23
:CURSor:MODE 23
:CURSor:MANual 23
:CURSor:TRACk 28
:DISPlay Command Subsystem 30
:DISPlay:CLEar 30
:DISPlay:TYPE 30
:DISPlay:GRADing:TIME 30
:DISPlay:WBRightness 31
:DISPlay:GRID 31
:DISPlay:GBRightness 31
:DECoder command subsystem 32
:DECoderMODE 32
:DECoder:DISPlay 32
:DECoder:POSition 32
:TABLE:MODE 33
:TABLE:DISPlay 33
:SEGMENTation command subsystem 33
:SEGMENTation:WRECord 33
:SEGMENTation:ENABle 34
:HISTORY Command Subsystem 34
:HISTory:WRECord: 34
:HORTory:WRECord:FINTerval 34
:HORTory:TABLE:ENABle 35
:HORTory:ENABle 35
: MATH command subsystem 35
:MATH:DISPlay 35
:MATH:OPERator 36
:MATH:SOURce1 36
:MATH:SOURce2 36
:MATH:SCALe 37
:MATH:OFFSet 37
:MATH:FFT:SOURce 38
:MATH:FFT:WINDow 38
:MATH:FFT:SPLit 38
: MATH: FFT: UNIT 39
:MATH:FFT:HSCale 39
:MATH:FFT:HCENter 40
:MASK command subsystem 40
:MASK:ENABle 40
:MASK:SOURce 40

:MASK:OPERate 41
:MASK:MDISplay 41
:MASK:SOOutput 41
:MASK:OUTPut 42
:MASK:X 42
:MASK:CREate 43
:MASK:PASSed? 43
:MASK:FAILed? 43
:MASK:TOTal? 43
:MASK:RESet 43
:MEASure Command subsystem 43
:MEASure:SOURce 43
:MEASure:COUNter: SOURce 44
:MEASure:COUNter: VALue? 44
:MEASure:CLEar 44
:MEASure:RECover 45
:MEASure:ADISplay 45
:MEASure:AMSource 46
:MEASure:SETup:PSA 46
:MEASure:SETup:PSB 46
:MEASure:SETup:DSA 47
MEASure:SETup:DSB 47
:MEASure:STATistic:DISPlay 47
:MEASure:STATistic:MODE 48
:MEASure:STATistic: RESet 48
:MEASure:STATistic:ITEM 48
: MEASure: ITEM 49
:SAVE Command Subsystem 50
:SAVE:TYPE: 50
:SAVE:SOURCE:EXTERnal 51
:SAVE:SOURCE:INTERnal 51
:RECALL command subsystem 51
:ERCALL:TYPE: 51
:REACLL:SOURCE:EXTERnal 51
:RECALL:SOURCE:INTERnal 52
:STORage Command Subsystem 52
: STORage: IMAGe: 52
:SYSTem Command Subsystem 52
:SYSTem:AUToscale 52
:SYSTem:BEEPer 0 53
:SYSTem:ERRor[:NEXT]? 0 53
:SYSTem:GAM? 53
:SYSTem:LANGuage 53
:SYSTem:LOCKed 54

SYSTem:PON 54
:SYSTem:OPTion:INSTall0 54
:SYSTem:OPTion:UNINSTall 54
:SYSTem:RAM? 54
:SYSTem:SETup0 55
SYSTem:DATE 55
SYSTem:TIME 56
SYSTem:COMMunicate 56
SYSTem:COMMunicate:<network>:AUTOip[:STATe] 56
SYSTem:COMMunicate:<network>:DHCP[:STATe] 56
SYSTem:COMMunicate:<network>:DNS 57
SYSTem:COMMunicate:<network>:GATEway 57
SYSTem:COMMunicate:<network>:IPADdress 57
SYSTem:COMMunicate:<network>:SMASk 58
SYSTem:COMMunicate:<network>:STATic[:STATe] 58
SYSTem: COMMunicate: <network>: MAC? 58
:SYSTem:COMMunicate:<network>:RX ? 59
SYSTem:COMMunicate:<network>:TX ? 59
SYSTem:COMMunicate:WLAN:HOTPot[:STATe] 59
SYSTem:COMMunicate:WLAN:HOTPot:KEYMgmt 60
:SYSTem: COMMunicate: WLAN: HOTPot: SSID 60
:SYSTem:COMMunicate:WLAN:HOTPot:PSK 60
:SYSTem:COMMunicate: WLAN: HOTPot: CHANnel 61
SYSTem: COMMunicate: WLAN: HOTPot: MAXStation 61
:SYSTem: COMMunicate: WLAN: HOTPot: DHCP: RANGe 61
SYSTem:COMMunicate:WLAN:HOTPot:STAtions? 62
SYSTem:COMMunicate:WLAN:NETWork:SCAN? 62
SYSTem:COMMunicate:WLAN:NETWork:LIST? 62
SYSTem:COMMunicate:WLAN:NETWork:ADD 62
SYSTem:COMMunicate:WLAN:NETWork:ENABle 63
SYSTem: COMMunicate: WLAN: NETWork: DISAble 63
SYSTem: COMMunicate: WLAN: NETWork: REMOve 63
:TIMebase Command Subsystem 63
:TIMebase:WINDow:ENABle 64
:TIMebase:WINDow:OFFSet 0 64
:TIMebase: WINDow: SCALe 64
:TIMebase [: MAIN]: OFFSet 65
:TIMebase [: MAIN]: SCALe 0 66
:TIMebase:MODE 66
:TRIGger Command Subsystem 67
:TRIGger:MODE 67
:TRIGger:STATus? 67
:TRIGger: SWEep 67
:TRIGger:HOLDoff 68

:TRIGger:POSition? 0 68
:TRIGger:EDGe 68
:TRIGger:PULSe 69
:TRIGger:SLOPe 71
:TRIGger:SLOPe:TIME0 72
:TRIGger:VIDeo 73
:TRIGger: TIMeout 76
:TRIGger:WINDows 77
TRIGger:INTERVAl 78
:TRIGger:RUNT 80
:TRIGger:DELay 82
:TRIGger:SHOLd 84
:TRIGger:PATTern 87
TRIGger:UART 88
:TRIGger:LIN 91
:TRIGger: CAN 94
:TRIGger:IIC 96
:TRIGger:SPI 100
: WAVeform command subsystem 102
:WAVeform:DATA:ALL? 102
:WAVeform:DATA:DISP? 104
:LA command subsystem 105
:LA:POD<n>:DISPlay 105
:LA:POD<n>:THReshold 105
[:SOURce[<n>]] command subsystem 106
[:SOURce[<n>]]:OUTPut[<n>][:STATe] 106
[:SOURce[<n>]]:OUTPut[<n>]:IMPedance 106
[:SOURce[<n>]]:FREQuency[:FIXed] 106
[:SOURce[<n>]]:PHASe[:ADJust] 107
[:SOURce[<n>]]:PHASe:INITiate 107
[:SOURce[<n>]]:FUNCtion[:SHAPe] 108
[:SOURce[<n>]]:FUNCtion:RAMP:SYMMetry 108
[:SOURce[<n>]]:VOLTage[:LEVel][:IMMediate][:AMPLitude] 109
[:SOURce[<n>]]:VOLTage[:LEVel][:IMMediate]:OFFSet 109
[:SOURce[<n>]]:PULSe:DCYCle 110
[:SOURce[<n>]]:MOD[:STATe] 110
[:SOURce[<n>]]:MOD:TYPe 111
[:SOURce[<n>]]:MOD:AM:INTernal:FREQuency 111
[:SOURce[<n>]]:MOD:FM:INTernal:FREQuency 111
[:SOURce[<n>]]:MOD:PM:INTernal:FREQuency 111
[:SOURce[<n>]]:MOD:PWM:INTernal:FREQuency 111
[:SOURce[<n>]]:MOD:AM:INTernal:FUNCtion 112
[:SOURce[<n>]]:MOD:FM:INTernal:FUNCtion 112
[:SOURce[<n>]]:MOD:AM[:DEPTh] 112

[:SOURce[<n>]]:MOD:FM[:DEVIation] 113
[:SOURce[<n>]]:MOD:PM[:DEVIation] 113
[:SOURce[<n>]]:MOD:PWM[:DEVIation] 114
[:SOURce[<n>]]:APPLy? 115
[:SOURce[<n>]]:BURST:CONT 115
[:SOURce[<n>]]:BURST:SOURE 115
[:SOURce[<n>]]:APPLy:NOISe 116
[:SOURce[<n>]]:APPLy:PULSe 116
[:SOURce[<n>]]:APPLy:RAMP 116
[:SOURce[<n>]]:APPLy:SINusoid 116
[:SOURce[<n>]]:APPLy:SQUare 116
[:SOURce[<n>]]:APPLy:USER 116
[:TRACe[<n>]]命令子系统 117
[:TRACe[<n>]]:DATA:DAC16 117
Chapter 3 Programming Examples 117
Programming preparation 118
Excel programming example 118
Matlab programming example 121
LabVIEW programming examples 124
Visual Basic programming example 130
Visual C++ programming examples 132

Chapter 1 Programming Overview

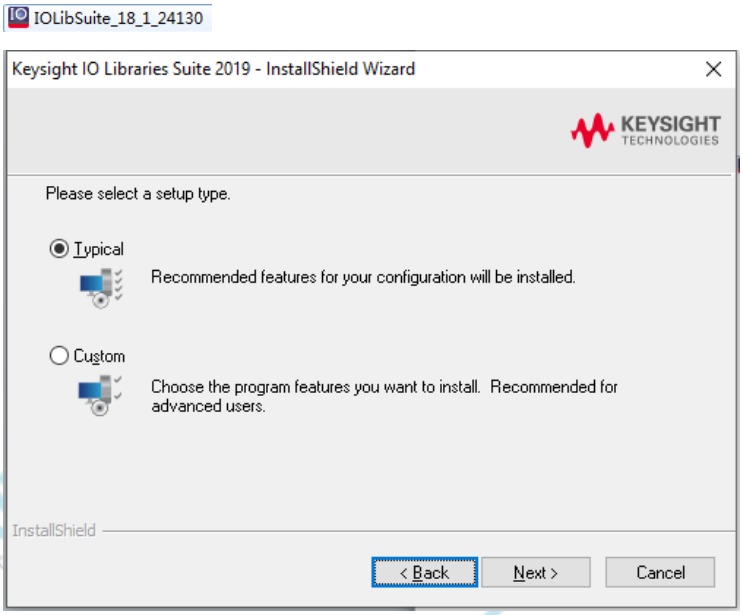
Install IO software

This oscilloscope can communicate with PC via USB, LAN, UART, WIFI instrument bus. The following will introduce how to use IO LibSuite software to remotely control the oscilloscope through USB interface.

Operation steps:

1. Install Keysight IO LibSuite software.

Log in to the keysight official website to download IO LibSuite software, and then follow the instructions to install.



2. Connect and configure the interface parameters of the instrument

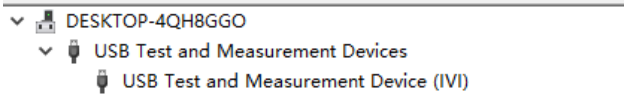
The DPO6000 / MPO6000 series can communicate with a PC via USB, LAN, UART, WIFI instrument bus. This manual uses USB as an example.

(1) Connect the device

Connect the USB Device interface on the rear panel of the oscilloscope to the USB Host interface of the computer using a USB data cable.

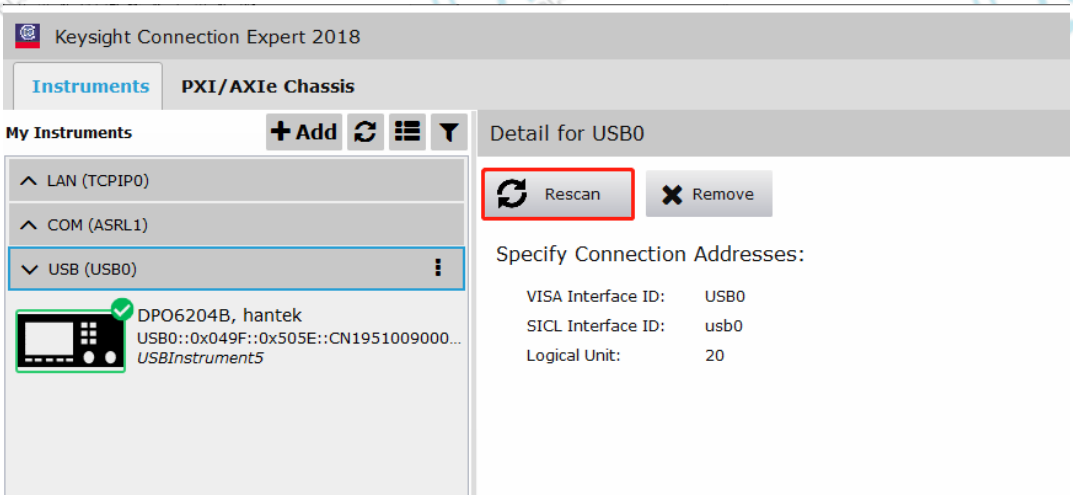
(2) Install the USB driver.

The PC will automatically install the oscilloscope driver [At the same time, the USB Device icon will be displayed on the oscilloscope]. Open the device manager to view the device as follows:



(3) Search for device resources

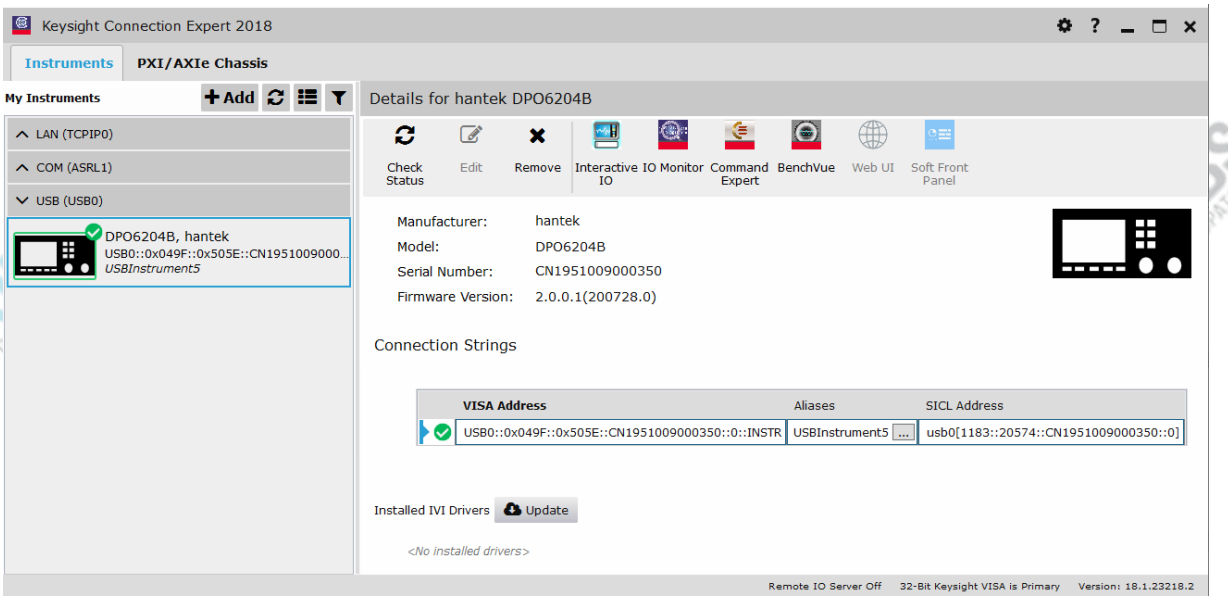
Open IO, the software will automatically search for the instrument resources currently connected to the PC via the USB interface. You can also click “Rescan” to search.



(4) View device resources

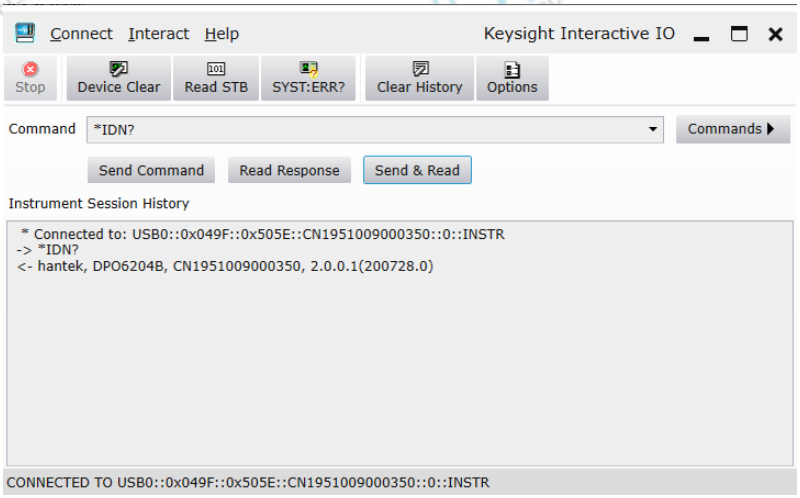
The searched resources will appear in the “USB” directory, and display the model and USB interface information of the instrument, as shown in the figure below.

For example: DPO6204B (USB0::0x049F::0x505E::CN1951009000350::0::INSTR).



(5) Remote control

Select DPO6204B (USB0::0x049F::0x505E::CN1951009000350::0::INSTR), open "Interactive IO", open the remote command control panel, you can send commands and read data through this panel.



Remote control method

1. User-defined programming

The user can program and control the oscilloscope through the standard SCPI (Standard Commands for Programmable Instruments) commands. For a detailed description of commands and programming, please refer to "Chapter 3 Programming Examples".

2. Send SCPI commands using PC software

Users can use PC software to send commands to remotely control the oscilloscope. It is recommended to use the IO software provided by Keysight.

Introduction to SCPI commands

SCPI (abbreviation of Standard Commands for Programmable Instruments), that is, the standard command set of programmable instruments (programmable instruments). SCPI is a standardized instrument based on the existing standards IEEE 488.1 and IEEE 488.2, and following the floating-point arithmetic rules of the IEEE 754 standard, ISO 646 information exchange 7-bit coded symbols (equivalent to ASCII programming) and other standards Programming language. SCPI commands are tree-like hierarchies, including multiple subsystems, and each subsystem consists of a root keyword and one or more hierarchical keywords.

Command format

Commands usually begin with a colon ":". Keywords are separated by a colon ":", and keywords are followed by optional parameter settings. A question mark "?" is added after the command line to indicate that this function is being queried. The command keyword and the first parameter are separated by a space.

For example:

:ACQuire:TYPE <type>

:ACQuire:TYPE?

ACQuire is the root keyword of the command, and TYPE is the second-level keyword. The command line starts with a colon ":", and the keywords of each level are separated with a colon ":". <Type> indicates a parameter that can be set. The question mark "?" Indicates a query. Command keyword: ACQuire: TYPE and parameter <type> are separated by spaces.

In some commands with parameters, multiple parameters are usually separated by a comma ",",

for example:
[:TRACe[<n>]]:DATA:VALue volatile,<points>,<data>

Symbol Description

The following symbols are not sent with the command.

1. Braces {}

The contents of the braces are parameter options. Parameter items are usually separated by a vertical bar "|". When using a command, you must select one of the parameters.

2. Vertical bar |

Vertical bar is used to separate multiple parameter options. One of the parameters must be selected when using the command.

3. Square brackets []

The content in square brackets is omissible.

4. Triangle brackets <>

The parameters in the triangle brackets must be replaced with a valid value.

Parameter Type

1. Bool

The parameter value is on, off, 1 or 0.

For example:

:MEASure:ADISplay <bool>

:MEASure:ADISplay?

Where: <bool> can be set to: {{1|ON}|{0|OFF}}.

The query returns 1 or 0.

2. Discrete

The Discrete parameter takes the listed options.

For example:

:ACQuire:TYPE <Vaule>

:ACQuire:TYPE?

Where:

<Value>can be set to: NORMal|AVERages|PEAK|HRESolution.

The query returns the abbreviated form: NORMal, AVERages, PEAK or HRESolution.

3. Integer

Unless otherwise stated, parameters can be any integer (NR1 format) within the valid value range.

Note that at this time, please do not set the parameter to decimal format, otherwise an exception will occur.

For example:

:DISPlay:GBRightness < brightness >

:DISPlay:GBRightness?

Where: < brightness > can be set to an integer between 0 and 100. The query returns an integer between 0 and 100.

4. Real

The parameter can be any real number within the valid value range. This command accepts

parameter input in decimal (NR2 format) and scientific (NR3 format) format.

For example:

:TRIGger:TIMeout:TIMe <NR3>

:TRIGger:TIMeout:TIMe?

Where: <NR3> can be set to: Real number between 1.6e-08 (i.e. 16ns) and 1e + 01 (i.e. 10s). The query returns a real number in scientific notation.

5. ASCII String

The parameter value is a combination of ASCII characters.

For example:

:SYSTem:OPTion:INSTall <license>

Where: <license> can be set to: PDUY9N9QTS9PQSWPLAETRD3UJHYA

Command abbreviation

All commands are not case sensitive, you can use all uppercase or lowercase. But if you want to abbreviate, you must enter all capital letters in the command format.

For example:

:MEASure:ADISplay? Can be abbreviated to :MEAS:ADIS?

Chapter 2 Command System

EEE488.2 Common Commands

IEEE488.2 general commands are used to query the basic information of the instrument or perform common basic operations. These commands usually start with "*", and the length of the command keyword is 3 characters.

*CLS

Command format	*CLS
Function description	Clears all event registers to zero and clears the error queue.

For example,

*CLS 16 /*Enable bit 4 (16 decimal) of the register */

*ESE

Command format	*ESE <value> *ESE?			
Function description	Sets or queries the enable register value of the standard event status register group.			
Parameter	Name	Type	Range	Default
	<value>	Integer	Refer to the description	0
Return format	The query returns an integer equal to the sum of the weights of all the bits set in this register.			

For example,

*ESE 0 /*Enable bit 0 of the register*/

*ESE? /*Query the enable value of the return register 0*/

*ESR?

Command format	*ESR?
Function description	Query and clear the event register value of the standard event status register group.
Return format	The query returns an integer equal to the sum of the weights of all bits in the register.

For example,

*ESR? /*Query the enable value of the return register 0*/

*IDN?

Command format	*IDN?
Function description	Query the ID string of the instrument.
Return format	The query returns HANTEK, <model>, <serial number>, <software version>. among them, <model>: instrument model; <serial number>: instrument serial number; <Software version>: Instrument software version.

For example,

*IDN? /*ODM, DPO6204C, test1122334455, 2.0.0.1(181229.0)*/

*OPC

Command format	*OPC?
Function description	The *OPC command is used to set the Operation Complete bit (bit 0) of the standard event status register to 1 after the current operation is completed. *OPC? Command is used to query whether the current operation is completed.
Return format	Returns 1 if the current operation is completed, otherwise returns 0.

*RST

Command format	*RST
Function description	Restore the instrument to the factory default state.

*SRE

Command format	*SRE <value> *SRE?			
Function description	Sets or queries the enable register value of the status byte register group.			
Parameter	Name	Type	Range	Default
	<value>	Integer	0 to 255	0
Return format	The query returns an integer equal to the sum of the weights of all the bits set in this register.			

For example,

*SRE 0 /*Enable register bit 4 (16 decimal)*/

*SRE? /*Query the enable value of the return register 16*/

*STB?

Command format	*STB?
Function description	Query the event register value of the status byte register. After the command is executed, the value of the status byte register is cleared.
Return format	The query returns an integer equal to the sum of the weights of all bits in the register.

*TST?

Command format	*TST?
Function description	Perform a self-test and return the self-test results.
Return format	The query returns a decimal integer.

*WAI

Command format	*WAI
Function description	Wait for the operation to complete.
Description	Subsequent commands can be executed after the current operation command has been executed.

:AUToscale

Command format	:AUToscale
Function description	Enable the automatic waveform setting function. The oscilloscope will automatically adjust the vertical scale, horizontal time base, and trigger mode according to the input signal to achieve the best waveform display. This command is equivalent to pressing the front panel **AUTO Scale** button.
Description	▹When applying the automatic waveform setting function, the theoretical frequency of the sine signal is not less than 10Hz; for the square wave signal, the theoretical value is related to the duty cycle, the duty cycle should be greater than 0.5%, and the amplitude should be at least 10mVpp (the probe ratio is 1X Time). ▹When the current status of the pass / fail function is to allow the test, if you send this command, the oscilloscope first turns off the pass / fail function, and then executes the automatic waveform setting function. ▹This command is invalid when the segment acquisition function is turned on or the history waveform is turned on.

For example,

:AUToscale /*The oscilloscope performs the AUTO function*/

:CLEar

Command format	:CLEar
Function description	Clear all waveforms on the screen. If the oscilloscope is in the RUN state, the waveform will continue to be displayed.

For example,

: CLEar / * Clear all waveforms on the screen * /

:RUN

:STOP

Command format	:RUN :STOP
Function description	: RUN starts the oscilloscope. : STOP command stops the oscilloscope. This command is equivalent to pressing the **RUN/STOP** button on the front panel.
Description	This command is invalid when the waveform recording function is turned on or when the recorded waveform is played back.

For example,

:RUN /*The oscilloscope starts to run*/

:STOP /*The oscilloscope stops running*/

:SINGle

Command format	:SINGle
Function description	Set the oscilloscope to single trigger mode. This command is equivalent to pressing the **SINGLE** button on the front panel.
Description	▷In single trigger mode, the oscilloscope will trigger once when the trigger conditions are met, and then stop. ▷This command is invalid when the waveform recording function is turned on or when the recorded waveform is played back.

For example,

:SINGle / *Single acquisition of oscilloscope*/

:TFORce

Command format	:TFORce
Function description	Force a trigger signal. Suitable for normal and single trigger mode. This command has the same function as pressing the front panel trigger control area For **ForceTrig** key.

For example,

:TFORce / *Forced oscilloscope triggering*/

:ACQuire Command Subsystem

The :ACQuire command is used to set and query the oscilloscope's storage depth, acquisition method and average number of samples, and query the current sampling rate.

:ACQuire:AVERages

Command format	:ACQuire:AVERages <Vaule> :ACQuire:AVERages?			
Function description	Set or query the average number of times in the average acquisition mode			
Parameter	Name	Type	Range	Default
	<Vaule>	integer	2^n(n is an integer, ranging from 1 to 10)	2

Description	▷You can send the: ACQuire: TYPE command to set the acquisition method. ▷In the average acquisition mode, the higher the number of averages, the smaller the collected waveform noise and the higher the vertical resolution, but the slower the response of the displayed waveform to the waveform changes.
Return format	The query returns an integer between 2 and 1024.

For example,

:ACQuire:AVERages 64 /*Set the average number to 64*/

:ACQuire:AVERages? /*The query returns 64*/

:ACQuire:MDEPth

Command format	:ACQuire:MDEPth <mdep> :ACQuire:MDEPth?			
Function description	Set or query the storage depth of the oscilloscope (that is, the number of waveform points that can be stored in a triggered acquisition). The default unit is pts (points).			
Parameter	Name	Type	Range	Default
	<mdep>	Discrete	refer to description	AUTO
Description	For analog channels: ▷Single channel open, the range of <mdep> is {AUTO|32,000|320,000|3,200,000|32,000,000|64,000,000|128,000,000}. ▷When dual channel is on, the range of <mdep> is {AUTO|16,000|160,000|1,600,000|16,000,000|32,000,000|64,000,000}. ▷When three or four channels are on, the range of <mdep> is {AUTO|8,000|80,000|800,000|8,000,000|16,000,000|32,000,000}. Memory depth, the relationship between the sampling rate and waveform length satisfies the following formula: Memory depth = sample rate × wave length When selecting AUTO, the oscilloscope automatically selected memory depth based on the current sampling rate.			
Return format	The query returns the actual number of points (integer) or AUTO.			

For example,

:ACQuire: MDEPth 32000 /*Set storage depth to 32000pts*/

:ACQuire: MDEPth? /*The query returns 32000*/

ACQuire:TYPE

Command format	:ACQuire:TYPE <Value> :ACQuire:TYPE?			
Function description	Set or query the acquisition method of oscilloscope samples			
Parameter	Name	Type	Range	Default
	<Value>	Discrete	{NORMal|AVERages|PEAK|HRESolution}	NORMal
Description	▷NORMal (normal): In this mode, the oscilloscope samples the signal at equal time intervals to reconstruct the waveform. For most waveforms, using this mode produces the best display results. ▷AVERages: In this mode, the oscilloscope averages waveforms that have been			

	sampled multiple times to reduce random noise on the input signal and improve vertical resolution. The number of averages can be set by the: ACQuire: AVERages command. The higher the number of averages, the lower the noise and the higher the vertical resolution, but the slower the response of the displayed waveform to waveform changes. ▷PEAK (Peak Detection): In this mode, the oscilloscope collects the maximum and minimum values of the sampling interval signal to obtain the signal envelope or narrow pulses that may be lost. Using this mode can avoid aliasing of the signal, but the display noise is relatively large. ▷HRESolution (high resolution): This mode uses an oversampling technique to average the neighboring points of the sampled waveform to reduce random noise on the input signal and produce a smoother waveform on the screen. It is usually used when the sampling rate of the digitizer is higher than the storage rate of the acquisition memory.
Return format	The query returns NORM, AVERage, PEAK, or HRESolution.

For example,

:ACQuire:TYPE AVERages /*Set the acquisition method to average*/

:ACQuire:TYPE?/*The query returns AVERage*/

:ACQuire:SRATe?

Command format	:ACQuire:SRATe?
Function description	Query the current sampling rate. The default unit is Sa/s.
Parameter	The sampling rate refers to the frequency at which the oscilloscope samples the signal, that is, the number of waveform points sampled per second. The relationship between the sampling rate, memory depth, and waveform length satisfies the following formula: Memory depth = sample rate × waveform length
Return format	The query returns the sample rate as a real number.

For example,

:ACQuire:SRATe? /*The query returns 2,500,000 2.5M sampling rate*/

:CALibrate Command Subsystem

: CALibrate: QUIT

Command format	:CALibrate:QUIT
Function description	Abandon the self-calibration operation at any time.

For example,

:CALibrate:QUIT /*Exit self-calibration*/

CALibrate: STARt

Command format	:CALibrate:STARt
Function description	The oscilloscope starts performing a self-calibration operation.
Description	▷ Self-calibration operation can quickly make the oscilloscope reach the best working condition to obtain the most accurate measurement value.

	▷ Before performing a self-calibration, make sure that no signals are connected to all channels until the self-calibration operation ends. ▷ During the self-calibration process, most of the key functions have been disabled.
Return format	Returns the status of the current calibration.

For example,

:CALibrate:STARt /*Scope calibration*/

CHANnel <n> command subsystem

:CHANnel <n> The command is used to set or query the vertical system parameters such as the bandwidth limit, coupling, vertical scale, and vertical offset of the analog channel.

:CHANnel<n>:BWLimit

Command format	:CHANnel<n>:BWLimit <type> :CHANnel<n>:BWLimit?			
Function description	Set or query the bandwidth limit parameters of the specified channel.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<type>	Bool	{{1|ON}|{0|OFF}}	OFF
Description	OFF: Turn off the bandwidth limitation, and the high-frequency components contained in the measured signal can pass. ON: Turn on the bandwidth limitation, and the high-frequency components contained in the signal under test are attenuated. Turning on bandwidth limiting reduces waveform noise, but attenuates high-frequency components.			
Return format	The query returns ON or OFF.			

For example,

: CHANnel1:BWLimit 1 /*Enable 20MHz bandwidth limit*/

:CHANnel1:BWLimit? /*The query returns 1*/

:CHANnel <n>:COUPling

Command format	:CHANnel<n>:COUPling<coupling> :CHANnel<n>:COUPling?			
Function description	Set or query the coupling mode of the specified channel.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<coupling>	Discrete	{AC|DC|GND}	DC
Description	AC: The DC component of the signal under test is blocked. DC: Both the DC and AC components of the signal under test can pass. GND: Both the DC and AC components of the signal under test are blocked			
Return format	The query returns AC, DC or GND.			

For example,

:CHANnel1:COUPling AC /*Select AC coupling method*/

:CHANnel1:COUPling? /*Query returns AC*/

:CHANnel<n>:DISPlay

Command format	:CHANnel<n>:DISPlay <bool> :CHANnel<n>:DISPlay?			
Function description	Open or close the specified channel or query the switch status of the specified channel.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<bool>	Bool	{{1|ON}|{0|OFF}}	CH1：1|ON CH2 to CH4：0|OFF
Description	The query returns 1 or 0.			

For example,

:CHANnel1:DISPlay ON /*Turn on CH1*/

:CHANnel1:DISPlay? /*The query returns 1*/

:CHANnel<n>:INVert

Command format	:CHANnel<n>:INVert <bool> :CHANnel<n>:INVert?			
Function description	Turn the waveform inversion of the specified channel on or off or query the switching status of the waveform inversion of the specified channel.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	When the waveform inversion is turned off, the waveform is displayed normally; when the waveform inversion is turned on, the waveform voltage value is inverted.			
Return format	The query returns 1 or 0.			

For example,

:CHANnel1:INVert ON /*Turn on the waveform inversion of CH1*/

:CHANnel1:INVert? /*The query returns 1*/

:CHANnel<n>:OFFSet

Command format	:CHANnel<n>:OFFSet <offset> :CHANnel<n>:OFFSet?			
Function description	Sets or queries the vertical displacement of the specified channel. The default unit is V.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<offset>	Real type	related to vertical scale and probe ratio When the probe ratio is 1X, Vertical scale> 1.28V / div: -50V to + 50V Vertical scale <1.28V / div: -10V to + 10V Vertical scale <128mV / div: -1V to + 1V	0V (probe ratio is 1X)
Description	The set vertical displacement value is affected by the vertical gear and probe ratio. The range of legal values varies with the vertical scale and probe ratio. If			

	you set an offset outside the legal range, the offset value will be automatically set to the closest legal value.
Return format	The query returns the vertical displacement value in scientific notation.

For example,

:CHANnel1:OFFSet 1V /*Set the vertical offset of CH1 to 1V*/

:CHANnel1:OFFSet? /*The query returns 1*/

:CHANnel<n>:RANGe

Command format	:CHANnel<n>:RANGe <range> :CHANnel<n>:RANGe?			
Function description	Sets or queries the vertical displacement of the specified channel. The default unit is V.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<range>	Real type	Related to probe ratio Probe ratio is 1X: 5mV to 100V	10V (probe ratio is 1X)
Description	This command indirectly modifies the vertical scale of the specified channel (vertical scale = vertical range / 10).			
Return format	The query returns the vertical range value in scientific notation.			

For example,

:CHANnel1:RANGe 1V /*Set the vertical range of CH1 to 1V*/

:CHANnel1:RANGe? /*The query returns 1.000e + 00*/

:CHANnel<n>:TCAL

Command format	:CHANnel<n>:TCAL <val> :CHANnel<n>:TCAL?			
Function description	Set or query the delay correction time of the specified channel. It is used to correct the zero offset of the corresponding channel. The default unit is s.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<val>	Real type	-100ns to 100ns	0.00s
Description	If the parameter sent is not a configurable value, the nearest value is automatically taken.			
Return format	The query returns the delay correction time value in scientific notation.			

For example,

:CHANnel1:TCAL 0.00000002 /*Set the delay correction time to 20ns*/

:CHANnel1:TCAL? /*The query returns 2.000000e-08*/

:CHANnel<n>:SCALe

Command format	:CHANnel<n>:SCALe <scale> :CHANnel<n>:SCALe?			
Function description	Sets or queries the vertical scale of the specified channel. The default unit is V.			
Parameter	Name	Type	Range	Default

	<n>	Discrete	{1|2|3|4}	——
	<scale>	Real type	Related to probe ratio Probe ratio is 1X: 500uV to 10V	1V (probe ratio is 10X)
Description	▹The settable range of the vertical scale is related to the currently set probe ratio (set by the: CHANnel <n>: PROBe command). ▹You can use the: CHANnel <n>: VERNier command to turn on or off the fine-tuning setting for the vertical scale of the specified channel. The trim setting is turned off by default. At this time, you can only set the vertical scale in 1-2-5 steps, that is, 500uV, 1mV, 2mV, 5mV, 10mV ... 10V (probe ratio is 1X). When the trim setting is on, you can further adjust the vertical scale within a smaller range to improve vertical resolution. If the amplitude of the input waveform is slightly larger than the full scale in the current scale, and the amplitude displayed by the waveform of the next gear is slightly lower, you can use fine adjustment to improve the waveform display amplitude to facilitate observation of signal details.			
Return format	The query returns the vertical scale value in scientific notation.			

For example

:CHANnel1:SCALe 1 /*Set the vertical scale of CH1 to 1V*/

:CHANnel1:SCALe? /*The query returns 1.000e + 00*/

:CHANnel<n>:PROBe

Command format	:CHANnel<n>:PROBe <atten> :CHANnel<n>:PROBe?			
Function description	Set or query the probe ratio of the specified channel.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<atten>	Discrete	{1|10|100|1000}	1
Description	▹Set the probe ratio, which is displayed after multiplying the acquired signal by a specified multiple (does not affect the actual amplitude of the signal). ▹Setting the probe ratio affects the settable range of the current vertical scale.			
Return format	The query returns the probe attenuation ratio in scientific notation.			

For example,

:CHANnel1:PROBe 10 /*Set the probe attenuation ratio of CH1 to 10X*/

:CHANnel1:PROBe? /*The query returns 1.000000e + 01*/

:CHANnel<n>:VERNier

Command format	:CHANnel<n>:VERNier <bool> :CHANnel<n>:VERNier?			
Function description	Turn the fine adjustment function of the vertical scale of the specified channel on or off, or query the status of the fine adjustment function of the vertical scale of the specified channel.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF

Description	The trim setting is off by default. At this time, you can only set the vertical scale in 1-2-5 steps, that is, 500u, 1mV, 2mV, 5mV, 10mV ... 10V (probe ratio is 1X). When the trim setting is on, you can further adjust the vertical scale within a smaller range to improve vertical resolution. If the amplitude of the input waveform is slightly larger than the full scale in the current scale, and the amplitude displayed by the waveform of the next gear is slightly lower, you can use fine adjustment to improve the waveform display amplitude to facilitate observation of signal details.
Return format	The query returns 1 or 0.

For example,

:CHANnel1:VERNier ON /*Turn on the fine adjustment function of CH1 vertical scale*/

:CHANnel1:VERNier? /*The query returns 1*/

:CURSor Command Subsystem

:CURSor command is used to measure the X-axis value (such as time) and Y-axis value (such as voltage) of the screen waveform.

:CURSor:MODE

Command format	:CURSor:MODE <mode> :CURSor:MODE?			
Function description	Set or query the cursor measurement mode.			
Parameter	Name	Type	Range	Default
	<mode>	Discrete	{OFF|MANual|TRACk }	OFF
Description	OFF: Turn off the cursor measurement function. MANual: Turn on the manual cursor measurement mode. TRACk: Turn on the cursor tracking measurement mode.			
Return format	The query returns OFF, MAN, TRAC, AUTO, or XY.			

For example,

:CURSor:MODE MANual /*Select manual cursor measurement mode*/

:CURSor:MODE? /*The query returns MAN*/

:CURSor:MANual

:CURSor:MANual: TYPE

Command format	:CURSor:MANual:TYPE <type> :CURSor:MANual:TYPE?			
Function description	Set or query the cursor type for manual cursor measurement.			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{X|Y }	X
Description	▹ X: Select X type cursor. The X-shaped cursor is a vertical solid line (Cursor A) and a vertical dotted line (Cursor B). It is usually used to measure time parameters. ▹ Y: Select the Y cursor. The Y cursor is a horizontal solid line (Cursor A) and a horizontal dotted line (Cursor B). It is usually used to measure voltage			

	parameters.
Return format	The query returns X or Y.

For example,

:CURSor:MANual:TYPE X /*Select X type cursor*/

:CURSor:MANual:TYPE? /*The query returns X*/

:CURSor:MANual:SOURce

Command format	:CURSor:MANual:SOURce <source> :CURSor:MANual:SOURce?			
Function description	Set or query the channel source for manual cursor measurement.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4|MATH|LA}	CHANnel1
Description	▹Only the currently opened channel can be selected as the channel source. ▹When LA is selected, the cursor type cannot be set to Y (: CURSor: MANual: TYPE).			
Return format	The query returns CHAN1, CHAN2, CHAN3, CHAN4, MATH, or LA.			

For example,

:CURSor:MANual:SOURce CHANnel2 /*Set the channel source to CH2*/

:CURSor:MANual:SOURce? /*The query returns CHAN2*/

:CURSor:MANual:TUNit0

Command format	:CURSor:MANual:TUNit <unit> :CURSor:MANual:TUNit?			
Function description	Sets or queries the horizontal unit in the manual cursor measurement mode.			
Parameter	Name	Type	Range	Default
	<unit>	Discrete	{S|HZ|DEGRee|PERCent}	S
Description	▹S: AX, BX, and BX-AX in the measurement results are in seconds, and 1 / | dX | is in hertz. ▹HZ: AX, BX, and BX-AX in the measurement result are in "Hertz", 1 / | dX | is in "Seconds". ▹DEGRee: AX, BX and BX-AX in the measurement results are in "degrees". ▹PERCent: AX, BX and BX-AX in the measurement results are expressed in percentage format.			
Return format	The query returns S, HZ, DEGR, or PERC.			

For example,

:CURSor:MANual:TUNit DEGRee /*Set the horizontal unit to "degree"*/

:CURSor:MANual:TUNit? /*The query returns DEGR*/

:CURSor:MANual:VUNit0

Command format	:CURSor:MANual:VUNit <unit> :CURSor:MANual:VUNit?			
Function description	Sets or queries the vertical unit in manual cursor measurement mode.			
Parameter	Name	Type	Range	Default
	<unit>	Discrete	{PERCent|SOURce}	SOURce

Description	▷PERCent: AY, BY and BY-AY in the measurement results are expressed in percentage format. ▷SOURce: The units of AY, BY and BY-AY in the measurement result are automatically set to the units of the current source.
Return format	The query returns PERC or SOUR.

For example,

:CURSor:MANual:VUNit PERCent /*Set AY, BY, and BY-AY in the measurement result in percentage format */

:CURSor:MANual:VUNit? /*The query returns PERC*/

:CURSor:MANual:AX

Command format	:CURSor:MANual:AX <x> :CURSor:MANual:AX?			
Function description	Set or query the horizontal position of cursor A when manual cursor measurement is performed.			
Parameter	Name	Type	Range	Default
	<x>	Integer	0 to 770	100
Description	The horizontal and vertical positions of the cursor are defined by the pixel coordinates of the screen. The pixel coordinates of the screen range from (0,0) to (770,400). Among them, (0, 0) is the upper left corner of the screen, and (770,400) is the lower right corner of the screen. The pixel range in the horizontal direction is 0 to 770, and the pixel range in the vertical direction is 0 to 400.			
Return format	The query returns an integer between 0 and 770.			

For example,

:CURSor:MANual:AX 200 /*Set the horizontal position of cursor A to 200*/

:CURSor:MANual:AX? /*The query returns 200*/

:CURSor:MANual:BX

Command format	:CURSor:MANual:BX <x> :CURSor:MANual:BX?			
Function description	Set or query the horizontal position of cursor B when manual cursor measurement is performed.			
Parameter	Name	Type	Range	Default
	<x>	Integer	0 to 770	500
Description	The horizontal and vertical positions of the cursor are defined by the pixel coordinates of the screen. The pixel coordinates of the screen range from (0,0) to (770,400). Among them, (0,0) is the upper left corner of the screen, and (770,400) is the lower right corner of the screen. The pixel range in the horizontal direction is 0 to 770, and the pixel range in the vertical direction is 0 to 400.			
Return format	The query returns an integer between 5 and 594.			

For example,

:CURSor:MANual:BX 200 /*Set the horizontal position of cursor B to 200*/

:CURSor:MANual:BX? /*The query returns 200*/

:CURSor:MANual:AY

Command format	:CURSor:MANual:AY <y> :CURSor:MANual:AY?			
Function description	Set or query the vertical position of cursor A when manual cursor measurement.			
Parameter	Name	Type	Range	Default
	<y>	Integer	0 to 400	100
Description	▷The horizontal and vertical positions of the cursor are defined by the pixel coordinates of the screen. The pixel coordinates of the screen range from (0, 0) to (770,400). Among them, (0, 0) is the upper left corner of the screen, and (770,400) is the lower right corner of the screen. The pixel range in the horizontal direction is 0 to 770, and the pixel range in the vertical direction is 0 to 400. ▷When selecting LA for the source of manual cursor measurement, there is no need to use the Y cursor.			
Return format	The query returns an integer between 0 and 400.			

For example,

:CURSor:MANual:AY 200 /*Set the vertical position of cursor A to 200*/

:CURSor:MANual:AY? /*The query returns 200*/

:CURSor:MANual:BY

Command format	:CURSor:MANual:BY <y> :CURSor:MANual:BY?			
Function description	Set or query the vertical position of cursor B when manual cursor measurement is performed.			
Parameter	Name	Type	Range	Default
	<y>	Integer	0 to 400	300
Description	▷The horizontal and vertical positions of the cursor are defined by the pixel coordinates of the screen. The pixel coordinates of the screen range from (0, 0) to (770,400). Among them, (0, 0) is the upper left corner of the screen, and (770,400) is the lower right corner of the screen. The pixel range in the horizontal direction is 0 to 770, and the pixel range in the vertical direction is 0 to 400. ▷ When selecting LA for the source of manual cursor measurement, there is no need to use the Y cursor.			
Return format	The query returns an integer between 0 and 400.			

For example,

:CURSor:MANual:BY 200 /*Set the vertical position of cursor B to 200*/

:CURSor:MANual:BY? /*The query returns 200*/

:CURSor:MANual:AXValue?

Command format	:CURSor:MANual:AXValue?
Function description	Query the X value at cursor A during manual cursor measurement. The unit is determined by the currently selected horizontal unit.

Return format	The query returns the X value at the current cursor A in scientific notation.

For example,

:CURSor:MANual:AXValue? /*The query returns -4.000000e-06*/

:CURSor:MANual:AYValue?

Command format	:CURSor:MANual:AYValue?
Function description	Query the Y value at cursor A during manual cursor measurement. The unit is determined by the currently selected vertical unit.
Return format	▹When the source selects CHANnel1 | CHANnel2 | CHANnel3 | CHANnel4 | MATH, the query returns the Y value at the current cursor A in scientific notation. ▹When the source selects LA, the query returns the binary weighted sum of the D15 to D0 bits at the current cursor A at the current system as an integer (the unopened channel defaults to 0).

For example,

:CURSor:MANual:AYValue? /*The query returns 2.000000e + 00*/

:CURSor:MANual:BXValue?

Command format	:CURSor:MANual:BXValue?
Function description	When querying the manual cursor measurement, the X value at cursor B. The unit is determined by the currently selected horizontal unit.
Return format	The query returns the X value at the current cursor B in scientific notation.

For example,

:CURSor:MANual: BXValue? /*The query returns 4.000000e-06*/

:CURSor:MANual:BYValue?

Command format	:CURSor:MANual:BYValue?
Function description	Query the Y value at cursor B during manual cursor measurement. The unit is determined by the currently selected vertical unit.
Return format	▹When the source selects CHANnel1 | CHANnel2 | CHANnel3 | CHANnel4 | MATH, the query returns the Y value at the current cursor B in scientific notation. ▹When the source selects LA, the query returns the binary weighted sum of the D15 to D0 bits at the current cursor B at the current decimal point as an integer (the unopened channel defaults to 0).

For example,

:CURSor:MANual:BYValue? /*The query returns -2.000000e + 00*/

:CURSor:MANual:XDELta?

Command format	:CURSor:MANual:XDELta?
Function description	Query the difference BX-AX between the X value at cursor A and B at the time of manual cursor measurement. The unit is determined by the currently selected horizontal unit.
Return format	The query returns the current difference in scientific notation.

For example,
:CURSor:MANual:XDELta? /*The query returns 8.00000e-06*/

:CURSor:MANual:IXDELta?

Command format	:CURSor:MANual:IXDELta?
Function description	When inquiring manual cursor measurement, the inverse of the absolute value of the difference between the X values at cursor A and cursor B is 1 / | dX |. The unit is determined by the currently selected horizontal unit.
Return format	The query returns 1 / | dX | in scientific notation.

For example,
:CURSor:MANual:IXDELta? /*The query returns 1.25000e + 05*/

:CURSor:MANual:YDELta?

Command format	:CURSor:MANual:YDELta?
Function description	When querying the manual cursor measurement, the difference between the Y values at cursor A and B is BY-AY. The unit is determined by the currently selected vertical unit.
Return format	When the source selects CHANnel1 | CHANnel2 | CHANnel3 | CHANnel4 | MATH, the query returns the current difference in scientific notation; when the source selects LA, it returns the integer 4294967295.

For example,
:CURSor:MANual:YDELta? /*The query returns -4.000000e + 00*/

:CURSor:TRACk

:CURSor:TRACk:SOURcea

Command format	:CURSor:TRACk:SOURce1 <source> :CURSor:TRACk:SOURce1?			
Function description	Set or query the channel source of cursor A measurement during cursor tracking measurement.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{OFF|CHANnel1|CHANnel2|CHANnel3|CHANnel4|MATH}	CHANnel1
Description	You can only select an open channel as the channel source.			
Return format	The query returns OFF, CHAN1, CHAN2, CHAN3, CHAN4, or MATH.			

For example,
:CURSor:TRACk:SOURce1 CHANnel2 /*Set the channel source to CH2*/
:CURSor:TRACk:SOURce1? /*The query returns CHAN2*/

:CURSor:TRACk:SOURceb

Command format	:CURSor:TRACk:SOURce2 <source> :CURSor:TRACk:SOURce2?
Function description	Set or query the channel source of cursor B measurement during cursor tracking measurement.

Parameter	Name	Type	Range	Default
	<source>	Discrete	{OFF|CHANnel1|CHANnel2|CHANnel3|CHANnel4|MATH}	CHANnel1
Description	You can only select an open channel as the channel source.			
Return format	The query returns OFF, CHAN1, CHAN2, CHAN3, CHAN4, or MATH.			

For example,

:CURSor:TRACk:SOURce2 CHANnel2 /*Set the channel source to CH2*/

:CURSor:TRACk:SOURce2? /*The query returns CHAN2*/

:CURSor:TRACk:AX

Command format	:CURSor:TRACk:AX <x> :CURSor:TRACk:AX?			
Function description	Set or query the horizontal position of cursor A when cursor tracking measurement.			
Parameter	Name	Type	Range	Default
	<x>	Integer	0 to 770	100
Description	The horizontal and vertical positions of the cursor are defined by the pixel coordinates of the screen. The pixel coordinates of the screen range from (0,0) to (770,400). Among them, (0,0) is the upper left corner of the screen, and (770,400) is the lower right corner of the screen. The pixel range in the horizontal direction is 0 to 770, and the pixel range in the vertical direction is 0 to 400.			
Return format	The query returns an integer between 0 and 770.			

For example,

:CURSor:TRACk:AX 200 /*Set the horizontal position of cursor A to 200*/

:CURSor:TRACk:AX? /*The query returns 200*/

:CURSor:TRACk:BX

Command format	:CURSor:TRACk:BX <x> :CURSor:TRACk:BX?			
Function description	Set or query the horizontal position of cursor B when cursor tracking measurement.			
Parameter	Name	Type	Range	Default value
	<x>	Integer	0 to 770	500
Description	The horizontal and vertical positions of the cursor are defined by the pixel coordinates of the screen. The pixel coordinates of the screen range from (0,0) to (770,400). Among them, (0,0) is the upper left corner of the screen, and (770,400) is the lower right corner of the screen. The pixel range in the horizontal direction is 0 to 770, and the pixel range in the vertical direction is 0 to 400.			
Return format	The query returns an integer between 0 and 770.			

For example,

:CURSor:TRACk:BX 200 /*Set the horizontal position of cursor B to 200*/

:CURSor:TRACk:BX? /*The query returns 200*/

:CURSor:TRACk:AY?

Command format	:CURSor:TRACk:AY?
Function description	Query the vertical position of cursor A during cursor tracking measurement.
Description	▷The horizontal and vertical positions of the cursor are defined by the pixel coordinates of the screen. The pixel coordinates of the screen range from (0,0) to (770,400). Among them, (0,0) is the upper left corner of the screen, and (770,400) is the lower right corner of the screen. The pixel range in the horizontal direction is 0 to 770, and the pixel range in the vertical direction is 0 to 400. ▷When cursor A is outside the vertical range of the screen display, the query fixedly returns 4294967295.
Return format	The query returns an integer.

For example,

:CURSor:TRACk:AY? /*The query returns 284*/

:DISPlay Command Subsystem

:DISPlay:CLEar

Command format	:DISPlay:CLEar
Function description	Clear all waveforms on the screen.
Description	If the oscilloscope is in the RUN state, it will continue to display new waveforms after clearing.

For example,

:DISPlay:CLEar /*Clear all waveforms on the screen*/

:DISPlay:TYPE

Command format	:DISPlay:TYPE <type> :DISPlay:TYPE?			
Function description	Sets or queries how waveforms are displayed on the screen.			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{VECTors|DOTS}	VECTors
Description	▷ VECTors: Displayed by connecting lines between sampling points. This mode provides the most realistic waveform in most cases. Easily view the steep edges of a waveform, such as a square wave. ▷ DOTS: Display sampling points directly. You can see each sampling point visually and use the cursor to measure the X and Y values of that point.			
Return format	The query returns VECT or DOTS.			

For example,

:DISPlay:TYPE DOTS /*Selection point display method*/

:DISPlay:TYPE? /*The query returns DOTS*/

:DISPlay:GRADing:TIME

Command format	:DISPlay:GRADing:TIME <time> :DISPlay:GRADing:TIME?

Function description	Set or query the persistence time. The default unit is s.			
Parameter	Name	Type	Range	Default
	<time>	Discrete	{MIN||1|5|10|30|INFinite}	MIN
Description	▷MIN: Set the afterglow time to the minimum value to observe the waveform that changes at a high refresh rate. ▷Specified value: Set the afterglow time to one of the above specified values, you can observe the burr with slow change or low probability of occurrence. ▷INFinite: When infinite persistence is selected, when the oscilloscope displays a new waveform, the previously acquired waveform will not be cleared. Measures noise and jitter to capture infrequent events.			
Return format	The query returns MIN, 1, 5, 30, or INF.			

For example,

:DISPlay:GRADing:TIME 1 /*Set the afterglow time to 1s*/

:DISPlay:GRADing:TIME? /*The query returns 1*/

:DISPlay:WBRightness

Command format	:DISPlay:WBRightness <time> :DISPlay:WBRightness?			
Function description	Set or query the brightness of the waveform display on the screen.			
Parameter	Name	Type	Range	Default
	<time>	Integer	0 to 10	60
Return format	The query returns an integer between 0 and 100.			

For example,

:DISPlay:WBRightness 50 /*Set the waveform brightness to 50%*/

:DISPlay:WBRightness? /*The query returns 50*/

:DISPlay:GRID

Command format	:DISPlay:GRID <grid> :DISPlay:GRID?			
Function description	Sets or queries the type of grid displayed on the screen.			
Parameter	Name	Type	Range	Default
	<grid>	Discrete	{FULL|HALF|NONE}	FULL
Description	FULL: Turn on the background grid and coordinates. HALF: Turn off the background grid and turn on the coordinates only. NONE: Turn off the background grid and coordinates.			
Return format	The query returns FULL, HALF, or NONE.			

For example,

:DISPlay:GRID NONE /*Close background grid and coordinates*/

:DISPlay:GRID? /*The query returns NONE*/

:DISPlay:GBRightness

Command format	:DISPlay:GBRightness <brightness> :DISPlay:GBRightness?
Function description	Sets or queries the brightness of the screen grid.

Parameter	Name	Type	Range	Default
	<brightness>	Integer	0 to 100	50
Return format	The query returns an integer between 0 and 100.			

For example,

:DISPlay:GBRightness 60 /*Set the screen grid brightness to 60%*/

:DISPlay:GBRightness? /*The query returns 60*/

:DECoder command subsystem

The :DECoder command is used to perform settings and operations related to decoding tables.

:DECoderMODE

Command format	:DECoder:MODE <mode> :DECoder:MODE?			
Function description	Sets or queries the type of decoder.			
Parameter	Name	Type	Range	Default
	<mode>	Discrete	{UART|LIN|CAN|SPI|IIC}	UART
Description	UART, SPI, IIC, CAN, LIN correspond to UART decoding, SPI decoding and IIC decoding. LIN decoding, CAN decoding.			
Return format	The query returns UART, LIN, CAN, SPI or IIC.			

For example,

:DECoder1: MODE SPI /*Set the decoder type to SPI*/

:DECoder1: MODE? /*The query returns SPI*/

:DECoder:DISPlay

Command format	:DECoder:DISPlay <bool> :DECoder:DISPlay?			
Function description	Turn decoding function on or off, or query decoding function.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	Only when the corresponding trigger is entered can the corresponding decoding be performed.			
Return format	The query returns 1 or 0.			

For example,

:DECoder1:DISPlay ON /*Turn on decoder 1*/

:DECoder1:DISPlay? /*The query returns 1*/

:DECoder:POSition

Command format	:DECoder<n>:POSition <pos> :DECoder<n>:POSition?			
Function description	Sets or queries the vertical position of the bus on the screen.			
Parameter	Name	Type	Range	Default
	<pos>	Integer	0 to 400	50
Description	Divide the screen vertically into 400 parts, from 0 to 400 from top to bottom.			

Return format	The query returns an integer between 0 and 400.

For example,

:DECoder1:POSition 300 /*Set the vertical position of the bus to 300*/

:DECoder1:POSition? /*The query returns 300*/

:TABLE:MODE

Command format	:TABLE:MODE <mode> :TABLE:MODE?			
Function description	Sets or queries the type of the table decoder.			
Parameter	Name	Type	Range	Default
	<mode>	Discrete	{UART|LIN|CAN|SPI|IIC}	UART
Description	UART, SPI, IIC, CAN, LIN correspond to UART decoding, SPI decoding and IIC decoding. LIN decoding, CAN decoding			
Return format	The query returns UART, LIN, CAN, SPI or IIC.			

For example,

:TABLE:MODE SPI /*Set the decoder type to SPI*/

:TABLE:MODE? /*The query returns SPI*/

:TABLE:DISPlay

Command format	:TABLE:DISPlay <bool> :TABLE:DISPlay?			
Function description	Turn the form decoding function on or off, or query the form decoding function.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	Only when the corresponding trigger is entered can the corresponding decoding be performed.			
Return format	The query returns 1 or 0.			

For example,

:TABLE:DISPlay ON /*Turn on the table decoder 1*/

:TABLE:DISPlay? /*The query returns 1*/

:SEGMENTation command subsystem

The :SEGMENTation command is used to set the parameters for segmented acquisition.

:SEGMENTation:WRECord

Command format	:SEGMENTation:WRECord <frame> :SEGMENTation:WRECord?			
Function description	Set or query the number of frames for segmented acquisition.			
Parameter	Name	Type	Range	Default
	<frame>	Integer	80000	2
Description	The number of frames can be set differently for different acquisition lengths			
Return format	The query returns the number of segmented frames as an integer.			

For example,

:SEGMENTation:WRECord 4096 /*Set the number of frames for segmented acquisition to 4096*/

:SEGMENTation:WRECord? /*The query returns 4096*/

:SEGMENTation:ENABle

Command format	:SEGMENTation:ENABle <bool> :SEGMENTation:ENABle?			
Function description	Turn the segmented acquisition function on or off, or query the status of the segmented acquisition function.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description				
Return format	The query returns 1 or 0.			

For example,

SEGMENTation:ENABle ON /*Enable segment acquisition function*/

SEGMENTation:ENABle? /*The query returns 1*/

:HISTORY Command Subsystem

The :HISTORY command is used to set the parameters related to waveform recording and playback.

:HISTory:WRECord:

Command format	:HISTory:WRECord <frame> :HISTory:WRECord?			
Function description	Set or query the historical waveform display positive sequence number.			
Parameter	Name	Type	Range	Default
	<frame>	Integer	1 to the maximum number of frames that can be currently recorded	1
Description	The maximum current recordable frame number can be queried by the: FUNCtion: WRECord: FMAX? Command.			
Return format	The query returns the current display frame number as an integer.			

For example,

:HORTory:WRECord 16 /*Set the number of termination frames to 4096*/

:HORTory:WRECord? /*The query returns 4096*/

:HORTory:WRECord:FINTerval

Command format	:HORTory:WRECord:FINTerval <interval> :HORTory:WRECord:FINTerval?			
Function description	Set or query the time interval between frames during waveform playback. The default unit is s.			
Parameter	Name	Type	Range	Default
	<interval>	Integer	10ms to 10s	10ms
Return format	The query returns the currently set time interval in scientific notation.			

For example,

:HORTory:WRECord:FINTerval 0.001 / * Set the time interval to 1ms * /

:HORTory:WRECord:FINTerval? / * The query returns 1.000000e-03 * /

:HORTory:TABLE:ENABle

Command format	:HORTory:TABLE:ENABle <bool> :HORTory:TABLE:ENABle?			
Function description	Turn the history waveform table display function on or off, or query the status of the history waveform table display function.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description				
Return format	The query returns 1 or 0.			

For example,

:FUNCtion:TABLE:ENABle 1 /*Enable historical waveform table display function*/

:FUNCtion:TABLE:ENABle? /*The query returns 1*/

:HORTory:ENABle

Command format	:HORTory:ENABle <bool> :HORTory:ENABle?			
Function description	Turn history waveform function on or off, or query the status of history waveform function.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description				
Return format	The query returns 1 or 0.			

For example,

:FUNCtion:ENABle 1 /*Enable historical waveform function*/

:FUNCtion:ENABle? /*The query returns 1*/

: MATH command subsystem

The :MATH command is used to set various calculation functions of the waveform between channels.

:MATH:DISPlay

Command format	:MATH:DISPlay <bool> :MATH:DISPlay?			
Function description	Turn the math operation function on or off or query the status of the math operation function.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Return format	The query returns 1 or 0.			

For example,

:MATH:DISPlay ON /*Turn on the mathematical operation function*/

:MATH:DISPlay? /*Query returns 1*/

:MATH:OPERator

Command format	:MATH:OPERator <opt> :MATH:OPERator?			
Function description	Sets or queries the operator of a mathematical operation.			
Parameter	Name	Type	Range	Default
	<opt>	Discrete	{ADD|SUBTract|MULTiply|DIVision|FFT|INTG|DIFF|SQRT }	ADD
Description	When FX is selected as the parameter of the: MATH: SOURce1 and / or: MATH: SOURce2 command, this command is used to set the operator of the combined operation outer operation. The scope of <opt> is {ADD | SUBTract | MULTiply | DIVision | INTG | DIFF | SQRT | LOG | LN | EXP | ABS}.			
Return format	The query returns ADD, SUBT, MULT, DIV, FFT, INTG, DIFF, SQRT.			

For example,

:MATH:OPERator INTG /*Set the mathematical operator to integral operation*/

:MATH:OPERator? /*Query returns INTG*/

:MATH:SOURce1

Command format	:MATH:SOURce1 <src> :MATH:SOURce1?			
Function description	Set or query the source or source A of algebraic operations.			
Parameter	Name	Type	Range	Default
	<src>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	▷For algebraic operations, this command is used to set source A. ▷For function operations, only use this command to set the source. ▷For combinational operations, when the outer operation is algebraic operation, this command is used to set the source A of the outer operation. The range of <src> is {CHANnel1 | CHANnel2 | CHANnel3 | CHANnel4 | FX}; when the outer operation is a function During calculation, only use this command to set the source of the outer calculation. <Src> can only be set to FX. Note: For a combination operation whose outer operation is algebraic operation, at least one of the source A and the source B of the outer operation needs to choose FX.			
Return format	The query returns CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:MATH:SOURce1 CHANnel3 /*Set the source A of algebraic operation to CH3*/

:MATH:SOURce1? /*The query returns CHAN3*/

:MATH:SOURce2

Command format	:MATH:SOURce2 <src> :MATH:SOURce2?
Function description	Set or query the source B of the algebraic operation / combination operation.

Parameter	Name	Type	Range	Default
	<src>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	▷This command is only applicable to the combined operation of algebraic operations (containing two sources) and outer operations as algebraic operations. ▷For a combination operation whose outer operation is algebraic operation, this command is used to set the source B of the outer operation. Note: For a combination operation whose outer operation is algebraic operation, at least one of the source A and source B of the outer operation needs to select FX. ▷When selecting FX, you can send: MATH: OPTion: FX: SOURce1,: MATH: OPTion: FX: SOURce2, and: MATH: OPTion: FX: OPERator commands to set the source and operator of the inner operation of the combined operation.			
Return format	The query returns CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:MATH:SOURce2 CHANnel3 /*Set the source B of the algebra operation to CH3*/

:MATH:SOURce2? /*The query returns CHAN3*/

:MATH:SCALe

Command format	:MATH:SCALe <scale> :MATH:SCALe?			
Function description	Set or query the vertical scale of the operation result. The unit is related to the currently selected operator and the unit selected by the source.			
Parameter	Name	Type	Range	Default
	<scale>	Integer	Maximum range is 1p to 5T (1-2-5 steps)	1.00V
Description	The setting range of the vertical scale is related to the currently selected operator and the scale of the source channel. For integral and differential operations, it is also related to the current horizontal time base.			
Return format	The query returns the vertical scale of the current operation result in scientific notation.			

For example,

:MATH:SCALe 2 /*Set the vertical scale to 2V*/

:MATH:SCALe? /*The query returns 2.000000e + 00*/

:MATH:OFFSet

Command format	:MATH:OFFSet <offs> :MATH:OFFSet?			
Function description	Sets or queries the vertical offset of the operation result. The unit is related to the currently selected operator and the unit selected by the source.			
Parameter	Name	Type	Range	Default
	<offs>	Integer	Associated with the vertical scale of the calculation result (-1000 ×	0.00V

			MathVerticalScale) to (1000 × MathVerticalScale) in steps of MathVerticalScale / 50	
Description	MathVerticalScale is the vertical scale of the calculation result, which can be set by the: MATH: SCALe command.			
Return format	The query returns the vertical offset of the current operation result in scientific notation.			

For example,

:MATH:OFFSet2 /*Set vertical offset to 2V*/

:MATH:OFFSet? /*The query returns 2.000000e + 00*/

:MATH:FFT:SOURce

Command format	:MATH:FFT:SOURce <src> :MATH:FFT:SOURce?			
Function description	Set or query the source of FFT operation / filter.			
Parameter	Name	Type	Range	Default
	<src>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Return format	The query returns CHANnel1, CHANnel2, CHANnel3, or CHANnel4.			

For example,

:MATH:FFT:SOURce CHANnel1 /*Set the source of FFT operation to CH1*/

:MATH:FFT:SOURce? /*The query returns CHAnel1*/

:MATH:FFT:WINDow

Command format	:MATH:FFT:WINDow <wndow> :MATH:FFT:WINDow?			
Function description	Sets or queries the window function of the FFT operation.			
Parameter	Name	Type	Range	Default
	<wndow>	Discrete	{RECTangle|BLACkman|HANNing| HAMMing| FLATtop|TRIangle}	RECTangle
Description	▹Using the window function can effectively reduce the effect of spectral leakage. ▹Each window function is suitable for measuring different waveforms. You need to choose according to the measured waveform and its characteristics.			
Return format	The query returns RECT, BLAC, HANN, HAMM, FLAT, or TRI.			

For example,

:MATH:FFT:WINDow BLACkman /*Set the window function for FFT operation to Blackman*/

:MATH:FFT:WINDow? /*The query returns BLACK*/

:MATH:FFT:SPLit

Command format	:MATH:FFT:SPLit <bool> :MATH:FFT:SPLit?
Function description	Turn on or off the half-screen display during FFT calculation, or query the status of half-screen display during FFT calculation.

Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	1|ON
Description	▷Open half-screen: The source channel and FFT calculation results are displayed on a half-screen, and the time and frequency domain signals are clear at a glance. ▷Close half screen (full screen): The source channel and the FFT calculation result are displayed in the same window. You can observe the spectrum more clearly and make more accurate measurements.			
Return format	The query returns 1 or 0.			

For example

:MATH:FFT:SPLit OFF /*Turn off half screen display*/

:MATH:FFT:SPLit? /*The query returns 0*/

: MATH: FFT: UNIT

Command format	:MATH:FFT:UNIT <unit> :MATH:FFT:UNIT?			
Function description	Sets or queries the vertical unit of the FFT operation result.			
Parameter	Name	Type	Range	Default
	<unit>	Discrete	{VRMS|DB}	DB
Return format	Query returns VRMS or DB。			

For example,

:MATH:FFT:UNIT VRMS /*Set the vertical unit of the FFT operation result to Vrms*/

:MATH:FFT:UNIT? /*The query returns VRMS*/

:MATH:FFT:HSCale

Command format	:MATH:FFT:HSCale <hsc> :MATH:FFT:HSCale?			
Function description	Set or query the horizontal scale of the FFT operation result. The default unit is Hz.			
Parameter	Name	Type	Range	Default
	<hsc>	Integer	Reference description	5MHz
Description	▷<hsc> can be set to 1/1000, 1/400, 1/200, 1/100, 1/40, or 1/20 of the FFT sampling rate. ▷When the FFT mode is TRACe, the FFT sampling rate is the screen sampling rate (ie 100 / horizontal time base). When the FFT mode is MEMory, the FFT sampling rate is the memory sampling rate (: ACQuire: SRATe?). ▷You can observe the detailed information of the spectrum by reducing the horizontal scale.			
Return format	The query returns the current horizontal scale in scientific notation.			

For example,

:MATH:FFT:HSCale 125000 /*Set the horizontal scale of the FFT calculation result to 125kHz*/

:MATH:FFT:HSCale? /*The query returns 1.25000e + 05*/

:MATH:FFT:HCENter

Command format	:MATH:FFT:HCENter <cent> :MATH:FFT:HCENter?			
Function description	Set or query the center frequency of the FFT operation result, that is, the frequency corresponding to the horizontal center of the screen. The default unit is Hz.			
Parameter	Name	Type	Range	Default
	<cent>	Integer	Reference description	5MHz
Description	▷When the FFT mode is TRACe (trace), the range of <cent> is 0 to (0.4 × FFT sampling rate); where the FFT sampling rate is the screen sampling rate (that is, 100 / horizontal time base). When the FFT mode is MEMory, the range of <cent> is 0 to (0.5 × FFT sampling rate); where the FFT sampling rate is the memory sampling rate (: ACQuire: SRATe?). ▷The set step is the horizontal scale / 50 of the current FFT calculation result.			
Return format	The query returns the current center frequency in scientific notation.			

For example,

:MATH:FFT:HCENter 10000000 /*Set the center frequency of the FFT operation result to 10MHz*/

:MATH:FFT:HCENter? /*The query returns 1.000000e + 07*/

:MASK command subsystem

The :MASK command is used to set and query related parameters in the pass / fail test.

:MASK:ENABle

Command format	:MASK:ENABle <bool> :MASK:ENABle?			
Function description	Turn the pass / fail test function on or off, or query the status of the pass / fail test function.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	The pass / fail test function is invalid in the following cases: the horizontal time base mode is XY or ROLL mode, the slow scan mode (that is, the horizontal time base is YT mode, the horizontal time base is 200ms / div or slower), and the waveform is recorded.			
Return format	The query returns 1 or 0.			

For example,

:MASK:ENABle ON /*Turn on the pass / fail test function*/

:MASK:ENABle? /*The query returns ON*/

:MASK:SOURce

Command format	:MASK:SOURce <source> :MASK:SOURce?			
Function description	Set or query the measurement source of the pass / fail test.			
Parameter	Name	Type	Range	Default

	<source>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	This command can only set the channels that have been opened. You can send the: CHANnel <n>: DISPlay command to open the required channels.			
Return format	The query returns CHAN1, CHAN2, CHAN3, or CHAN4.			

For example,

:MASK:SOURce CHANnel2 /*Set the measurement source of the pass / fail test to CH2*/

:MASK:SOURce? /*The query returns CHAN2*/

:MASK:OPERate

Command format	:MASK:OPERate <oper> :MASK:OPERate?			
Function description	Run or stop the pass / fail test, or query the running status of the pass / fail test.			
Parameter	Name	Type	Range	Default
	<oper>	Discrete	{RUN|STOP}	STOP
Description	Before executing this command, you need to send the: MASK: ENABle command to enable the pass / fail test function.			
Return format	The query returns RUN or STOP.			

For example,

:MASK:OPERate RUN /*Run pass / fail test function*/

:MASK:OPERate? /*The query returns RUN*/

:MASK:MDISplay

Command format	:MASK:MDISplay <bool> :MASK:MDISplay?			
Function description	When the pass / fail test is turned on, turn statistics on or off, or query the status of the statistics.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	▷Before executing this command, you need to send the: MASK: ENABle command to enable the pass / fail test function. ▷When the statistical information is turned on, the test results shown in the figure below will be displayed in the upper right corner of the screen. ▷You can send: MASK: PASSed ?,: MASK: FAILed ?, and: MASK: TOTal? Commands to query the test results.			
Return format	The query returns 1 or 0.			

For example,

:MASK:MDISplay ON /*Open statistics*/

:MASK:MDISplay? /*The query returns 1*/

:MASK:SOOutput

Command format	:MASK:SOOutput <bool> :MASK:SOOutput?			
Function description	Turn output on or off, or query output stop status.			
Parameter	Name	Type	Range	Default

	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	▷On: When a failed waveform is detected, the oscilloscope will stop the test and enter the "STOP" state. At this time, the screen keeps displaying the measurement result (if the display is turned on), and the rear panel [Trigger Out] (if enabled) outputs only one pulse. ▷Off: Even if a failed waveform is detected, the oscilloscope will continue the test, and the test results on the screen are continuously updated. The [Trigger Out] on the rear panel will output a pulse each time a failed waveform is detected.			
Return format	The query returns 1 or 0.			

For example,

:MASK:SOOutput ON /*Stop the output*/

:MASK:SOOutput? /*The query returns 1*/

:MASK:OUTPut

Command format	:MASK:OUTPut <bool> :MASK:OUTPut?			
Function description	Turn on or off the sound prompt when the test fails output, or query the status of the sound prompt.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	▷Off: When a failed waveform is detected, it will be displayed and output, but the buzzer will not alarm. ▷On: When a failed waveform is detected, it will be displayed and output, and the buzzer will give an audible alarm (not related to the sound switch state)			
Return format	The query returns 1 or 0.			

For example,

:MASK:OUTPut ON /*Turn on the sound prompt*/

:MASK:OUTPut? /*The query returns 1*/

:MASK:X

Command format	:MASK:X <x> :MASK:X?			
Function description	Set or query the level adjustment parameter in the pass / fail test rule. The default unit is div.			
Parameter	Name	Type	Range	Default
	<x>	Integer	0.02 to 4 in steps of 0.02	0.02
Return format	The query returns the current level adjustment parameter in scientific notation.			

For example,

:MASK:X 0.28 /*Set the level adjustment parameter to 0.28div*/

:MASK:X? /*The query returns 2.800000e-01*/

:MASK:Y

Command format	:MASK:Y <y> :MASK:Y?

Function description	Sets or queries the vertical adjustment parameter in the pass / fail test rule. The default unit is div.			
Parameter	Name	Type	Range	Default
	<y>	Integer	0.04 to 5.12 in 0.04 steps	0.96
Return format	The query returns the current vertical adjustment parameter in scientific notation.			

For example,

:MASK:Y 0.36 /*Set the vertical adjustment parameter to 0.36div*/

:MASK:Y? /*The query returns 3.600000e-01*/

:MASK:CREate

Command format	:MASK:CREate
Function description	Create a pass / fail rule with the currently set horizontal and vertical adjustment parameters.
Description	This command is valid only when the pass / fail test function is turned on (: MASK: ENABle) and is not running (: MASK: OPERate).

:MASK:PASSed?

Command format	:MASK:PASSed?
Function description	Query the number of frames passed in the pass / fail test.
Return format	The query returns an integer.

:MASK:FAILed?

Command format	:MASK:FAILed?
Function description	Query the number of frames that failed in the pass / fail test.
Return format	The query returns an integer.

:MASK:TOTal?

Command format	:MASK:TOTal?
Function description	Query the total number of frames that passed / failed the test.
Return format	The query returns an integer.

:MASK:RESet

Command format	:MASK:RESet
Function description	Resets the number of frames passed, failed frames, and total frames in the pass / fail test.

:MEASure Command subsystem

:MEASure:SOURce

Command format	:MEASure:SOURce <sour> :MEASure:SOURce?			
Function description	Set or query the source of the current measurement parameters.			
Parameter	Name	Type	Range	Default

	<sour>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30| D31|D32|D33|D40|D41|D42|D43| CHANnel1|CHANnel2|CHANnel3|CHANnel4|MATH}	CHANnel1
Description	Only the channels that are currently open are selectable.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4, or MATH.			

For example,

:MEASure:SOURce CHANnel2 /*Set parameter measurement source to CH2*/

:MEASure:SOURce? /*Query returns CHAN2*/

:MEASure:COUNter: SOURce

Command format	:MEASure:COUNter:SOURce <sour> :MEASure:COUNter:SOURce?			
Function description	Set or query the frequency meter's measurement source, or turn off the frequency meter function.			
Parameter	Name	Type	Range	Default
	<sour>	Discrete	{ CHANnel1|CHANnel2|CHANnel3|CHANnel4|OFF}	OFF
Description	▷For analog channels CH1 to CH4, it is selectable whether or not the channel is currently turned on. Note: When any channel from D0 to D7 is opened, CH4 is not selectable; when any channel from D8 to D15 is opened, CH3 is not selectable. ▷For digital channels D0 to D15, only the channels that are currently turned on are selectable.			
Return format	The query returns D0、D1、D2、D3、D4、D5、D6、D7、D8、D9、D10、D11、D12、D13、D14、D15、CHAN1、CHAN2、CHAN3、CHAN4 or OFF。			

For example,

:MEASure:COUNter: SOURce CHANnel2 /*Set the frequency meter measurement source to CH2*/

:MEASure:COUNter: SOURce? /*Query returns CHAN2*/

:MEASure:COUNter: VALue?

Command format	:MEASure:COUNter:VALue?
Function description	Query the measurement result of the frequency meter. The default unit is Hz.
Return format	The query returns the current measurement value in scientific notation. If the frequency counter function is not currently turned on, 0.0000000e + 00 is returned.

For example,

:MEASure:COUNter:VALue? /*The query returns 1.000004e + 03*/

:MEASure:CLEar

Command format	:MEASure:CLEar <item>

Function description	Clear any or all of the last 5 measurements opened.			
Parameter	Name	Type	Range	Default
	<item>	Discrete	{ITEM1|ITEM2|ITEM3|ITEM4|ITEM5|ALL}	——
Description	▷You can use the: MEASure: ITEM command to open the parameters to be measured among the 37 parameters. The last 5 parameters are determined by the order in which you open them and will not change because you delete one or more measurements. ▷After clearing one or all measurement items, you can also use the: MEASure: RECover command to restore.			

For example,

:MEASure:CLEar ITEM1 /*Clear measurement item ITEM1*/

:MEASure:RECover

Command format	:MEASure:RECover <item>			
Function description	Restore cleared measurements.			
Parameter	Name	Type	Range	Default
	<item>	Discrete	{ITEM1|ITEM2|ITEM3|ITEM4|ITEM5|ALL}	——
Description	▷You can use the: MEASure: ITEM command to open the parameters to be measured among the 37 parameters. The last 5 parameters are determined by the order in which you open them and will not change because you delete one or more measurements. ▷After restoring an item or all measurements, you can also use the: MEASure: CLEar command to clear it again.			

:MEASure:ADISplay

Command format	:MEASure:ADISplay <bool> :MEASure:ADISplay?			
Function description	Turn all measurements on or off, or query the current status of all measurements.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	All measurement functions can measure 29 kinds of measurement parameters of the current measurement source at the same time: Voltage parameters: maximum value, minimum value, peak-to-peak value, top-to-peak value, bottom-end value, amplitude, high value, median value, low value, average value, effective value , Overshoot, preshoot, period rms and variance time parameters: period, frequency, rise time, fall time, positive pulse width, negative pulse width, positive duty cycle, negative duty cycle, maximum time value, minimum time value Other parameters: positive slope, negative slope, area and period area. All measurement functions can measure CH1, CH2, CH3, and CH4 as well as the MATH channel at the same time. Send the: MEASure: AMSource command to set the source of all measurement functions.			
Return format	The query returns 1 or 0.			

For example,

:MEASure:ADISplay ON /*Turn on all measurements*/

:MEASure:ADISplay? /*Query returns 1*/

:MEASure:AMSource

Command format	:MEASure:AMSource <src>[,<src>[,<src>[,<src>]]] :MEASure:AMSource?			
Function description	Set or query the source of all measurement functions.			
Parameter	Name	Type	Range	Default
	<src>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4|MATH}	CHANnel1
Return format	The query returns CHAN1, CHAN2, CHAN3, CHAN4 or MATH. Multiple sources are separated by commas.			

For example,

:MEASure:AMSource CHANnel1, CHANnel3 /*Set the source of all measurement functions to CH1 and CH3*/

:MEASure:AMSource? /*The query returns CHAN1, CHAN3*/

:MEASure:SETup:PSA

Command format	:MEASure:SETup:PSA <source> :MEASure:SETup:PSA?			
Function description	Set or query the channel source of signal source A in phase 1 → 2 and phase 1 → 2 measurement.			
Parameter	Name	Type	Range	Defaulte
	<source>	Discrete	{D0|D1|D2|D3|D4|D5|D6|D7|D8|D9|D10|D11|D12|D13|D14|D15|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Return format	The query returns D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, CHAN1, CHAN2, CHAN3 or CHAN4.			

For example,

:MEASure:SETup:PSA CHANnel1 /*Set the source A of the phase measurement to CH1*/

:MEASure:SETup:PSA? /*The query returns CHAN1*/

:MEASure:SETup:PSB

Command format	:MEASure:SETup:PSB <source> :MEASure:SETup:PSB?			
Function description	Set or query the channel source of signal source B in phase 1 → 2 and phase 1 → 2 measurement.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D0|D1|D2|D3|D4|D5|D6|D7|D8|D9|D10|D11|D12|D13|D14|D15|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel2

Return format	The query returns D0、D1、D2、D3、D4、D5、D6、D7、D8、D9、D10、D11、D12、D13、D14、D15、CHAN1、CHAN2、CHAN3 or CHAN4。

For example,

: MEASure: SETup: PSB CHANnel2 / * Set the source B of the phase measurement to CH2 * /

: MEASure: SETup: PSB? / * The query returns CHAN2 * /

:MEASure:SETup:DSA

Command format	:MEASure:SETup:DSA <source> :MEASure:SETup:DSA?			
Function description	Set or query the delay 1 → 2 and delay 1 → 2 channel source of source A in the measurement.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D0|D1|D2|D3|D4|D5|D6|D7|D8|D9|D10|D11|D12|D13|D14|D15|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Return format	The query returns D0、D1、D2、D3、D4、D5、D6、D7、D8、D9、D10、D11、D12、D13、D14、D15、CHAN1、CHAN2、CHAN3 or CHAN4。			

For example,

:MEASure:SETup: DSA CHANnel1 /*Set the source A of the delay measurement to CH1*/

:MEASure:SETup: DSA? /*The query returns CHAN1*/

MEASure:SETup:DSB

Command format	:MEASure:SETup:DSB <source> :MEASure:SETup:DSB?			
Function description	Set or query delay 1 → 2 and delay 1 → 2 channel source of source B in the measurement.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D0|D1|D2|D3|D4|D5|D6|D7|D8|D9|D10|D11|D12|D13|D14|D15|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel2
Return format	The query returns D0、D1、D2、D3、D4、D5、D6、D7、D8、D9、D10、D11、D12、D13、D14、D15、CHAN1、CHAN2、CHAN3 or CHAN4。			

For example,

:MEASure:SETup:DSB CHANnel2 /*Set the source B of delay measurement to CH2*/

:MEASure:SETup:DSB? /*The query returns CHAN2*/

:MEASure:STATistic:DISPlay

Command format	:MEASure:STATistic:DISPlay <bool> :MEASure:STATistic:DISPlay?			
Function description	Turn the statistics function on or off, or query the status of the statistics function.			
Parameter	Name	Type	Range	Default

	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	When the statistics function is turned on, the oscilloscope counts and displays the statistical results of up to 5 measurement parameters that were turned on last.			
Return format	The query returns 1 or 0.			

For example,

:MEASure:STATistic: DISPlay ON /*Turn on statistics function*/

:MEASure:STATistic: DISPlay? /*Query returns 1*/

:MEASure:STATistic:MODE

Command format	:MEASure:STATistic:MODE <mode> :MEASure:STATistic:MODE?			
Function description	Set or query statistics mode.			
Parameter	Name	Type	Range	Default
	<mode>	Discrete	{DIFFerence|EXTRemum}	EXTRemum
Description	DIFFerence: Select the difference mode. The statistical results are the current value, average value, standard deviation, and count value. EXTRemum: Select the extreme mode. The statistical results are the current value, average value, minimum value, and maximum value. Send the: MEASure: STATistic: DISPlay command to turn on the statistics function. When the statistics function is turned on, the oscilloscope counts and displays the statistical results of up to 5 measurement parameters that were turned on last.			
Return format	The query returns DIFF or EXTR.			

For example,

:MEASure:STATistic: MODE DIFFerence /*Set statistics mode to difference mode*/

:MEASure:STATistic: MODE? /*The query returns DIFF*/

:MEASure:STATistic: RESet

Command format	:MEASure:STATistic:RESet
Function description	Clear historical statistics and restart statistics.

:MEASure:STATistic:ITEM

Command format	:MEASure:STATistic:ITEM <item>[,<src>[,<src>]] :MEASure:STATistic:ITEM? <type>,<item>[,<src>[,<src>]]			
Function description	Turn on the statistical function of the arbitrary waveform parameters of the specified source, or query the statistical results of the arbitrary waveform parameters of the specified source.			
Parameter	Name	Type	Range	Default
	<item>	Discredit	{VMAX|VMIN|VPP|VTOP|VBASe|VAMP|VAVG|VRMS| OVERshoot|PREShoot|MARea|MPARea|PERiod| FREQuency|RTIMe|FTIMe|PWIDth|NWIDth|PDUTy|	——

			NDUTy|RDELay|FDELay|RPHase|FPHase|TVMAX| TVMIN|PSLEWrate|NSLEWrate|VUPper|VMID|VLOWer| VARIance|PVRMS|PPULses|NPULses|PEDGes|NEDGes}	
	<type>	Discredit	{MAXimum|MINimum|CURRent|AVERages| DEViation}	——
	<src>	Discredit	Refer to description	——
Description	▷The parameter [, <src> [, <src>]] is used to set the source of the measured parameter. ▷If the value of <item> is PEriod, FREQuency, PWIDth, NWIDth, PDUTy, NDUty, RDELay, FDELay, RPHase or FPHase, the range of <src> is: {D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | CHANnel1 | CHANnel2 | CHANnel3 | CHANnel4 | MATH}. If the value of <item> is other measurement parameters, the value range of <src> is: {CHANnel1 | CHANnel2 | CHANnel3 | CHANnel4 | MATH} ▷If the measurement parameter is a single source (VMAX, VMIN, VPP, VTOP, VBASe, VAMP, VAVG, VRMS, OVERshoot, MARea, MPARea, PREshoot, PEriod, FREQuency, RTIMe, FTIMe, PWIDth, NWIDth, PDUTy, NDUty, TVMAX, TVMIN, PSLEWrate, NSLEWrate, VUPper, VMID, VLOWer, VARIance, PVRMS, PPULses, NPULses, PEDGes, NEDGes), you only need to set a source. If this parameter is omitted, the default is the source selected by the: MEASure: SOURce command. ▷If the measurement parameters are dual sources (RDELay, FDELay, RPHase, FPHase), the command sent must include two sources, otherwise the command is invalid. If this parameter is omitted, the defaults are: MEASure: SETup: DSA and: MEASure: SETup: DSB,: MEASure: SETup: PSA, and: MEASure: SETup: PSB command.			
Return format	The query returns statistical results in scientific notation.			

For example,

:MEASure:STATistic:ITEM VPP, CHANnel2 /*Turn on the peak-to-peak statistics function of channel 2*/

:MEASure:STATistic:ITEM? MAXimum, VPP /*The query returns 9.120000e-01*/

: MEASure: ITEM

Command format	:MEASure:ITEM <item>[,<src>[,<src>]] :MEASure:ITEM? <item>[,<src>[,<src>]]			
Function description	Measure the arbitrary waveform parameters of the specified source, or query the measurement results of the arbitrary waveform parameters of the specified source.			
Parameter	Name	Type	Range	Default
	<item>	Discrete	{VMAX|VMIN|VPP|VTOP|VBASe|VAMP|VAVG| VRMS|OVERshoot|PREShoot|MARea|MPARea| PERiod|FREQuency|RTIMe|FTIMe|PWIDth|	——

			NWIDth|PDUTy|NDUTy|RDELay|FDELay| RPHase| FPHase|TVMAX|TVMIN|PSLEWrate| NSLEWrate| VUPper|VMID|VLOWer|VARIance| PVRMS|PPULses| NPULses|PEDGes|NEDGes}	
	<src>	Refer to description		
Description	▷The parameter [, <src> [, <src>]] is used to set the source of the measured parameter. ▷If the value of <item> is PEriod, FREQuency, PWIDth, NWIDth, PDUTy, NDUty, RDELay, FDELay, RPHase Or FPHase, the range of <src> is: {D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | CHANnel1 | CHANnel2 | CHANnel3 | CHANnel4 | MATH}. ▷If the value of <item> is other measurement parameters, the value range of <src> is: {CHANnel1 | CHANnel2 | CHANnel3 | CHANnel4 | MATH} ▷If the measurement parameter is a single source (VMAX, VMIN, VPP, VTOP, VBASe, VAMP, VAVG, VRMS, OVERshoot, PREshoot, MARea, MPARea, PEriod, FREQuency, RTIMe, FTIMe, PWIDth, NWIDth, PDUTy, NDUty, TVMAX, TVMIN, PSLEWrate, NSLEWrate, VUPper, VMID, VLOWer, VARIance, PVRMS, PPULses, NPULses, PEDGes, NEDGes), you only need to set one source. If this parameter is omitted, the default is the source selected by the: MEASure: SOURce command. ▷If the measurement parameters are two sources (RDELay, FDELay, RPHase, FPHase), The input command must include two sources, otherwise the command is invalid. If this parameter is omitted, the defaults are: MEASure: SETup: DSA and : MEASure: SETup: DSB,: MEASure: SETup: PSA, and : MEASure: SETup: PSB command selects the source.			
Return format	The query returns the current measurement value in scientific notation.			

For example,

:MEASure:ITEM OVERshoot, CHANnel2 /*Enable overshoot measurement for channel 2*/

:MEASure:ITEM? OVERshoot, CHANnel2 /*The query returns 8.888889e-03*/

:SAVE Command Subsystem

:SAVE is used for related data.

:SAVE:TYPE:

Command format	:SAVE:TYPE <type> :SAVE:TYPE?			
Function description	Save the oscilloscope related settings.			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{SETUP|WAVE|REF|CSV}	SETUP

Description	SETUP oscilloscope setup file, can be used later CSV waveform data file for use by other applications WAVE waveform data file, which can be used by other applications REF reference waveform file, can be used later WAVE
Return format	SETUP|WAVE|REF|CSV|TIFF

:SAVE:SOURCE:EXTERnal

Command format	:SAVE:SOURCE:EXTERnal :SAVE:SOURCE:EXTERnal?			
Function description	Rotate the position to save the oscilloscope related settings.			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{INTERnal|RXTERnaL	INTERnal
Description	INTERnal is stored inside the oscilloscope and can be reused later RXTERnaL is saved external to the oscilloscope and can be used by other applications			
Return format	INTERnal|RXTERnaL			

:SAVE:SOURCE:INTERnal

Command format	:SAVE:SOURCE:INTERnal<n> : SAVE:SOURCE:INTERnal?			
Function description	Save the corresponding parameters of the oscilloscope to the corresponding internal channels.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{0|1|2|3|4|5|6|7|8|9}	1
Description	Only the currently opened reference channel can be used as the current reference channel.			
Return format	INTERnal|RXTERnaL			

:RECALL command subsystem

The :RECALL is used to call up related parameters.

:ERCALL:TYPE:

Command format	:RECALL:IMAGe:TYPE <type> :RECALL:IMAGe:TYPE?			
Function description	Set or query the image type when the image is stored.			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{PNG|BMP8|BMP24|JPEG|TIFF}	PNG
Return format	The query returns PNG, BMP8, BMP24, JPEG or TIFF			

:REACLL:SOURCE:EXTERnal

Command format	:REACLL:SOURCE:EXTERnal :RECALL:SOURCE:EXTERnal?

Function description	Rotate the position to save the oscilloscope related settings.			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{INTERnal|RXTERnaL	INTERnal
Description	INTERnal is stored inside the oscilloscope and can be reused later RXTERnaL is saved external to the oscilloscope and can be used by other applications			
Return format	INTERnal|RXTERnaL			

:RECALL:SOURCE:INTERnal

Command format	RECALL:SOURCE:INTERnal<n> :RECALL:SOURCE:INTERnal?			
Function description	Save the corresponding parameters of the oscilloscope to the corresponding internal channels.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{0|1|2|3|4|5|6|7|8|9}	1
Description	Only the currently opened reference channel can be used as the current reference channel.			
Return format	INTERnal|RXTERnaL			

:STORage Command Subsystem

The: STORage command is used to set related parameters when the image is stored.

: STORage: IMAGe:

Command format	:STORage:IMAGe:			
Function description	Save screen picture to external memory			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{ |BMP24|JPEG|TIFF}	BMP24|

For example,

:STORage:IMAGe:TYPE PNG /*Set the image type to PNG when the image is stored*/

:STORage:IMAGe:TYPE? /*The query returns PNG*/

:SYSTem Command Subsystem

The :SYSTem Command is used to set system-related settings such as sound and language.

:SYSTem:AUToscale

Command format	:SYSTem:AUToscale <bool> :SYSTem:AUToscale?			
Function description	Enable or disable the front panel AUTO button, or query the status of the front panel AUTO button.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	1|ON
Description	▹The user can send this command or the front panel **Utility** -> **Auto** -> **Lock** Disable the AUTO button, and only enable the button by sending this command. ▹After the AUTO button is disabled, users cannot perform Auto Scale			

	operations. : AUToscale command is invalid.
Return format	The query returns 1 or 0.

For example

:SYSTem:AUToscale ON /*Enable the front panel AUTO button*/

:SYSTem:AUToscale? /*The query returns 1*/

:SYSTem:BEEPer 0

Command format	:SYSTem:BEEPer <bool> :SYSTem:BEEPer?			
Function description	Enable or disable the buzzer, or query the status of the buzzer			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	——
Return format	The query returns 1 or 0.			

For example

:SYSTem:BEEPer ON /*Enable buzzer*/

:SYSTem:BEEPer? /*The query returns 1*/

:SYSTem:ERRor[:NEXT]? 0

Command format	:SYSTem:ERRor[:NEXT]?
Function description	Query and clear the latest error message.
Return format	The query returns an error message in the format "<message number>, <message content>", where <message number> is an integer and <message content> is an ASCII string with double quotes. Such as -113, "Undefined header; command cannot be found".

:SYSTem:GAM?

Command format	:SYSTem:GAM?
Function description	Query the number of grids in the horizontal direction of the instrument screen.
Return format	The query returns 16.

:SYSTem:LANGuage

Command format	:SYSTem:LANGuage <lang> :SYSTem:LANGuage?			
Function description	Set or query the language displayed by the system.			
Parameter	Name	Type	Range	Default
	<lang>	Discrete	{SCHinese|ENGLish|PORTuguese|GERMan|POLish|KORean|JAPAnese|FRENch | RUSSian}	——
Description	Language settings are not affected by restoring factory defaults (send * RST).			
Return format	The query returns SCH, TCH, ENGL, PORT, GERM, POL, KOR, JAPA, FREN, or RUSS.			

For example,

:SYSTem:LANGuage SCHinese /*Set the system language to Simplified Chinese*/

:SYSTem:LANGuage? /*Query returns SCH*/

:SYSTem:LOCKed

Command format	:SYSTem:LOCKed <bool> :SYSTem:LOCKed?			
Function description	Turn the keyboard lock function on or off, or query the status of the keyboard lock function.			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Return format	The query returns 1 or 0.			

SYSTem:PON

Command format	:SYSTem:PON <pon> :SYSTem:PON?			
Function description	Set or query the type of configuration called when the oscilloscope is powered on again.			
Parameter	Name	Type	Range	Default
	<pon>	Discrete	{LATest|DEFault}	LATest
Return format	The query returns LAT or DEF.			

For example,

:SYSTem:PON LATest /*Set the last value to be called when the oscilloscope is powered on again*/

:SYSTem:PON? /*Query returns LAT*/

:SYSTem:OPTion:INSTall0

Command format	:SYSTem:OPTion:INSTall <license>			
Function description	Install options.			
Parameter	Name	Type	Range	Default
	<license>	ASCII string	Refer to description	——
Description	To install an option, first order the required option to obtain the key, and then use the key to obtain the option authorization code as follows.			

For example,

:SYSTem:OPTion:INSTall PDUY9N9QTS9PQSWPLAETRD3UJHYA

:SYSTem:OPTion:UNINSTall

Command format	:SYSTem:OPTion:UNINSTall
Function description	Uninstall the installed options.

:SYSTem:RAM?

Command format	:SYSTem:RAM
Function description	Query the number of analog channels of the instrument.
Return format	The query returns 4.

:SYSTem:SETup0

Command format	:SYSTem:SETup <setup_stream> :SYSTem:SETup?			
Function description	Import the oscilloscope setup parameters to restore the oscilloscope to the specified settings. Query the oscilloscope settings.			
Parameter	Name	Type	Range	Default
	<setup_stream>	Refer to description		
Description	The oscilloscope settings here correspond to "Setup Storage" under Storage Type. <setup_stream> Set parameters for the specified oscilloscope. It is the return value obtained by querying with the: SYSTem: SETup? Command. It cannot be set manually. For the specific format, please refer to the return format below. The main function of this command is to facilitate users to remotely export / import oscilloscope settings. To export the setup parameters of the oscilloscope under the specified settings, use the: SYSTem: SETup? Command to query and save the return value to a file. When you need to restore the oscilloscope to the specified settings later, you can import the oscilloscope setup parameters through the: SYSTem: SETup <setup_stream> command (note that <setup_stream> must be the return value obtained by previous query).			
Return format	The returned data consists of two parts, namely the TMC data description header and the setup data. The format of the TMC data description header is #NXXXXXX. Among them, # is an identifier; N is less than or equal to 9, and the N data that follows it represent the length (byte number) of the data stream. Such as # 9000002077, where N is 9, followed by 000002077 means that there are 2077 bytes of valid data at the end. The setting data is represented in binary form.			

SYSTem:DATE

Command format	SYSTem:DATE <year>, <month>, <day> SYSTem:DATE？			
Function description	Set the year, month and day of the system.			
Parameter	Name	Type	Range	Default
	<year>	Integer	4 digits	2018
	<month>	Integer	[1-12]	1
	<day>	Integer	[1-31]	1
Description	The returned string contains 3 segments separated by commas: year, month, day.			

For example,

The following command sets the system year, month, and day to August 8, 2018

:SYSTem: DATE 2018, 8, 8 /*Set the date of the oscilloscope to August 8, 2018*/

:SYSTem: DATE? /*The query returns the date as August 8, 2018*/

SYSTem:TIME

Command format	SYSTem:TIME <hour>, <minute>, <second > SYSTem:TIME？			
Function description	Set the hour, minute and second of the system.			
Parameter	Name	Type	Range	Default
	<hour>	Integer	[0-23]	6
	<minute>	Integer	[0-59]	6
	<second>	Integer	[0-59]	6
Description	The returned string contains 3 segments separated by commas: hour, minute, second			

For example,

The following command sets the system hours, minutes, and seconds to 6: 6: 6

:SYSTem:DATE 6, 6, 6 /*Set the time of the oscilloscope to 6: 6: 6*/

:SYSTemDATE? /*Query return time is 6: 6: 6*/

SYSTem:COMMunicate

The :COMMunicate command is used to set LAN and WLAN.

SYSTem:COMMunicate:<network>:AUTOip[:STATe]

Command format	SYSTem:COMMunicate:<network>:AUTOip <state> SYSTem:COMMunicate:<network>:AUTOip ?			
Function description	Turns the automatic IP mode (AUTOIP) on or off. Query the status of the AUTOIP mode.			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
	<state>	Discrete	{OFF|ON}	ON
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns the status of AUTO IP			

For example,

:SYSTem:COMMunicate:LANAUTOip ON /*Turn on AUTOIP mode*/

:SYSTem:COMMunicate:LAN:AUTOip? /*The query returns ON*/

SYSTem:COMMunicate:<network>:DHCP[:STATe]

Command format	SYSTem:COMMunicate:<network>:DHCP<state> SYSTem:COMMunicate:<network>:DHCP ?			
Function description	Turn dynamic IP mode (AUTOIP) on or off. Query the status of the dynamic IP mode.			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
	<state>	Bool	{OFF|ON}	ON
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			

Return format	Returns ON or OFF

For example,

:SYSTem:COMMunicate:LAN: DHCP ON /*Enable DHCP mode*/

:SYSTem:COMMunicate:LAN: DHCP? /*The query returns ON*/

SYSTem:COMMunicate:<network>:DNS

Command format	SYSTem:COMMunicate:<network>:DNS <address> SYSTem:COMMunicate:<network>:DNS?			
Function description	Set the wired network card DNS address. Query DNS address			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
	<address>	ASCII char	0.0.0.0 to 255.255.255.255	--
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns the current name server address in the format nnn.nnn.nnn.nnn			

For example,

SYSTem:COMMunicate:LAN: DNS 202.106.46.151/*Set DNS address to 202.106.46.151*/

SYSTem:COMMunicate:LAN: DNS? /*The query returns 202.106.46.151*/

SYSTem:COMMunicate:<network>:GATEway

Command format	SYSTem:COMMunicate:<network>:GATEway <address> SYSTem:COMMunicate:<network>:GATEway?			
Function description	Set the default gateway. Query the default gateway			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
	<address>	ASCII char	0.0.0.0 to 255.255.255.255	--
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns the current name server address in the format nnn.nnn.nnn.nnn			

For example,

SYSTem:COMMunicate:LAN:GATEway 172.16.3.1/*Set the gateway to 172.16.3.1*/

SYSTem:COMMunicate:<W>LAN:GATEway? /*The query returns 172.16.3.1*/

SYSTem:COMMunicate:<network>:IPADdress

Command format	SYSTem:COMMunicate:<network>:IPADdress <address> SYSTem:COMMunicate:<network>:IPADdress?			
Function description	Set the IP address. Query IP address			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN

	<address>	ASCII char	0.0.0.0到255.255.255.255	--
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns the current name server address in the format nnn.nnn.nnn.nnn			

For example,

SYSTem:COMMunicate:LAN: IPADdress 172.16.3.145/*Set IP address to 172.16.3.145*/

SYSTem:COMMunicate:LAN: IPADdress? /*The query returns 172.16.3.145*/

SYSTem:COMMunicate:<network>:SMASk

Command format	SYSTem:COMMunicate:<network>:SMASk <mask> SYSTem:COMMunicate:<network>:SMASk?			
Function description	Set the subnet mask. Query the subnet mask.			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
	< mask >	ASCII char	0.0.0.0 to 255.255.255.255	--
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns the current name server address in the format nnn.nnn.nnn.nnn			

For example,

SYSTem: COMMunicate: LAN:SMASk 255.255.255.0/*Set the subnet mask to 255.255.255.0*/

SYSTem: COMMunicate: LAN:SMASk? /*The query returns 255.255.255.0*/

SYSTem:COMMunicate:<network>:STATic[:STATe]

Command format	SYSTem:COMMunicate:<network >:STATic:<state> SYSTem:COMMunicate:<network >:STATic ?			
Function description	Turn Manual IP mode on or off. Query the status of the manual IP mode.			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
	<state>	Bool	{OFF|ON}	ON
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns ON or OFF			

For example,

The following command:

:SYSTem:COMMunicate:LAN: STATic ON /*Enable manual IP mode*/

:SYSTem:COMMunicate:LAN: STATic? /*The query returns ON/

SYSTem: COMMunicate: <network>: MAC?

Command format	SYSTem:COMMunicate: <network>:MAC?
Function description	Query the MAC address.

Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Return MAC address			

For example,

:SYSTemCOMMunicate: LAN: MAC? *The query returns 00-11-22-33-44-55*/

SYSTem:COMMunicate:<network>[:STATe]

Command format	SYSTem:COMMunicate:<network >:<state> SYSTem:COMMunicate:<network >?			
Function description	Turn the network card on or off. Query the network card status.			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
	<state>	Bool	{OFF|ON}	ON
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns ON or OFF			

For example,

:SYSTemCOMMunicate: LAN: STATe ON /*Enable manual IP mode*/

:SYSTem: COMMunicate: LAN: STATe? /*The query returns ON*/

:SYSTem:COMMunicate:<network>:RX ?

Command format	SYSTem:COMMunicate:<network>:RX ?			
Function description	Query the total received data of the network card.			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns the cumulative received data, the unit is Byte			

SYSTem:COMMunicate:<network>:TX ?

Command format	SYSTem:COMMunicate:<W>LAN:TX ?			
Function description	Query the total amount of data sent by the network card.			
Parameter	Name	Type	Range	Default
	<network >	Discrete	{WLAN|LAN}	LAN
Description	The machine needs to be equipped with LAN when setting up the LAN The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns cumulative sent data, unit is Byte			

SYSTem:COMMunicate:WLAN:HOTPot[:STATe]

Command format	:SYSTem:COMMunicate:WLAN:HOTPot : STATe <state> :SYSTem:COMMunicate:WLAN:HOTPot : STATe ?

Function description	Enable or disable the WLAN hotspot function. Query whether the current wireless network card works in hotspot mode.			
Parameter	Name	Type	Range	Default
	<state>	Bool	{OFF|ON}	ON
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns ON or OFF			

For example,

SYSTem:COMMunicate:WLAN:HOTPot: STATe ON /*Turn on hotspot mode*/

SYSTem:COMMunicate:WLANHOTPot: STATe? /*The query returns ON*/

SYSTem:COMMunicate:WLAN:HOTPot:KEYMgmt

Command format	:SYSTem:COMMunicate:WLAN:HOTPot:KEYMgmt <safety > :SYSTem:COMMunicate:WLAN:HOTPot:KEYMgmt?			
Function description	Set up WIFI security Query the current security configuration			
Parameter	Name	Type	Range	Default
	<safety >	Discrete	{ NONE|WPAPSK }	NONE
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	The query returns NONE or WPAPSK			

For example,

:SYSTem:COMMunicate: WLAN: HOTPot: KEYMgmt NONE /*Set security to NONE*/

:SYSTem:COMMunicate: WLAN: HOTPot: KEYMgmt? /*The query returns NONE*/

:SYSTem: COMMunicate: WLAN: HOTPot: SSID

Command format	:SYSTem:COMMunicate:WLAN:HOTPot:SSID <name> :SYSTem:COMMunicate:WLAN:HOTPot:SSID?			
Function description	Set wifi hotspot name Query the current wifi hotspot name			
Parameter	Name	Type	Range	Default
	<name>	Char string	Less than 128 pcs	DPO6004B_XXX
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	The query returns the current wifi hotspot name			

For example,

:SYSTem:COMMunicate:WLAN: HOTPot: SSID HELLO /*Set the WIFI hotspot name to: HELLO*/

:SYSTem:COMMunicate:WLAN: HOTPot: SSID? /*The query returns HELLO*/

:SYSTem:COMMunicate:WLAN:HOTPot:PSK

Command format	:SYSTem:COMMunicate:WLAN:HOTPot:PSK <password> :SYSTem:COMMunicate:WLAN:HOTPot:PSK?			
Function description	Set password wifi hotspot, effective when security is set to WPAPSK Query the current wifi hotspot password			
Parameter	Name	Type	Range	Default
	<password>	Char string	Less than 128 pcs	88888888

Description	The machine needs to be equipped with WLAN when setting up WLAN
Return format	The query returns the current wifi hotspot name

For example,

:SYSTem: COMMunicate:WLAN: HOTPot: PSK HELLO /*Set the WIFI hotspot password to: HELLO*/

:SYSTem: COMMunicateWLAN: HOTPot: PSK? /*The query returns HELLO*/

:SYSTem:COMMunicate: WLAN: HOTPot: CHANnel

Command format	:SYSTem:COMMunicate:WLAN:HOTPot:CHANnel <channel> :SYSTem:COMMunicate:WLAN:HOTPot:CHANnel?			
Function description	Set wifi broadcast channel Query the current wifi broadcast channel			
Parameter	Name	Type	Range	Default
	<channel>	Discrete	1~13	11
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	The query returns the current wifi broadcast channel			

For example,

:SYSTem: COMMunicate:WLAN:HOTPot:CHANnel 10 /*Set the WIFI hotspot broadcast channel to 10*/

SYSTem: COMMunicate: WLAN: HOTPot: CHANnel? /*The query returns 10*/

SYSTem: COMMunicate: WLAN: HOTPot: MAXStation

Command format	:SYSTem:COMMunicate:WLAN:HOTPot:MAXStation <number> :SYSTem:COMMunicate:WLAN:HOTPot:MAXStation?			
Function description	Set wifi broadcast channel Query the current wifi broadcast channel			
Parameter	Name	Type	Range	Default
	<number>	Discrete	1~8	8
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	The query returns the current maximum number of wifi connections			

For example

:SYSTem: COMMunicate: WLAN: HOTPot: MAXStation 6 /*Set the maximum number of WIFI hotspot connections to 6 /

:SYSTem: COMMunicate: WLAN: HOTPot: MAXStation? /*The query returns 6*/

:SYSTem: COMMunicate: WLAN: HOTPot: DHCP: RANGe

Command format	SYSTem:COMMunicate:WLAN:HOTPot:DHCP:RANGe <begain>, <end>, <mask> SYSTem:COMMunicate:WLAN:HOTPot:DHCP:RANGe?			
Function description	Set the IP address range assigned by the hotspot. Query the IP address range allocated by the hotspot.			
Parameter	Name	Type	Range	Default
	<begain>	ASCII chars	0.0.0.0 to 255.255.255.255	--
	<end>	ASCII chars	0.0.0.0 to 255.255.255.255	--

	<mask>	ASCII chars	0.0.0.0 to 255.255.255.255	--
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns the current dhcp allocated address range, The format is nnn.nnn.nnn.nnn, nnn.nnn.nnn.nnn, nnn.nnn.nnn.nnn			

For example,

SYSTem: COMMunicate: WLAN: HOTPot: DHCP: RANGe 192.168.1.127, 192.168.1.251, 255.255.255.0/* Set the DHCP address range to 192.168.1.127 to 192.168.1.251 and the subnet mask to 255.255.255.0 * /

SYSTem: COMMunicate: WLAN: HOTPot: DHCP: RANGe? / * The query returns 192.168.1.127, 192.168.1.251, 255.255.255.0 * /

SYSTem:COMMunicate:WLAN:HOTPot:STAtions?

Command format	SYSTem:COMMunicate:WLAN:HOTPot:STAtions?
Function description	Query the number of currently connected users.
Description	The machine needs to be equipped with WLAN when setting up WLAN
Return format	Returns an integer, or 0 when no user is connected

SYSTem:COMMunicate:WLAN:NETWork:SCAN?

Command format	SYSTem:COMMunicate:WLAN:NETWork:SCAN?
Function description	Back to list of scanned wifi hotspots
Description	The machine needs to be equipped with WLAN when setting up WLAN
Return format	"ssid1, keymag1, lvl1", "ssid2, keymag2, lvl2", ..., "ssidn, keymagn, lvln" ssid is the wifi hotspot name keymag means no encryption, if the encrypted keymag is "Encrypted", if it is not encrypted, it is "Open" lvl represents the number of wifi signal grids, the range is 0 to 4

SYSTem:COMMunicate:WLAN:NETWork:LIST?

Command format	SYSTem:COMMunicate:WLAN:NETWork:LIST?
Function description	Back to list of saved wifi hotspots
Description	The machine needs to be equipped with WLAN when setting up WLAN
Return format	"ssid1, pw1, state1", "ssid2, pw2, state2", ..., "ssidn, pwn, staten" ssid is the wifi hotspot name pw stands for wifi password state represents the current state, 0 means not connected, 1 means getting ip, 2 means connected

SYSTem:COMMunicate:WLAN:NETWork:ADD

Command format	SYSTem:COMMunicate:WLAN:NETWork:ADD <ssid>, <psk>			
Function description	Add wifi hotspot to the list of hotspots saved by the system			
Parameter	Name	Type	Range	Default
	<ssid>	ASCII chars	Less than 128	--
	<psk>	ASCII chars	Less than 128	--

Description	The machine needs to be equipped with WLAN when setting up WLAN
Return format	Returns 0 for success, others fail

For example,

SYSTem: COMMunicate: WLAN: NETWork: ADD "hello", "123456" /*Add hotspot "hello", password "123456", add to wifi list*/

SYSTem:COMMunicate:WLAN:NETWork:ENABle

Command format	SYSTem:COMMunicate:WLAN:NETWork:ENABle <ssid>			
Function description	Connect to the wifi hotspot named ssid			
Parameter	Name	Type	Range	Default
	<ssid>	ASCII chars	Less than 128	--
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns 0 for success, others fail			

For example,

SYSTem: COMMunicate: WLAN: NETWork: ENABle "hello" /*command will connect hotspot "hello"*/

SYSTem: COMMunicate: WLAN: NETWork: DISAble

Command format	SYSTem:COMMunicate:WLAN:NETWork:DISAble <ssid>			
Function description	Disconnect the wifi hotspot named ssid			
Parameter	Name	Type	Range	Default
	<ssid>	ASCII chars	Less than 128	--
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns 0 for success, others fail			

For example,

SYSTem: COMMunicate: WLAN: NETWork: DISAble "hello" /*will disconnect hotspot "hello"*/

SYSTem: COMMunicate: WLAN: NETWork: REMOve

Command format	SYSTem:COMMunicate:WLAN:NETWork:REMOve <ssid>			
Function description	The hotspot will be removed from the wifi list saved by the system			
Parameter	Name	Type	Range	Default
	<ssid>	ASCII chars	Less than 128	--
Description	The machine needs to be equipped with WLAN when setting up WLAN			
Return format	Returns 0 for success, others fail			

For example

SYSTem: COMMunicate: WLAN: NETWork: REMOve "hello" /*will remove hotspot "hello" from the wifi list saved by the system*/

:TIMebase Command Subsystem

:TIMebase command is used to set the horizontal system, such as turning on delayed scan, setting the horizontal time base mode, etc.

:TIMebase:WINDow:ENABle

Command format	:TIMebase:WINDow:ENABle <bool> :TIMebase:WINDow:ENABle?			
Function description	Open or close the dual window function, or query the status of the dual window			
Parameter	Name	Type	Range	Default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	The dual window mode can be used to zoom in a section of the waveform horizontally in order to view the waveform details.			
Return format	The query returns 1 or 0.			

For example,

:TIMebase:WINDow:ENABle ON /*Turn on delayed scanning*/

:TIMebase:WINDow:ENABle? /*The query returns 1*/

:TIMebase:WINDow:OFFSet 0

Command format	:TIMebase:DELay:OFFSet <offset> :TIMebase:DELay:OFFSet?			
Function description	Set or query the delay time base offset. The default unit is s.			
Parameter	Name	Type	Range	Default
	<offset>	Integer	-(LeftTime - DelayRange/2) to (RightTime - DelayRange/2)	0
Description	LeftTime = 6 × MainScale-MainOffset RightTime = 6 × MainScale + MainOffset DelayRange = 12 × DelayScale where MainScale is the current main time base scale of the oscilloscope, MainOffset is the current main time base offset of the oscilloscope, and DelayScale is the current delay time of the oscilloscope Base gear.			
Return format	The query returns the delayed time base offset in scientific notation.			

For example,

:TIMebase: WINDow:OFFSet 0.000002 /*Set the delay time base offset to 2μs*/

:TIMebase: WINDow:OFFSet? /*The query returns 2.0000000e-06*/

:TIMebase: WINDow: SCALe

Command format	:TIMebase:WINDow:SCALe <scale> :TIMebase: WINDow:SCALe?			
Function description	Set or query the delay time base. The default unit is s / div.			
Parameter	Name	Type	Range	Default
	<scale>	Integer	Refer to description	500ns/div
Description	The maximum value of the parameter <scale> is the current main time base scale value, and the minimum value is 50 / (current sampling rate × magnification). Among them, the magnification is related to the total number of opened analog channels, analog channels set as trigger sources, and opened digital channel groups (D0 to D7; D8 to D15). When the total number is 1, the magnification is 10; when the total number is 2, the magnification is 20; when the total number is 3 or 4, the magnification is 40. note:			

	— When the opened analog channel is set as the trigger source at the same time, the total number is counted only once. — When one or more channels in the digital channel group D0 to D7 (or D8 to D15) are turned on, the total number is counted once. — In the pattern trigger or duration trigger type, the total number is 4 and the magnification is 40. E.g: — Currently only CH1 is turned on. There is only one trigger source and it is set to CH1. The total number is counted as 1 and the magnification is 10. — Currently only CH1 is turned on, there is only one trigger source and it is set to CH2, the total number is 2 and the magnification is 20. — CH1, CH2, and D0 to D7 are currently turned on. There are two trigger sources and they are set to CH1 and CH2 respectively. The total number is 3 and the magnification is 40. — CH1, D0 to D7, and D8 to D15 are currently turned on. Only one trigger source is set to CH2. The total number is 4 and the magnification is 40. The delayed time base can only take the maximum value and the value obtained by decreasing the maximum value in steps of 1-2-5. If the minimum value calculated according to the above expression is not a settable value, the settable value is taken upward. For example: the current main time base scale is 50ms / div, the sampling rate is 10MSa / s, only CH1 and CH2 are turned on, only one trigger source is set to CH1 (at this time, the magnification is 20). At this time, the maximum value of <scale> is 50ms / div. Calculate the minimum value according to the above expression: 50 / (10M × 20) = 2.5e-7, which is 250ns / div; 250ns / div is not a configurable value, you need to take the configurable value upward, that is, 500ns / div.
Return format	The query returns the delayed time base scale in scientific notation.

For example,

:TIMebase:WINDow: SCALe 0.00000005 /*Set the delay time base to 50ns / div*/

:TIMebase:WINDow: SCALe? /*The query returns 5.0000000e-08*/

:TIMebase [: MAIN]: OFFSet

Command format	:TIMebase[:MAIN]:OFFSet <offset> :TIMebase[:MAIN]:OFFSet?			
Function description	Set or query the main time base offset. The default unit is s.			
Parameter	Name	Type	Range	Default
	<offset>	Integer	Refer to description	0
Description	The range of <offset> is related to the current horizontal time base mode of the oscilloscope (refer to: TIMebase: MODE) and the running status. — YT mode RUN: (-0.5 × MemDepth / SampleRate) to 1s (when the horizontal time base is less than 200ms / div) (-0.5 × MemDepth / SampleRate) to (10 × MainScale) (when the horizontal time base is greater than or equal to 200ms / div, that is			

	"slow Scan mode) STOP: (-MemDepth / SampleRate) to (1s + 0.5 × MemDepth / SampleRate) — Roll mode RUN: This command is not available STOP: (-12 × MainScale) to 0 Among them, MemDepth is the current storage depth of the oscilloscope, SampleRate is the current sampling rate of the oscilloscope, and MainScale is the current main time base scale of the oscilloscope. When the horizontal time base mode is YT and the horizontal time base is 200ms / div or greater (that is, "slow sweep" mode), this command is not available during the oscilloscope stop process.
Return format	The query returns the main time base offset in scientific notation.

For example

:TIMebase:MAIN:OFFSet 0.0002 /*set the main time base offset to 20ms*/

:TIMebase:MAIN:OFFSet? /*The query returns 2.0000000e-04*

:TIMebase [: MAIN]: SCALe 0

Command format	:TIMebase[:MAIN]:SCALe <scale> :TIMebase[:MAIN]:SCALe?			
Function description	Set or query the main time base scale. The default unit is s / div.			
Parameter	Name	Type	Range	Default
	<scale>	Integer	YT mode: 5ns / div to 50s / div, 1-2-5 steps Roll mode: 200ms / div to 50s / div, 1-2-5 steps	1μs/div
Description	When the horizontal time base mode is YT and the horizontal time base is 200ms / div or greater (that is, "slow scan" mode), this command is not available during the oscilloscope stop.			
Return format	The query returns the main time base scale in scientific notation.			

For example

:TIMebase:MAIN:SCALe 0.0002 /*Set the main time base scale to 200μs / div*/

:TIMebase:MAIN:SCALe? /*The query returns 2.0000000e-04*/

:TIMebase:MODE

Command format	:TIMebase:MODE <mode> :TIMebase:MODE?			
Function description	Sets or queries the horizontal time base mode.			
Parameter	Name	Type	Range	Default
	<mode>	Discrete	{MAIN|XY|ROLL}	MAIN
Description	MAIN: YT mode XY: XY mode ROLL: Roll mode			
Return format	The query returns MAIN, XY, or ROLL.			

For example

:TIMebase:MODE XY /*Set the horizontal time base mode to XY mode*/

:TIMebase:MODE? /*The query returns XY*/

:TRIGger Command Subsystem

:TRIGger command is used to set the trigger system of the oscilloscope.

:TRIGger:MODE

Command format	:TRIGger:MODE <mode> :TRIGger:MODE?			
Function description	Select or query the trigger type.			
Parameter	Name	Type	Range	Default value
	<mode>	Discredit	<EDGe|PULSe|VIDeo|SLOPe|TIMeout|WINdows| |INTERVAL|RUNT|DELay|SHOLd|PATTern|UART|LIN|CAN| SPI | IIC>	EDGE
Return format	Return EDGe, PULSe, VIDeo, SLOPe, TIMeout, WINdows, INTERVAL, RUNT, DELay, SHOLd, PATtern, UART, LIN, CAN, SPI, IC			

For example,

:TRIGger:MODE SLOPe /*Set the trigger type to slope trigger*/

:TRIGger:MODE /*The query returns SLOPe*/

:TRIGger:STATus?

Command format	:TRIGger:STATus?
Function description	Query the current trigger status.
Description	TD: Trigger on oscilloscope waveform data. WAIT: The oscilloscope is waiting for the trigger status. RUN: running status of the oscilloscope. AUTO: The oscilloscope runs automatically. STOP: Stop status of the oscilloscope.
Return format	The query returns TD, WAIT, RUN, AUTO or STOP.

For example,

: TRIGger: STATus? / * The query returns STOP * /

:TRIGger: SWEep

Command format	:TRIGger:SWEep <sweep> :TRIGger:SWEep?			
Function description	Set or query the trigger mode.			
Parameter	Name	Type	Range	Default
	<sweep>	Discrete	{AUTO|NORMal|SINGle}	AUTO
Description	AUTO: Automatic triggering, waveform display regardless of whether trigger conditions are met. NORMal: Normal trigger, display the waveform when the trigger condition is met, keep the original waveform display when the trigger condition is not met, and wait for the next trigger. SINGle: Single trigger. The oscilloscope waits for the trigger, displays the waveform when the trigger conditions are met, and then stops.			

Return format	The query returns AUTO, NORM, or SING.

For example,

:TRIGger: SWEep SINGle /*Select single trigger mode*/

:TRIGger: SWEep? /*The query returns SING*/

:TRIGger:HOLDoff

Command format	:TRIGger:HOLDoff <value> :TRIGger:HOLDoff?			
Function description	Set or query the holdoff time. The default unit is s.			
Parameter	Name	Type	Range	Default
	<value>	Integer	8ns to 10s	8ns
Description	Trigger holdoff can stably trigger complex waveforms (such as pulse series). Holdoff time is the time the oscilloscope waits to re-enable the trigger circuit. The oscilloscope will not trigger until the holdoff time is over. When the trigger method is video trigger, timeout trigger, setup hold, UART, LIN, CAN, IIC or SPI, this setting is not available.			
Return format	The query returns the trigger holdoff time in scientific notation.			

For example,

:TRIGger:HOLDoff 0.0000002 /*Set trigger holdoff time to 200ns*/

:TRIGger:HOLDoff? /*The query returns 2.000000e-07*/

:TRIGger:POSition? 0

Command format	:TRIGger:POSition?
Function description	Query the corresponding position of the waveform trigger position in the memory.
Return format	The query returns an integer. A return of -2 means that it is not triggered, that is, there is no trigger position at this time. Returning -1 means triggering outside the memory, that is, the memory data cannot be read from the trigger position at this time. An integer value greater than 0 indicates that the return value is the corresponding position of the trigger position in memory.

For example,

:TRIGger:POSition? /*The query returns 100*/

:TRIGger:EDGe

:TRIGger:EDGe:SOURce

Command format	:TRIGger:EDGe:SOURce <source> :TRIGger:EDGe:SOURce?			
Function description	Set or query the trigger source for edge trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|	CHANnel1

			CHANnel1|CHANnel2|CHANnel3|CHANnel4}	
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:EDGe:SOURce CHANnel1 / * Set the trigger source to CH1 * /

:TRIGger:EDGe:SOURce? / * The query returns CHAN1 * /

:TRIGger:EDGe: SLOPe

Command format	:TRIGger:EDGe:SLOPe <slope> :TRIGger:EDGe:SLOPe?			
Function description	Set or query the edge type of edge trigger.			
Parameter	Name	Type	Range	Default
	<slope>	Discrete	< RISIng|FALLing|EITHer >	RISIng
Description	POSitive: rising edge NEGative: falling edge EITHer: rising or falling edge			
Return format	The query returns POS, NEG or RFAL			

For example,

:TRIGger:EDGe:SLOPe NEGative /*Set the edge type to falling edge*/

:TRIGger:EDGe:SLOPe? /*The query returns NEG*/

: TRIGger: EDGe: LEVel

Command format	:TRIGger:EDGe:LEVel <level> :TRIGger:EDGe:LEVel?			
Function description	Set or query the trigger level when the edge triggers. The unit is the same as the current amplitude unit of the selected source.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5×VerticalScale-OFFSet) to (5× VerticalScale-OFFSet)	0
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	The query returns the trigger level value in scientific notation.			

For example,

:TRIGger:EDGe:LEVel 0.16 /*Set the trigger level to 160mV*/

:TRIGger:EDGe:LEVel? /*The query returns 1.600000e-01*/

:TRIGger:PULSe

:TRIGger:PULSe:SOURce

Command format	:TRIGger:PULSe:SOURce <source> :TRIGger:PULSe:SOURce?

Function description	Set or query the trigger source of the pulse width trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

TRIGger:PULSe:POLarity

Command format	:TRIGger:PULSe:POLarity <polarity> :TRIGger:PULSe:POLarity?			
Function description	Set or query the trigger polarity of pulse width trigger			
Parameter	Name	Type	Range	Default
	<polarity>	Discrete	< POSItive | NEGAtive>	POSItive
Description	POSItive: Positive pulse trigger NEGAtive: negative pulse trigger			
Return format	The query returns POSItive, NEGAtive			

For example,

:TRIGger: PULSe: POLarity POSItive /*Set positive pulse trigger*/

:TRIGger: PULSe: POLarity? /*The query returns POSItive*/

:TRIGger:PULSe:WHEN

Command format	:TRIGger:PULSe:WHEN <when> :TRIGger:PULSe:WHEN?			
Function description	Set or query the trigger conditions for pulse width trigger.			
Parameter	Name	Type	Range	Default
	<when>	Discrete	{ EQUAl| NEQUal| GREAt| LESS }	EQUAl
Description	EQUAl = (equal to time value): Only when the positive or negative pulse width of the input signal is equal to the set pulse width can it trigger. [Pulse width error is 5%] NEQUal! = (Not equal to time value): Only when the positive or negative pulse width of the input signal is not equal to the set pulse width, can the [pulse width error be 5%] be triggered. GREAt ＞ (greater than the time value): Only when the positive or negative pulse width of the input signal is greater than the set pulse width can it trigger [pulse width error is 5%]. LESS <(less than time value): Only when the positive or negative pulse width of the input signal is less than the set pulse width can the [pulse width error be 5%] be triggered.			
Return format	The query returns EQUAl, NEQUal, GRAt, LESS			

For example,

:TRIGger:PULSe:WHEN NLESs /*Set trigger condition to NLESs*/
:TRIGger:PULSe:WHEN? /*The query returns NELS*/

:TRIGger: PULSe: WIDTh

Command format	:TRIGger:PULSe:WIDTh <width> :TRIGger:PULSe:WIDTh?			
Function description	Set or query the pulse width triggering time. The default unit is s.			
Parameter	Name	Type	Range	Default
	<width>	Integer	8ns to 10s	20ns
Description	This command applies to trigger conditions.			
Return format	The query returns the pulse width value in scientific notation.			

For example,
:TRIGger:PULSe:WIDTh 0.000003 /*Set the pulse width value to 3μs*/
:TRIGger:PULSe:WIDTh? /*The query returns 3.000000e-06*/

:TRIGger:PULSe:LEVel1

Command format	:TRIGger:PULSe:LEVel <level> :TRIGger:PULSe:LEVel?			
Function description	Set or query the trigger level when pulse width trigger, the unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet)至 (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	The query returns the trigger level value in scientific notation.			

For example,
:TRIGger:PULSe: LEVel 0.16 /*Set the trigger level to 160mV*/
:TRIGger:PULSe: LEVel? /*The query returns 1.600000e-01*/

:TRIGger:SLOPe

:TRIGger:SLOPe:SOURce

Command format	:TRIGger:SLOPe:SOURce <source> :TRIGger:SLOPe:SOURce?			
Function description	Set or query the trigger source of slope trigger			
Parameter	Name	Type	Range	Default
	<source>	Integer	{CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	Can only be triggered for analog channels			
Return format	The query returns CHAN1, CHAN2, CHAN3, or CHAN4.			

For example,
:TRIGger:SLOPe:SOURce CHANnel2 /*Set trigger source to CH2*/
:TRIGger:SLOPe:SOURce? /*The query returns CHAN2*/

:TRIGger:SLOPe:POLarity

Command format	:TRIGger:SLOPe:POLarity <polarity> :TRIGger:SLOPe:POLarity?			
Function description	Set or query the trigger polarity of the slope trigger			
Parameter	Name	Type	Range	Default
	<polarity>	Integer	< POSItive | NEGAtive>	POSItive
Description	POSItive: Positive slope trigger NEGAtive: negative slope trigger			
Return format	The query returns POSItive, NEGAtive			

For example

:TRIGger:SLOPe:POLarity POSItive /*Set positive slope trigger*/

:TRIGger:SLOPePOLarity? /*The query returns POSItive*/

:TRIGger:SLOPe:WHEN

Command format	:TRIGger:SLOPe:WHEN <when> :TRIGger:SLOPe:WHEN?			
Function description	Set or query the trigger condition of the slope trigger.			
Parameter	Name	Type	Range	Default
	<when>	Discredit	{ EQUAl| NEQUal| GREAt| LESS }	EQUAl
Description	EQUAl = (equal to time value): Only when the positive or negative pulse width of the input signal is equal to the set pulse width can it trigger. [Pulse width error is 5%] NEQUal! = (Not equal to time value): Only when the positive or negative pulse width of the input signal is not equal to the set pulse width, can the [pulse width error be 5%] be triggered. GREAt ＞ (greater than the time value): Only when the positive or negative pulse width of the input signal is greater than the set pulse width can it trigger [pulse width error is 5%]. LESS <(less than time value): Only when the positive or negative pulse width of the input signal is less than the set pulse width can the [pulse width error be 5%] be triggered.			
Return format	The query returns EQUAl, NEQUal, GRAt, LESS			

For example,

:TRIGger:SLOPe:WHEN NLESs /*Set trigger condition to NLESs*/

:TRIGger:SLOPe:WHEN? /*The query returns NLES*/

:TRIGger:SLOPe:TIME0

Command format	:TRIGger:SLOPe:TIME <time> :TRIGger:SLOPe:TIME?			
Function description	Set or query the trigger condition of the slope trigger.			
Parameter	Name	Type	Range	Default
	<time>	Interger	8ns to 10s	20ns

Description	This command applies a trigger condition.
Return format	The query returns the time value in scientific notation.

For example,

:TRIGger:SLOPe:TIME 0.000003 /*Set the time value to 3μs*/

:TRIGger:SLOPe:TIME? /*The query returns 3.000000e-06*/

:TRIGgerSLOPe:WINDow

Command format	:TRIGger:SLOPe:WINDow <window> :TRIGger:SLOPe:WINDow?			
Function description	Sets or queries the vertical window type triggered by the slope.			
Parameter	Name	Type	Range	Default
	<window>	Discrete	{TA|TB|TAB}	TA
Description	TA: Adjust only the upper trigger level. Please refer to the: TRIGger: SLOPe: ALEVel command. TB: Adjust only the lower limit of the trigger level. Please refer to the: TRIGger: SLOPe: BLEVel command. TAB: Adjust the upper and lower trigger levels simultaneously.			
Return format	The query returns TA, TB, or TAB.			

For example,

:TRIGger:SLOPe:WINDow TB /*Set vertical window type to TB*/

:TRIGger:SLOPe:WINDow? /*The query returns TB*/

:TRIGger:SLOPe:ALEVel

Command format	:TRIGger:SLOPe:ALEVel <level> :TRIGger:SLOPe:ALEVel?			
Function description	Set or query the upper limit of the trigger level when the slope triggers. The unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	2V
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	The query returns the trigger level in scientific notation.			

For example,

:TRIGger:SLOPe:ALEVel 0.16 /*Set the trigger level to 160mV*/

:TRIGger:SLOPe:ALEVel? /*The query returns 1.600000e-01*/

:TRIGger:VIDeo

:TRIGger:VIDeo:SOURce

Command format	:TRIGger:VIDeo:SOURce <source> :TRIGger:VIDeo:SOURce?			
Function description	Select or query the trigger source of the video trigger.			
Parameter	Name	Type	Range	Default

	<source>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Return format	The query returns CHAN1, CHAN2, CHAN3, or CHAN4.			

For example,

:TRIGger:VIDeo:SOURce CHANnel2 /*Set trigger source to CH2*/

:TRIGger:VIDeo:SOURce? /*The query returns CHAN2*/

:TRIGger:VIDeo:POLarity

Command format	:TRIGger:VIDeo:POLarity <polarity> :TRIGger:VIDeo:POLarity?			
Function description	Select or query the video polarity when the video is triggered.			
Parameter	Name	Type	Range	Default
	<polarity>	Discrete	{POSitive|NEGative}	POSitive
Return format	The query returns POS or NEG.			

For example

: TRIGger:VIDeo:POLarity POSitive /*Set the video polarity to positive polarity*/

: TRIGger:VIDeo:POLarity? /*Query returns POS*/

:TRIGger:VIDeo:MODE

Command format	:TRIGger:VIDeo:MODE <mode> :TRIGger:VIDeo:MODE?			
Function description	Set or query the synchronization type when the video is triggered.			
Parameter	Name	Type	Range	Default
	<mode>	Discrete	{ODDField|EVENfield|LINE|ALINes}	ALINes
Description	ODDField: Trigger on the rising edge of the first sawtooth wave in the odd field. EVENfield: Trigger on the first rising edge of the sawtooth wave in the even field. LINE: For NTSC and PAL / SECAM video standards, trigger on a specified line in the odd or even field. ALINes: trigger on all horizontal sync pulses.			
Return format	The query returns ODDF, EVEN, LINE, or ALIN.			

For example,

:TRIGger:VIDeo:MODE ODDField /*Set the synchronization type to an odd field*/

:TRIGger:VIDeo:MODE? /*The query returns ODDF*/

:TRIGger:VIDeo:LINE

Command format	:TRIGger:VIDeo:LINE <line> :TRIGger:VIDeo:LINE?			
Function description	Sets or queries the line number when the synchronization type is the specified line when the video is triggered.			
Parameter	Name	Type	Range	Default
	<line>	Integer	Refer to description	1
Description	1 至 525（NTSC） 1 至 625（PAL/SECAM）			

	1 至 525（480P） 1 至 625（576P） 1 至 750（720P） 1 至 1125（1080P/1080i）。
Return format	The query returns an integer.

For example,

:TRIGger:VIDeo:LINE 100 /*Set the line number to 100*/

:TRIGger: VIDeo: LINE? /*The query returns 100*/

:TRIGger:VIDeo:STANdard

Command format	:TRIGger:VIDeo:STANdard <standard> :TRIGger:VIDeo:STANdard?			
Function description	Set or query the video standard of the video trigger.			
Parameter	Name	Type	Range	Default
	<standard>	Integer	{PALSecam|NTSC|480P|576P|720P|1080P|1080I}	NTSC
Description	PALSecam: PAL: The frame rate is 25 frames per second, the TV scan line is 625 lines, the odd field is first, and the even field is rear; SECAM: the frame rate is 25 frames per second, the TV scan line is 625 lines, and interlaced. NTSC: The field frequency is 60 fields per second and the frame rate is 30 frames per second. The TV scan line is 525 lines, with even fields in front and odd fields in back. 480P: Frame rate is 60 frames per second, TV scan line is 525 lines, progressive scan, line frequency is 31.5 kHz. 576P: The frame rate is 60 frames per second, and the TV scan line is 625 lines, progressive scanning. 720P: The frame rate is 60 frames per second, and the TV scan line is 625 lines, progressive scanning. 1080P: The frame rate is 60 frames per second, and the TV scan line is 625 lines, progressive scanning. 1080i: Frame rate is 60 frames per second, TV scan line is 625 lines, progressive scan.			
Return format	The query returns PALS, NTSC, 480P or 576P / 720P, 1080P, 1080i.			

For example,

:TRIGger:VIDeo:STANdard NTSC /*Select NTSC video standard*/

:TRIGger:VIDeo:STANdard? /*The query returns NTSC*/

:TRIGger:VIDeo:LEVel

Command format	:TRIGger:VIDeo:LEVel <level> :TRIGger:VIDeo:LEVel?			
Function description	Set or query the trigger level when the video is triggered. The unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default

	<level>	Integer	(-5 × VerticalScale - OFFSet)至 (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	The query returns the trigger level in scientific notation.			

For example,

:TRIGger: VIDeo: LEVel 0.16 /*Set the trigger level to 160mV*/

:TRIGger: VIDeo: LEVel? /*The query returns 1.600000e-01*/

:TRIGger: TIMeout

:TRIGger:TIMeout:SOURce

Command format	:TRIGger:TIMeout:SOURce <source> :TRIGger:TIMeout:SOURce?			
Function description	Sets or queries the trigger source of the timeout trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:TIMeout: SOURce CHANnel2 /*Set trigger source to CH2*/

:TRIGger:TIMeout: SOURce? /*The query returns CHAN2*/

:TRIGger:TIMeout:SLOPe

Command format	:TRIGger:TIMeout:SLOPe <slope> :TRIGger:TIMeout:SLOPe?			
Function description	Sets or queries the type of edge triggered by the timeout.			
Parameter	Name	Type	Range	Default
	<slope>	Discrete	{POSitive|NEGative|RFALl}	POSitive
Description	POSitive: Start the timing by the trigger level on the rising edge of the input signal. NEGative: Starts timing with the trigger level on the falling edge of the input signal. RFALl: Start timing by trigger level at any edge of the input signal.			
Return format	The query returns POS, NEG, or RFAL.			

For example,

:TRIGger:TIMeout:SLOPe NEGative /*Set edge type to falling edge*/

:TRIGger:TIMeout:SLOPe? /*The query returns NEG*/

:TRIGger:TIMeout:TIMe

Command format	:TRIGger:TIMeout:TIMe <NR3> :TRIGger:TIMeout:TIMe?			
Function description	Sets or queries the timeout period triggered by the timeout. The default unit is s.			
Parameter	Name	Type	Range	Default
	<NR3>	Integer	16ns to 10s	16ns
Return format	The query returns the timeout value in scientific notation.			

For example,

:TRIGger:TIMeout:TIMe 0.002 /*Set the timeout time to 2ms*/

:TRIGger:TIMeout:TIMe? /*The query returns 2.000000e-03*/

TRIGger:TIMeout:LEVel

Command format	:TRIGger:TIMeout:LEVel <level> :TRIGger:TIMeout:LEVel?			
Function description	**: Set or query the trigger level when the timeout triggers**			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet)to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	Returns the trigger level value in scientific notation			

For example

:TRIGger:TIMeout:LEVel 0.16 /*Set trigger level 160mV*/

:TRIGger:TIMeout:LEVel /*The query returns 1.600000e-01*/

:TRIGger:WINDows

:TRIGger:WINDows:SOURce

Command format	:TRIGger:WINDows:SOURce <source> :TRIGger:WINDows:SOURce?			
Function description	Set or query the trigger source triggered by the window.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	Only analog channels can be used as trigger sources.			
Return format	The query returns CHAN1, CHAN2, CHAN3, or CHAN4.			

For example,

:TRIGger:WINDows:SOURce CHANnel2 /*Set trigger source to CH2*/

:TRIGger:WINDows:SOURce? /*The query returns CHAN2*/

:TRIGger:WINDows:ALEVel

Command format	:TRIGger:WINDows:ALEVel <level> :TRIGger:WINDows:ALEVel?

Function description	Set or query the upper limit of the trigger level when the super window is sent. The unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet)至 (5 × VerticalScale - OFFSet)	2V
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	The query returns the upper trigger level in scientific notation.			

For example,

:TRIGger:WINDows:ALEVel 0.16 /*Set the trigger level upper limit to 160mV*/

:TRIGger:WINDows:ALEVel? /*The query returns 1.600000e-01*/

:TRIGger:WINDows:BLEVel

Command format	:TRIGger:WINDows:BLEVel <level> :TRIGger:WINDows:BLEVel?			
Function description	Set or query the lower limit of the trigger level when the amplitude trigger is triggered. The unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet)至 (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	The query returns the lower trigger level in scientific notation.			

For example,

:TRIGger:WINDows:BLEVel 0.05 /*Set the trigger level lower limit to 50mV*/

:TRIGger:WINDows:BLEVel? /*The query returns 5.0000000-02*/

TRIGger:INTERVAl

:TRIGger:INTERVAl:SOURce

Command format	:TRIGger:INTERVAl:SOURce <source> :TRIGger:INTERVAl:SOURce?			
Function description	Set or query the trigger source for interval trigger			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30| D31|D32|D33|D40|D41|D42|D43| CHANnel1|CHANnel2|CHANnel3| CHANnel4}	CHANnel1
Description	Triggered when the interval between two consecutive rising edges (or falling edges) meets the set time condition (<,>, =,! =)			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:INTERVAl:SOURce CHANnel1 /*Set the trigger source to CH1*/

:TRIGger:INTERVAl:SOURce? /*The query returns CHANnel1*/

:TRIGger:INTERVAl:SLOp

Command format	: TRIGger:INTERVAl:SLOp <slope> : TRIGger:INTERVAl:SLOp?			
Function description	Set or query the type of edge triggered by the interval			
Parameter	Name	Type	Range	Default
	<slope>	Discrete	< RISIng| FALLing>	RISIng
Description	: RISIng: rising edge trigger : FALLing: falling edge trigger : DOUBle: Double edge trigger			
Return format	The query returns RISIng, FALLing, DOUBle			

For example,

:TRIGger:INTERVAl:SLOp RISIng /Set the edge type to rising edge*/

:TRIGger:INTERVAl:SLOp? /*The query returns POSItive*/

:TRIGger:INTERVAl:WHEN

Command format	:TRIGger:INTERVAl:WHEN <when> :TRIGger:INTERVAl:WHEN?			
Function description	Set or query the trigger condition of the interval trigger			
Parameter	Name	Type	Range	Default
	<when>	Discrete	< EQUAl| NEQUal| GREAt| LESS>	EQUAl
Description	The interval between two consecutive rising (or falling) edges meets the set time condition(<,>, =,! =)			
Return format	The query returns EQUAl, NEQUal, GRAt, LESS			

For example,

:TRIGger:INTERVAl:WHEN NEQUal /*Set the trigger condition to NEQUal*/

:TRIGger:INTERVAl:WHEN? /*The query returns NEQUal*/

:TRIGger:INTERVAl:TIME

Command format	:TRIGger:INTERVAl:TIME <value> :TRIGger:INTERVAl:TIME?			
Function description	Set or query the time value when the interval is triggered			
Parameter	Name	Type	Range	Default
	<value>	Discrete	8ns-10s）	8ns
Return format	Returns the time value in scientific notation			

For example,

:TRIGger:INTERVAl:TIME 0.000003 /*Set the pulse width value 3us*/

:TRIGger:INTERVAl:TIME? /*The query returns 3.000000e-06*/

:TRIGger:INTERVAl:ALEVel

Command format	:TRIGger:INTERVAl:ALEVel <level> :TRIGger:INTERVAl:ALEVel?			
Function description	Set or query the trigger level for interval trigger			
Parameter	Name	Type	Range	Default
	<level>	Discrete		

Return format	Returns the trigger level value in scientific notation

For example,

:TRIGger:INTERVAl:ALEVel 0.16 /*Set trigger level 160mV*/

:TRIGger:INTERVAl:ALEVel? /*The query returns 1.600000e-01*/

:TRIGger:RUNT

:TRIGger:RUNT:SOURce

Command format	:TRIGger:RUNT:SOURce <source> :TRIGger:RUNT:SOURce?			
Function description	Set or query the trigger source of runt trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{CHANnel1|CHANnel2|CHANnel3| CHANnel4}	CHANnel1
Description	Only analog channels can be used as trigger sources			
Return format	The query returns CHAN1, CHAN2, CHAN3, or CHAN4.			

For example,

:TRIGger:RUNT:SOURce CHANnel2 /*Set the trigger source to CH2*/

:TRIGger:RUNT:SOURce? /*The query returns CHAN2*/

:TRIGger:RUNT:POLarity

Command format	:TRIGger:RUNT:POLarity <polarity> :TRIGger:RUNT:POLarity?			
Function description	Set or query the pulse polarity of runt trigger.			
Parameter	Name	Type	Range	Default
	<polarity>	Discrete	{POSitive|NEGative}	POSitive
Description	POSitive: trigger on a positive runt pulse. NEGative: trigger on negative runt pulses.			
Return format	The query returns POS or NEG.			

For example,

:TRIGger:RUNT:POLarity NEGative /*Set the pulse polarity to negative polarity*/

:TRIGger:RUNT:POLarity? /*The query returns NEG*/

:TRIGger:RUNT:WHEN

Command format	:TRIGger:RUNT:WHEN <when> :TRIGger:RUNT:WHEN?			
Function description	Sets or queries the qualifier for runt trigger.			
Parameter	Name	Type	Range	Default
	<when>	Discrete	{ EQUAl| NEQUal| GREAt| LESS }	EQUAl
Description	EQUAl = (equal to time value): Only when the positive or negative pulse width of the input signal is equal to the set pulse width can it trigger. [Pulse width error is 5%] NEQUal! = (Not equal to time value): Only when the positive or negative pulse width of the input signal is not equal to the set pulse width, can the [pulse width error be 5%] be triggered.			

	GREAt ＞ (greater than the time value): Only when the positive or negative pulse width of the input signal is greater than the set pulse width can it trigger [pulse width error is 5%]. LESS <(less than time value): Only when the positive or negative pulse width of the input signal is less than the set pulse width can the [pulse width error be 5%] be triggered.
Return format	The query returns EQUAl, NEQUal, GRAt, LESS

For example,

:TRIGger:RUNT:WHEN LESS /*Set the qualifier to <*/

:TRIGger:RUNT:WHEN? /*The query returns LESS*/

:TRIGger:RUNT:TIME

Command format	:TRIGger:RUNT:TIME <NR3> :TRIGger:RUNT:TIME?			
Function description	Set or query the trigger time. The default unit is s.			
Parameter	Name	Type	Range	Default
	<NR3>	Integer	8ns to 10s	20ns

For example,

:TRIGger:RUNT:TIME 0.02 /*Set the upper limit of the pulse width to 20ms*/

:TRIGger:RUNT:TIME? /*The query returns 2.000000e-02*/

: TRIGger: RUNT: ALEVel

Command format	:TRIGger:RUNT:ALEVel <level> :TRIGger:RUNT:ALEVel?			
Function description	Set or query the upper limit of the trigger level when the runt pulse is triggered. The unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	2V
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	The query returns the upper trigger level in scientific notation.			

For example,

:TRIGger:RUNT:ALEVel 0.16 /*Set the trigger level upper limit to 160mV*/

:TRIGger:RUNT:ALEVel? /*The query returns 1.600000e-01*/

:TRIGger:RUNT:BLEVel

Command format	:TRIGger:RUNT:BLEVel <level> :TRIGger:RUNT:BLEVel?			
Function description	Set or query the lower limit of the trigger level when the runt pulse is triggered. The unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet)to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the selected source is an analog			

	channel.
Return format	The query returns the lower trigger level in scientific notation.

For example,

:TRIGger:RUNT:BLEVel 0.16 /*Set the trigger level lower limit to 160mV*/

:TRIGger:RUNT:BLEVel? /*The query returns 1.600000e-01*/

:TRIGger:DELay

:TRIGger:DELay: SA

Command format	:TRIGger:DELay:SA <Source> :TRIGger:DELay:SA?			
Function description	Set or query the trigger source of source A when delay trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:DELay:SA CHANnel2 /*Set trigger source A to CH2*/

:TRIGger:DELay:SA? /*The query returns CHAN2*/

:TRIGger:DELay:SLOPA

Command format	:TRIGger:DELay:SLOPA <slope> :TRIGger:DELay:SLOPA?			
Function description	Sets or queries the edge type of edge A when the delay is triggered.			
Parameter	Name	Type	Range	Default
	<slope>	Discrete	{POSitive|NEGative}	POSitive
Description	: POSitive: rising edge trigger : NEGative: falling edge trigger			
Return format	The query returns POS or NEG.			

For example,

:TRIGger:DELay:SLOPA NEGative /*Set the type of edge A to falling edge*/

:TRIGger:DELay:SLOPA? /*The query returns NEG*/

:TRIGger:DELay:SB

Command format	:TRIGger:DELay:SB <source> :TRIGger:DELay:SB?			
Function description	Set or query the trigger source of source B when the trigger is delayed.			
Parameter	Name	Type	Range	Default

	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30| D31|D32|D33|D40|D41|D42|D43| CHANnel1|CHANnel2|CHANnel3| CHANnel4}	CHANnel2
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:DELay: SB CHANnel4 /*Set trigger source B to CH4*/

:TRIGger:DELay:SB? /*The query returns CHAN4*/

:TRIGger:DELay:SLOPB

Command format	:TRIGger:DELay:SLOPB <slope> :TRIGger:DELay:SLOPB?			
Function description	Sets or queries the edge type of edge B when the delay is triggered.			
Parameter	Name	Type	Range	Default
	<slope>	Discrete	{POSitive|NEGative}	POSitive
Description	**: POSitive: rising edge trigger** **: NEGative: falling edge trigger**			
Return format	The query returns POS or NEG.			

For example,

:TRIGger:DELay:SLOPB NEGative /*Set the type of edge B to falling edge*/

:TRIGger:DELay:SLOPB? /*The query returns NEG*/

:TRIGger:DELay:WHEN

Command format	:TRIGger:DELay:WHEN <type> :TRIGger:DELay:WHEN?			
Function description	Set or query the conditions when the delay is triggered.			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{GREater|LESS|GLESs|GOUT}	GREater
Description	EQUAl = (equal to time value): Only when the positive or negative pulse width of the input signal is equal to the set pulse width can it trigger. [Pulse width error is 5%] NEQUal! = (Not equal to time value): Only when the positive or negative pulse width of the input signal is not equal to the set pulse width, can the [pulse width error be 5%] be triggered. GREAt ＞ (greater than the time value): Only when the positive or negative pulse width of the input signal is greater than the set pulse width can it trigger [pulse width error is 5%]. LESS <(less than time value): Only when the positive or negative pulse width of the input signal is less than the set pulse width can the [pulse width error be 5%] be triggered.			
Return format	The query returns EQUAl, NEQUal, GRAt, LESS			

For example,

:TRIGger:DELay: WHEN GOUT /*Set delay type to> <*/

:TRIGger:DELay: WHEN? /*The query returns GOUT*/

:TRIGger:DELay:TIME

Command format	:TRIGger:DELAY:TIME <value> :TRIGger:DELAY:TIME?			
Function description	Set or query the time value when the delay is triggered			
Parameter	Name	Type	Range	Default
	<value>	Discrete	8ns-10s	20ns
Return format	Returns the time value in scientific notation			

For example,

:TRIGger:INTERVAl:TIME 0.000003 /*Set the pulse width value 3us*/

:TRIGger:INTERVAl:TIME? /*The query returns 3.000000e-06*/

:TRIGger:SHOLd

:TRIGger:SHOLd:DSrc

Command format	:TRIGger:SHOLd:DSrc <source> :TRIGger:SHOLd:DSrc?			
Function description	Sets or queries the data source for establishing a hold trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:SHOLd: DSrc CHANnel1 /*Set the data source to CH1*/

:TRIGger:SHOLd: DSrc? /*The query returns CHAN1*/

:TRIGger:SHOLd:CSrc

Command format	:TRIGger:SHOLd:CSrc <source> :TRIGger:SHOLd:CSrc?			
Function description	Set or query the clock source for establishing hold trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|	CHANnel2

			CHANnel3|CHANnel4}	
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:SHOLd:CSrc CHANnel2 /*Set the clock source to CH2*/

:TRIGger:SHOLd:CSrc? /*The query returns CHAN2*/

:TRIGger:SHOLd:SLOPe

Command format	:TRIGger:SHOLd:SLOPe <slope> :TRIGger:SHOLd:SLOPe?			
Function description	Sets or queries the edge type of the establishment hold trigger.			
Parameter	Name	Type	Range	Default
	<slope>	Discrete	{POSitive|NEGative}	POSitive
Description	: POSitive: rising edge trigger :NEGative: falling edge trigger			
Return format	The query returns POS or NEG.			

For example,

:TRIGger:SHOLd:SLOPe NEGative /*Set edge type to falling edge*/

:TRIGger:SHOLd:SLOPe? /*The query returns NEG*/

:TRIGger:SHOLd:PATTern

Command format	:TRIGger:SHOLd:PATTern <pattern> :TRIGger:SHOLd:PATTern?			
Function description	Sets or queries the data type of the establishment hold trigger.			
Parameter	Name	Type	Range	Default
	<pattern>	Discrete	{H|L}	H
Description	H: High level L: Low level			
Return format	The query returns H or L.			

For example,

:TRIGger:SHOLd:PATTern L /*Set the data type to L*/

:TRIGger:SHOLd:PATTern? /*The query returns L*/

:TRIGger:SHOLd:TYPe

Command format	:TRIGger:SHOLd:TYPe <type> :TRIGger:SHOLd:TYPe?			
Function description	Sets or queries the hold type of the hold hold trigger.			
Parameter	Name	Type	Range	Default
	<type>	Discrete	{SETup|HOLd|}	SETup
Description	SETup: Setup. When the setup time is less than the set value (: TRIGger: SHOLd: STIMe), the oscilloscope triggers.			
Return format	HOLd: Hold. When the hold time is less than the set value (: TRIGger: SHOLd: HTIMe), the oscilloscope triggers.			

For example,

:TRIGger:SHOLd:TYPe SETHOLd /*Set the hold type to establish hold*/

:TRIGger:SHOLd:TYPe? /*The query returns SETHOL*/

:TRIGger:SHOLd:STIMe

Command format	:TRIGger:SHOLd:STIMe <NR3> :TRIGger:SHOLd:STIMe?			
Function description	Set or query the setup time of the setup hold trigger. The default unit is s.			
Parameter	Name	Type	Range	Default
	<NR3>	Integer	8ns to 1s	1μs
Description	Settling time is the time that the data remains stable and unchanged before the clock signal of the flip-flop arrives.			
Return format	The query returns the establishment time value in scientific notation.			

For example,

:TRIGger:SHOLd: STIMe 0.002 /*Set the setup time to 2ms*/

:TRIGger:SHOLd: STIMe? /*The query returns 2.000000e-03*/

Related commands

:TRIGger:SHOLd:HTIMe

:TRIGger:SHOLd:HTIMe

Command format	:TRIGger:SHOLd:HTIMe <NR3> :TRIGger:SHOLd:HTIMe?			
Function description	Set or query the hold time of the hold trigger. The default unit is s.			
Parameter	Name	Type	Range	Default
	<NR3>	Integer	8ns to 1s	1μs
Description	The hold time is the time that the data remains stable and unchanged after the clock signal of the flip-flop arrives. This command is applicable to the hold type (refer to the: TRIGger: SHOLd: TYPe command) as HOLd or SETHOLd.			

For example,

:TRIGger:SHOLd:HTIMe 0.002 /*et the hold time to 2ms*/

:TRIGger:SHOLd:HTIMe? /*The query returns 2.000000e-03*/

:TRIGger:SHOLd::WHEN

Command format	:TRIGger:RUNT:WHEN <when> :TRIGger:RUNT:WHEN?			
Function description	Sets or queries the qualifier of the runt trigger.			
Parameter	Name	Type	Range	Default
	<when>	Discrete	{NONE|GREater|LESS|GLESs}	NONE
Description	EQUAl = (equal to time value): Only when the positive or negative pulse width of the input signal is equal to the set pulse width can it trigger. [Pulse width error is 5%] NEQUal! = (Not equal to time value): Only when the positive or negative pulse width of the input signal is not equal to the set pulse width, can the [pulse width error be 5%] be triggered.			

	GREAt ＞ (greater than the time value): Only when the positive or negative pulse width of the input signal is greater than the set pulse width can it trigger [pulse width error is 5%]. LESS <(less than time value): Only when the positive or negative pulse width of the input signal is less than the set pulse width can the [pulse width error be 5%] be triggered.
Return format	The query returns NONE, GRE, LESS, or GLES.

For example,

:TRIGger:RUNT:WHEN LESS /*Set the qualifier to <*/

:TRIGger:RUNT:WHEN? /*The query returns LESS*/

:TRIGger:PATTern

:TRIGger:PATTern: PATTern

Command format	:TRIGger:PATTern:PATTern <pa_ch1>[,<pa_ch2>[,<pa_ch3>[,<pa_ch4>[,<pa_d0>…[,<pa_d15>]]]]] :TRIGger:PATTern:PATTern?			
Function description	Set or query the pattern of each channel when the pattern is triggered.			
Parameter	Name	Type	Range	Default
	<pa_ch1>	Discrete	{H|L|X|}	X
	<pa_ch2>	Discrete	{H|L|X|}	X
	<pa_ch3>	Discrete	{H|L|X|}	X
	<pa_ch4>	Discrete	{H|L|X|}	X
	<pa_D10>	Discrete	{H|L|X|}	C
	…	…	…	…
	<pa_D43>	Discrete	{H|L|X|}	C
Description	Parameters <pa_ch1> to <pa_ch4> set the pattern of the analog channels CH1 to CH4, and parameters <pa_D10> to <pa_D43> set the pattern of the digital channel. The user can send 20 parameters to set the pattern of all channels, or omit some parameters to set the pattern of some channels (the channel is omitted, the pattern status remains the same), but at least one parameter needs to be sent (the parameter sets CH1 Pattern). When less than 20 parameters are sent, the instrument defaults to set CH1 to CH4 and D10 to D43 in turn. In the parameter value range, H means high level (above the threshold level of the channel), L means low level (below the threshold level of the channel), X means ignore this channel (this channel is not part of the pattern, when all channels are set to X, the oscilloscope will not trigger).			
Return format	The query returns the pattern currently set for 4 analog channels or all channels. Multiple channels are separated by commas.			

For example,

:TRIGger:PATTern:PATTern H, R, L, X /*Set the code pattern of CH1 to CH4 to H, R, L, X, the pattern of other channels will not change*/

:TRIGger:PATTern:PATTern? /*The query returns H, R, L, X, X, X, X, X, X, X, X, X, X, X, X, X, X, X, X, X, X*/

:TRIGger:PATTern:LEVel

Command format	:TRIGger:PATTern:LEVel <chan>,<level> :TRIGger:PATTern:LEVel? <chan>			
Function description	Set or query the trigger level of the specified channel when the pattern is triggered. The unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the selected source is an analog channel.			

For example,

:TRIGger:PATTern:LEVel CHANnel2,0.16 /*et the trigger level of CH2 to 160mV*/

:TRIGger:PATTern:LEVel? CHANnel2 /*The query returns 1.600000e-01*/

TRIGger:UART

TRIGger:UART:SOURce

Command format	:TRIGger:UART:SOURce <source> :TRIGger:UART:SOURce?			
Function description	Set or query the trigger source for UART trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:UART:SOURce CHANnel1 /*Set the trigger source to CH1*/

:TRIGger:UART:SOURce? /*The query returns CHANnel1*/

:TRIGger:UART:WHEN

Command format	:TRIGger:UART:WHEN <when> :TRIGger:UART:WHEN?			
Function description	Set or query the trigger conditions for UART trigger.			
Parameter	Name	Type	Range	Default
	<when>	Discrete	< START| STOP| READ_DATA| PARITY_ERR|COM_ERR>	START

Description	STARt: When the UART start bit appears, trigger in the middle of the bit. STOP: When the UART stop bit appears, trigger in the middle of the bit. Regardless of the stop position 1, 1.5, 2 of the device under test, this machine is equipped with 1 bit for processing. READ_DATA: The normal reception of data is completed, and the received UART data and user-set data are equal to trigger at the stop bit. COM_ERR: Data is triggered when an error occurs at the start of the check without stopping the bit. PARITY_ERR: The data is received normally. Triggered at the stop bit when an error occurs in the parity of the data.
Return format	The query returns START | STOP | READ_DATA | PARITY_ERR | COM_ERR

For example,

:TRIGger:UART:CONdition START /*Set the trigger condition to START*/

:TRIGger:UART:CONdition? /*The query returns START*/

:TRIGger:UART:BAUD

Command format	:TRIGger:UART:BAUD <baud_rate> :TRIGger:UART:BAUD?			
Function description	Set or query the baud rate triggered by the UART. The default unit is bps.			
Parameter	Name	Type	Range	Default
	<baud_rate>	Discrete	{110|300|600|1200|2400|4800|9600|19200|38400|57600|115200|230400|460800|USER}	9600
Return format	The query returns an integer or USER.			

For example,

:TRIGger:UART:BAUd 4800 /*Set the baud rate to 4800*/

:TRIGger:UART:BAUd? /*he query returns 4800*/

TRIGger:UART:LEVel

Command format	:TRIGger:UART:LEVel <level> :TRIGger:UART:LEVel?			
Function description	Set or query the trigger level when the UART triggers. The unit is the same as the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the selected source is an analog channel.			
Return format	The query returns the trigger level in scientific notation.			

For example,

:RIGger:UART:ALEVel 0.16 /*Set trigger level 160mV*/

:TRIGger:UART:ALEVel? /*The query returns 1.600000e-01*/

TRIGger:UART:DATA

Command format	:TRIGger:UART:DATA <data> :TRIGger:UART:DATA?			
Function description	Set or query the data value when the UART trigger condition is data.			
Parameter	Name	Type	Range	Default
	<data>	Discrete	0 to 2^n-1	00
Description	n is the current data width, and the value range is 5, 6, 7, or 8.			
Return format	The query returns an integer.			

For example,

:TRIGger:UART:DATA 10 /*Set the data value to 10*/

:TRIGger:UART:DATA? /*The query returns 10*/

TRIGger:UART:WIDTh

Command format	:TRIGger:UART:WIDTh <width> :TRIGger:UART:WIDTh?			
Function description	Sets or queries the data bit width when the UART trigger condition is data.			
Parameter	Name	Type	Range	Default
	<width>	Discrete	{5|6|7|8}	8
Return format	The query returns 5, 6, 7, or 8.			

For example,

:TRIGger:UART:WIDTh 5 /*Set the data bit width to 5*/

:TRIGger:UART:WIDTh? /*The query returns 5*/

TRIGger:UART:STOP

Command format	:TRIGger:UART:STOP <bit> :TRIGger:UART:STOP?			
Function description	Set or query the stop bit when the UART trigger condition is an error frame.			
Parameter	Name	Type	Range	Default
	<bit>	Discrete	{1|2}	1
Return format	The query returns 1 or 2.			

For example,

:TRIGger:UART:STOP 2 /*Set stop bit 2*/

:TRIGger:UART:STOP? /*The query returns 2*/

TRIGger:UART:PARIty

Command format	:TRIGger:UART:PARity <parity> :TRIGger:UART:PARity?			
Function description	Set or query the verification mode when the UART trigger condition is an error frame or a verification error.			
Parameter	Name	Type	Range	Default
	<parity>	Discrete	{EVEN|ODD|NONE}	NONE
Description	When the trigger condition is a verification error, the verification method cannot be set to NONE. At this time, the verification method defaults to odd			

	verification.
Return format	The query returns EVEN, ODD, or NONE.

For example,

:TRIGger:UART:PARIty EVEN /*Set the parity method to even parity*/

:TRIGger:UART:PARIty? /*The query returns EVEN*/

:TRIGger:UART:IDLe

Command format	:TRIGger:UART:IDLe <when> :TRIGger:UART:IDLe?			
Function description	Set or query the idle level triggered by UART			
Parameter	Name	Type	Range	Default
	<when>	Discrete	< HIGH| LOW >	HIGH
Description	HIGH: Idle high LOW: idle low			
Return format	The query returns HIGH, LOW			

For example,

:TRIGger:UART:IDLe HIGH /*Set the idle level to HIGH*/

:TRIGger:UART:IDLe? /*The query returns HIGH*/

:TRIGger:UART:BUSer

Command format	:TRIGger:UART:BUSer <user baud> :TRIGger:UART:BUSer?			
Function description	Set or query the user-defined baud rate when the UART is triggered. The default unit is bps.			
Parameter	Name	Type	Range	Default
	<user baud>	Integer	110 to 20000000	9600
Description	This command works only when the user is set to custom			
Return format	The query returns an integer.			

For example,

:TRIGger:UART:BUSer 50000 /*Custom baud rate is 50000bps*/

:TRIGger:UART:BUSer? /*The query returns 50000*/

Related commands

:TRIGger:RS232:BAUD

:TRIGger:LIN

:TRIGger:LIN:SOURce

Command format	:TRIGger:LIN:SOURce <source> :TRIGger:LIN:SOURce?			
Function description	Set or query the trigger source of the LIN trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22 |D23|D30|D31|D32|D33|D40|D41| D42|D43|CHANnel1|CHANnel2|	CHANnel1

			CHANnel3|CHANnel4}	
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:LIN:SOURce CHANnel1 /*Set the trigger source to CH1*/

:TRIGger:LIN:SOURce? /*The query returns CHANnel1*/

:TRIGger:LIN:IDLe

Command format	:TRIGger:LIN:IDLe <idle> :TRIGger:LIN:IDLe?			
Function description	Set or query the idle level triggered by LIN			
Parameter	Name	Type	Range	Default
	<idle>	Discrete	<LOW | HIGH>	HIGH
Description	HIGH: idle high LOW: idle low			
Return format	The query returns LOW, HIGH			

For example,

:TRIGger:LIN:IDLe LOW /*Set idle low level*/

:TRIGger:LIN:IDLe? /*The query returns LOW*/

:TRIGger:LIN:BAUd

Command format	:TRIGger:LIN:BAUd <baud> :TRIGger:LIN:BAUd?			
Function description	Set or query the baud rate triggered by LIN. The default unit is bps.			
Parameter	Name	Type	Range	Default
	<baud>	Discrete	<110 | 300 | 600 | 1200 | 2400 | 4800 | 9600 | 14400 | 19200 | 38400 | 57600 | 115200 | 230400 | 380400 | 460400 | 921600 | Custom	9600
Return format	The query returns an integer			

For example,

:TRIGger:LIN:BAUd 4800 /*set the baud rate is 4800*/

:TRIGger:LIN:BAUd? /*The query returns 4800*/

:TRIGger:LIN:CONdition

Command format	:TRIGger:LIN:CONdition <condition> :TRIGger:LIN:CONdition?			
Function description	LIN trigger conditions set trigger or queries			
Parameter	Name	Type	Range	Default
	<condition>	Discrete	< INTERVAL_FIELD|SYNC_FIELD|ID_FIELD|	
Description	→ contact field slope interval ends when the edge trigger interval after the end of LIN. Sync field end → LIN sync field data reception completion trigger.			

	End of ID field → LINID field data reception completion trigger. Sync code error → LIN sync field data reception is complete, but the data in the sync field is not equal to 0x55. Frame ID → LINID Field data reception is complete. Triggered when the ID data is equal to the ID set by the user. Frame ID and data → LIN data is received normally, ID and data are both set by the user
Return format	The query returns INTERVAL_FIELD | SYNC_FIELD | ID_FIELD | DATA | IDENTIFIER | ID_DATA

For example,

:TRIGger:LIN:CONdition DATA /*set INTERVAL_END*/

:TRIGger:LIN:CONdition? /*The query returns INTERVAL_END*/

:TRIGger:LIN:ID

Command format	:TRIGger:LIN:ID <id> :TRIGger:LIN:ID?			
Function description	Set or query LIN triggered identifier			
Parameter	Name	Type	Range	Default
	<id>	Discrete	$0\sim2^6-1$ bit	00
Return format	The query returns an integer			

For example,

:TRIGger:LIN:ID 25 /*Set identifier to 25*/

:TRIGger:LIN:ID? /*The query returns 25*/

:TRIGger:LIN:DATA

Command format	:TRIGger:LIN:DATA <index> <data> :TRIGger:LIN:DATA? <index>			
Function description	Set or query data values triggered by LIN.			
Parameter	Name	Type	Range	Default
	<index>	Discrete	0-3	
	<data>	Integer	0~255【XX】	XX
Return format	The query returns an integer			

For example,

:TRIGger:LIN:DATA 2 10 /*Set the data with index 2 to 10*/

:TRIGger:LIN:DATA? 2 /*The query returns 10*/

:TRIGger:LIN:ALEVel

Command format	:TRIGger:LIN:ALEVel <level> :TRIGger:LIN:ALEVel?			
Function description	**: Set or query the trigger level during LIN trigger**			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the channel source of the data line is an analog channel.			

Return format	Returns the trigger level value in scientific notation

For example,

:TRIGger:LIN:ALEVel 0.16 /*Set trigger level 160mV*/

:TRIGger:LIN:ALEVel? /*The query returns 1.600000e-01*/

:TRIGger: CAN

:TRIGger: CAN: SOURce

Command format	:TRIGger:CAN:SOURce <source> :TRIGger:CAN:SOURce?			
Function description	Set or query the trigger source of CAN trigger.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:CAN:SOURce CHANnel1 /*Set the trigger source to CH1*/

:TRIGger:CAN:SOURce? /*The query returns CHANnel1*/

:TRIGger:CAN:IDLe

Command format	:TRIGger:CAN:IDLe <idle> :TRIGger:CAN:IDLe?			
Function description	Set or query the idle level triggered by CAN			
Parameter	Name	Type	Range	Default
	<idle>	Discrete	<LOW | HIGH>	HIGH
Description	HIGH: idle high LOW: idle low			
Return format	The query returns LOW, HIGH			

For example,

:TRIGger:CAN:IDLe LOW /*Set idle low level*/

:TRIGger:CAN:IDLe? /*The query returns LOW*/

:TRIGger:CAN:BAUd

Command format	: TRIGger:CAN:BAUd <baud> : TRIGger:CAN:BAUd?			
Function description	Set or query the baud rate triggered by CAN. The default unit is bps.			
Parameter	Name	Type	Range	Default
	<baud>	Discrete	<10000 | 20000 | 33300 | 50000 | 62500 | 83300 | 100000 | 125000 | 2500 00 | 500000 | 800000 | 1000000 | Custom>	10000

Return format	The query returns an integer

For example,

:TRIGger:CAN:BAUd 4800 /*Set the baud rate to 4800*/

:TRIGger:CAN:BAUd? /*The query returns 4800*/

:TRIGger:CAN:CONdition

Command format	:TRIGger:CAN:CONdition <condition> :TRIGger:CAN:CONdition?			
Function description	**: Set or query the trigger conditions for UART trigger**			
Parameter	Name	Type	Range	Default
	<condition>	Discrete	<FRAM_STARE | FRAM_REMO_ID |FRAM_DATA_ID | REMO/DATA_ID | DATA_ID/DATA|FRAM_REE |FRAM_OVERLOAD | ERR_ALL | ACK_ERR >	
Return format	Query returns FRAM_STARE | FRAM_REMO_ID | FRAM_DATA_ID | REMO / DATA_ID | DATA_ID / DATA | FRAM_REMO_ID_EXT | FRAM_DATA_ID_EXT | REMO / DATA_ID_EXT | DATA_ID / DATA_EXT | FRAM_REE | FRAM_OVERLOAD | ERR_ALL | ACK_ERR			

For example,

:TRIGger:CAN:CONdition FRAM_STARE /*Set FRAM_STARE*/

:TRIGger:CAN:CONdition? /*The query returns FRAM_STARE*/

:TRIGger:CAN:ID

Command format	:TRIGger:CAN:ID <id> :TRIGger:CAN:ID?			
Function description	**: Set or query the IDENTIFIER triggered by CAN**			
Parameter	Name	Type	Range	Default
	<id>	Discrete	0 -- 28	
Return format	The query returns an integer			

For example,

:TRIGger:CAN:ID 25 /*Set IDENTIFIER to 25*/

:TRIGger:CAN:ID? /*The query returns 25*/

:TRIGger:CAN:DLC

Command format	:TRIGger:CAN:DLC <dlc> :TRIGger:CAN:DLC?			
Function description	Set or query the data length code of CAN trigger			
Parameter	Name	Type	Range	Default
	<id>	Discrete		
Description	<dlc> ::= 4 位			

Return format	The query returns an integer

For example,

:TRIGger:CAN:DLC 10 /*Set the data length code to 10*/

:TRIGger:CAN:DLC? /*The query returns 10*/

:TRIGger:CAN:DATA

Command format	:TRIGger:CAN:DATA <index> <data> :TRIGger:CAN:DATA? <index>			
Function description	Set or query CAN trigger data value			
Parameter	Name	Type	Range	Default
	<index>	Discrete	0-3	
	<data>	Integer	0~255【XX】	XX
Return format	The query returns an integer			

For example,
:TRIGger:CAN:DATA 2 10 /*Set the data with index 2 to 10*/
:TRIGger:CAN:DATA? 2 /*The query returns 10*/

:TRIGger:CAN:ALEVel

Command format	: TRIGger:CAN:ALEVel <level> : TRIGger:CAN:ALEVel?			
Function description	**: Set or query the trigger level during CAN trigger**			
Parameter	Name	Type	Range	Default
	<level>	Integer	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the channel source of the data line is an analog channel.			
Return format	Returns the trigger level value in scientific notation			

For example,

:TRIGger:CAN:ALEVel 0.16 /*Set trigger level 160mV*/

:TRIGger:CAN:ALEVel? /*The query returns 1.600000e-01*/

:TRIGger:IIC

:TRIGger:IIC:SDA:SOURce

Command format	:TRIGger:IIC:SDA <source> :TRIGger:IIC:SDA?			
Function description	Set or query the channel source of the I2C triggered data line.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel2
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			

Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.

For example,

:TRIGger:IIC:SDA CHANnel2 /*Set the data source to CH2*/

:TRIGger:IIC:SDA? /*The query returns CHAN2*/

:TRIGger:IIC:SCL:SOURce

Command format	:TRIGger:IIC:SCL <source> :TRIGger:IIC:SCL?			
Function description	Set or query the channel source of the clock line triggered by I2C.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21 |D22|D23|D30|D31|D32|D33| D40|D41|D42|D43|CHANnel1| CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:IIC:SCL CHANnel2 /*Set the clock source to CH2*/

:TRIGger:IIC:SCL? /*The query returns CHAN2*/

:TRIGger: IIC: WHEN

Command format	:TRIGger:IIC:WHEN <trig_type> :TRIGger:IIC:WHEN?			
Function description	Set or query the trigger condition of IIC trigger.			
Parameter	Name	Type	Range	Default
	<trig_type>	Discrete	{STARt|RESTart|STOP|NACKnowledge |ADDRess|DATA|ADATa} < START| STOP| ACK_LOST| ADDR_NO _ACK|RESTART| READ_DATA>	STARt
Description	STARt: trigger when SCL is high and SDA data jumps from high to low. RESTart: trigger when another start condition occurs before the stop condition. STOP: trigger when SCL is high and SDA data jumps from low to high. NACKnowledge: During any acknowledgment of the SCL clock bit, trigger if SDA data is high. ADDRess: Find the set address value and trigger on the read/write bit. DATA: Find the set data value on the data line (SDA), and trigger on the transition edge of the clock line (SCL) corresponding to the last bit of the data. ADATa: Search the set address value and data value at the same time, and trigger when the conditions of "address" and "data" are met at the same time.			
Return format	The query returns STAR, STOP, NACK, REST, ADDR, DATA or ADAT.			

For example,

:TRIGger:IIC:CONdition START /*Set START */

:TRIGger:IIC:CONdition? /*The query returns START*/

TRIGger:IIC:ADDRess

Command format	:TRIGger:IIC:ADDRess <adr> :TRIGger:IIC:ADDRess?			
Function description	Set or query the address value when the IIC trigger condition is an address or address data.			
Parameter	Name	Type	Range	Default
	<adr>	Integer	0 to 2n-1: 0 to 127, 0 to 255 or 0 to 1023	1
Description	In the expression 2n-1, n is the current address bit width.			
Return format	The query returns an integer.			

For example,

:TRIGger:IIC:ADDRess 100 /*Set the address value to 100*/

:TRIGger:IIC:ADDRess? /*The query returns START 100*/

Related commands

:TRIGger:IIC:AWIDth

TRIGger:IIC:DATA

Command format	:TRIGger:IIC:DATA <data> :TRIGger:IIC:DATA?			
Function description	Set or query the data value when the IIC trigger condition is data or address data.			
Parameter	Name	Type	Range	Default
	<data>	Integer	0 to 240-1	82
Description	The settable range of <data> is affected by the byte length setting. The maximum byte length can be set to 5, which is 40-bit binary data. Therefore, the value range of <data> is 0 to 240-1.			
Return format	The query returns an integer.			

For example,

:TRIGger:IIC:DATA 2 10 /* Set the data with index 2 to 10*/

:TRIGger:IIC:DATA? /* The query returns 10*/

:TRIGger:IIC:VALId? <index>

Command format	:TRIGger:IIC:VALId? <index>			
Function description	Set or query IIC trigger data mask			
Parameter	Name	Type	Range	Default
	<data>		:<index> ::= 0—7 :<bool>::= <0|1>	1
Return format	The query returns 0,1.			

For example,

:TRIGger:IIC:VALId 0 1 /* Mask data with index 0 */

:TRIGger:IIC:VALId? 0 /* The query returns 1*/

:TRIGger:IIC:AWIDth

Command format	:TRIGger:IIC:AWIDth <bits> :TRIGger:IIC:AWIDth?			
Function description	Set or query the address bit width when the trigger condition of I2C is address or address data.			
Parameter	Name	Type	Range	Default
	<bits>	Discrete	{7|10}	7
Return format	The query returns 7, 8, or 10.			

For example,

:TRIGger:IIC:AWIDth 10 /* Set the address bit width to 10*/

:TRIGger:IIC:AWIDth? /* The query returns 10*/

:TRIGger:IIC:CLEVel

Command format	:TRIGger:IIC:CLEVel <level> :TRIGger:IIC:CLEVel?			
Function description	Set or query the trigger level of the clock line when I2C triggers. The unit is consistent with the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Real	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the channel source of the clock line is an analog channel.			
Return format	The query returns the trigger level in scientific notation.			

For example,

:TRIGger:IIC:CLEVel 0.16 /* Set the trigger level to 160mV */

:TRIGger:IIC:CLEVel? /* The query returns 1.600000e-01*/

:TRIGger:IIC:DLEVel

Command format	:TRIGger:IIC:DLEVel <level> :TRIGger:IIC:DLEVel?			
Function description	Set or query the trigger level of the data line when I2C triggers, and the unit is consistent with the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Real	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	0
Description	For VerticalScale, please refer to the :CHANnel<n>:SCALe command, and for OFFSet, please refer to the :CHANnel<n>:OFFSet command. This setting command is valid only when the channel source of the data line is an analog channel.			
Return format	The query returns the trigger level in scientific notation.			

For example,

:TRIGger:IIC:DLEVel 0.16 /* Set the trigger level to 160mV*/

:TRIGger:IIC:DLEVel? /* The query returns 1.600000e-01*/

:TRIGger:SPI

TRIGger:SPI:SDA:SOURce

Command format	:TRIGger:SPI:SDA <source> :TRIGger:SPI:SDA?			
Function description	Set or query the channel source of the data line triggered by SPI.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:SPI:SDA CHANnel2 /*Set the channel source of the data line to CH2*/

:TRIGger:SPI:SDA? /*The query returns CHAN2*/

TRIGger:SPI:SCL:SOURce

Command format	:TRIGger:SPI:SCL <source> :TRIGger:SPI:SCL?			
Function description	Set or query the channel source of the clock line triggered by SPI.			
Parameter	Name	Type	Range	Default
	<source>	Discrete	{D10|D11|D12|D13|D20|D21|D22|D23|D30|D31|D32|D33|D40|D41|D42|D43|CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1
Description	When the digital channel is used as the trigger source channel, the digital probe must be connected to the oscilloscope.			
Return format	The query returns D10, D11, D12, D13, D20, D21, D22, D23, D30, D31, D32, D33, D40, D41, D42, D43, CHAN1, CHAN2, CHAN3, CHAN4.			

For example,

:TRIGger:SPI:SCL CHANnel1 /*Set the channel source of the clock line to CH1*/

:TRIGger:SPI:SCL? /*The query returns CHAN1*/

:TRIGger:SPI:SLOPe

Command format	:TRIGger:SPI:SLOPe <slope> :TRIGger:SPI:SLOPe?			
Function description	Set or query the type of clock edge triggered by SPI.			
Parameter	Name	Type	Range	Default
	<slope>	Discrete	{POSitive|NEGative	POSitive
Description	POSitive: SDA data is sampled at the rising edge of the clock. NEGative: SDA data is sampled on the falling edge of the clock.			

Return format	The query returns POS or NEG.

For example,

:TRIGger:SPI:SLOPe POSitive /*Set the clock edge to the rising edge*/

:TRIGger:SPI:SLOPe? /*The query returns POS*/

:TRIGger:SPI:WIDTh

Command format	:TRIGger:SPI:WIDTh <width> :TRIGger:SPI:WIDTh?			
Function description	Set or query the data bit width of the data channel under SPI trigger.			
Parameter	Name	Type	Range	Default
	<width>	Integer	4 to 32	8
Return format	The query returns an integer.			

For example,

:TRIGger:SPI:WIDTh 10 /*设置数据位宽为10*/

:TRIGger:SPI:WIDTh? /*查询返回10*/

Related commands

:TRIGger:SPI:DATA

:TRIGger:SPI:DATA

Command format	:TRIGger:SPI:DATA <data> :TRIGger:SPI:DATA?			
Function description	Set or query the data value triggered by SPI.			
Parameter	Name	Type	Range	Default
	<data>	Integer	0 to 232-1	82
Description	The value range of <data> is related to the current data bit width. The maximum data bit width is 32, so the value range of <data> is 0 to 232-1.			
Return format	The query returns an integer.			

For example,

:TRIGger:SPI:DATA 5 /*Set the data value to 5*/

:TRIGger:SPI:DATA? /*The query returns 5*/

Related commands

:TRIGger:SPI:WIDTh

:TRIGger:SPI:TIMeout

Command format	:TRIGger:SPI:TIMeout <time_value> :TRIGger:SPI:TIMeout?			
Function description	Set or query the timeout time when the trigger condition is timeout under SPI trigger. The default unit is s.			
Parameter	Name	Type	Range	Default
	<time_value>	Integer	100ns to 1s	1μs
Return format	The query returns the timeout time in scientific notation.			

For example,

:TRIGger:SPI:TIMeout 0.001 /*Set the timeout time to 1ms*/

:TRIGger:SPI:TIMeout? /*The query returns 1.000000e-03*/

Related commands

:TRIGger:SPI:WHEN

TRIGger:SPI:CLEVel

Command format	:TRIGger:SPI:CLEVel <level> :TRIGger:SPI:CLEVel?			
Function description	Set or query the trigger level of the clock channel when SPI triggers. The unit is consistent with the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Real	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the channel source of the clock line is an analog channel.			
Return format	The query returns the trigger level in scientific notation.			

For example,

:TRIGger:SPI:CLEVel 0.16 /*Set the trigger level to 160mV*/

:TRIGger:SPI:CLEVel? /*The query returns 1.600000e-01*/

:TRIGger:SPI:DLEVel

Command format	:TRIGger:SPI:DLEVel <level> :TRIGger:SPI:DLEVel?			
Function description	Set or query the trigger level of the data channel during SPI trigger, the unit is consistent with the current amplitude unit.			
Parameter	Name	Type	Range	Default
	<level>	Real	(-5 × VerticalScale - OFFSet) to (5 × VerticalScale - OFFSet)	0
Description	This setting command is valid only when the channel source of the data line is an analog channel.			
Return format	The query returns the trigger level in scientific notation.			

For example,

:TRIGger:SPI:DLEVel 0.16 /*Set the trigger level to 160mV*/

:TRIGger:SPI:DLEVel? /*The query returns 1.600000e-01*/

: WAVeform command subsystem

The :WAVeform command is used to read waveform data and related settings.

:WAVeform:DATA:ALL?

Command format	:WAVeform:DATA:ALL?
Function description	Read waveform data.
Parameter	data[0]-data[1] (2 digits): #9 data[2]-data[10](9 digits):The byte length of the current packet. data[11]-data[19](9 digits): The total length of bytes representing the amount of data. data[20]-data[28](9 digits): The byte length of the uploaded data. data[29](1 digit): Running status 1 means running, 0 means pause. data[30](1 digit) : Trigger status.

	data[31]-data[38] (8 digits): The true value of the sampling time base. data[39-40] (2 digits) : Offset of channel 1 (low order first) data[41-42] (2 digits): Offset of channel 2 (low order first) data[43-44] (2 digits): Offset of channel 3 (low order first) data[45-46] (2 digits): Offset of channel 4 (low order first) data[47]-data[53](7 digit): Voltage of channel 1 data[54]-data[60](7 digits): Voltage of channel 2 data[61]-data[67](7 digits): Voltage of channel 3 data[68]-data[74](7 digits): Voltage of channel 4 data[75] (1 digit): Channel enable 0: Channel 1 and 2 are closed; 1: Only channel 2 opened; 2: Only channel 1 opened; 3: channel 1 and 2 are opened; data[76] (1 digit): Channel enable 0: Channel 3 and 4 are closed; 1: Only channel 4 opened; 2: Only channel 3 opened; 3: Channel 3 and 4 are opened; data[77] (1 digit): Channel enable 0: LA1 and LA2 are closed; 1: Only LA2 opened; 2: Only LA1 opened; 3: LA1 and LA2 are opened; data[78] (1 digit): Channel enable 0: LA3 and LA4 are closed; 1: Only LA4 opened; 2: Only LA3 opened; 3: LA3 and LA4 are opened. data[79]-data[87] (9 digits): Sampling rate. data[88]-data[93] (6digits): Sampling multiple. data[94]-data[101] (8 digits): Display trigger time of current frame. data[102]-data[117] (16 digits): 0 data[118] (1 digit): Trigger level. data[119]-data[126] (8 digits): Trigger point data. data[127] (1 digit):Trigger mode. data[128]-data[x]: Waveform data corresponding to the current data header. Each byte of oscilloscope data represents one point data; Each byte of logic analyzer data represents a channel LA<n> data; the upper 4 bits are invalid;
Return format	Return the waveform data packet containing the data header in the form of a string.

:WAVeform:DATA:DISP?

Command format	:WAVeform:DATA:DISP?
Function description	Obtain waveform display data.
Description	(Description of the first frame read data header) data[0]-data[1] (2 digits): #9 data[2]-data[10](9 digits): The byte length of the current packet. data[11]-data[19](9 digits): The total length of bytes representing the amount of data. data[20]-data[28](9 digits): The byte length of the uploaded data. data[29](1 digit): Running status 1 means running, 0 means pause. data[30](1 digits): Trigger status. data[31]-data[38] (8 digits): The true value of the sampling time base. data[39-40] (2 digits) : Offset of channel 1 (low order first) data[41-42] (2 digits): Offset of channel 2 (low order first) data[43-44] (2 digits): Offset of channel 3 (low order first) data[45-46] (2 digits): Offset of channel 4 (low order first) data[47]-data[53](7 digit): Voltage of channel 1 data[54]-data[60](7 digits): Voltage of channel 2 data[61]-data[67](7 digits): Voltage of channel 3 data[68]-data[74](7 digits): Voltage of channel 4 data[75] (1 digit): Channel enable 0: Channel 1 and 2 are closed; 1: Only channel 2 opened; 2: Only channel 1 opened; 3: channel 1 and 2 are opened; data[76] (1 digit): Channel enable 0: Channel 3 and 4 are closed; 1: Only channel 4 opened; 2: Only channel 3 opened; 3: Channel 3 and 4 are opened; data[77] (1 digit): Channel enable 0: LA1 and LA2 are closed; 1: Only LA2 opened; 2: Only LA1 opened; 3: LA1 and LA2 are opened; data[78] (1 digit): Channel enable 0: LA3 and LA4 are closed; 1: Only LA4 opened; 2: Only LA3 opened; 3: LA3 and LA4 are opened. data[79]-data[87] (9 digits): Sampling rate. data[88]-data[93] (6digits): Sampling multiple. data[94]-data[101] (8 digits): Display trigger time of current frame. data[102]-data[117] (16 digits): 0

	data[118] (1 digit): Trigger level. data[119]-data[126] (8 digits): Trigger point data. data[127] (1 digit): Display mode. (Subsequent frame data description) data[0]-data[1] (2 digits):#9 data[2]-data[10](9 digits):The byte length of the current packet; data[11]-data[19](9 digits): The total length of bytes representing the amount of data; data[20]-data[28](9 digits): The byte length of the uploaded data; data[28]-data[x]: Waveform data corresponding to the current data header. Each byte of oscilloscope data represents one point data; Each byte of logic analyzer data represents a channel LA<n> data; the upper 4 bits are invalid;
Return format	Return the waveform data packet containing the data header in the form of a string.

:LA command subsystem

The :LA command is used to perform related operations on digital channels. This command subsystem is only applicable to MPO6000 and DPO6000 with MPO upgrade option.

:LA:POD<n>:DISPlay

Command format	:LA:POD<n>:DISPlay <bool> :LA:POD<n>:DISPlay?			
Function description	Turn on or off the specified default channel group, or query the status of the specified default channel group.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<bool>	Discrete	{{1|ON}|{0|OFF}}	OFF
Description	A set of 12 digital channels, 34 is a set of digital channels,			
Return format	The query returns 1 or 0.			

For example,

:LA:POD1:DISPlay 1 /*Open POD1 (D0 to D7)*/

:LA:POD1:DISPlay? /*The query returns 1*/

:LA:POD<n>:THReshold

Command format	:LA:POD<n>:THReshold <thre> :LA:POD<n>:THReshold?			
Function description	Set or query the threshold of the specified default channel group, the default unit is V.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3|4}	——
	<thre>	Real type	-7.0V to +7.0V	1.40V
Description	4 default channel groups: D1~D4.			

Return format	The query returns the current threshold of the specified channel group in scientific notation.

For example,

:LA:POD1:THReshold 3.3 /*Set the threshold of POD1 (D0 to D7) to 3.3V*/

:LA:POD1:THReshold? /*The query returns 3.300000e+00*/

[:SOURce[<n>]] command subsystem

The [:SOURce[<n>]] command is used to set the parameters related to the built-in signal source. <n> can be 1, 2 or 3, which means the corresponding built-in signal source channel. When <n> is omitted or :SOURce[<n>], the signal source 1 is operated by default. This command subsystem is only applicable to models with signal source channels in the DPO6000/MPO6000 series.

[:SOURce[<n>]]:OUTPut[<n>][:STATe]

Command format	[:SOURce[<n>]]:OUTPut[<n>][:STATe] <bool> [:SOURce[<n>]]:OUTPut[<n>][:STATe]?			
Function description	Turn on or off the output of the specified signal source channel, or query the output status of the specified signal source channel.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Return format	The query returns OFF or ON。			

For example,

:SOURce1:OUTPut 1 /*Turn on the output of source 1*/

:SOURce1:OUTPut? /*The query returns ON*/

[:SOURce[<n>]]:OUTPut[<n>]:IMPedance

Command format	[:SOURce[<n>]]:OUTPut[<n>]:IMPedance <impedance> [:SOURce[<n>]]:OUTPut[<n>]:IMPedance?			
Function description	Set or query the impedance of the specified signal source channel.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<impedance>	Discrete	{OMEG|FIFTy}	OMEG
Description	OMEG: high resistance; FIFTy: 50Ω;			
Return format	The query returns OMEG or FIFT.			

For example,

:SOURce1:OUTPut:IMPedance FIFTy /*Set the output impedance of source 1 to 50Ω*/

:SOURce1:OUTPut:IMPedance? /*The query returns FIFT*/

[:SOURce[<n>]]:FREQuency[:FIXed]

Command format	[:SOURce[<n>]]:FREQuency[:FIXed] <frequency> [:SOURce[<n>]]:FREQuency[:FIXed]?

Function description	If the specified signal source channel has not been modulated, this command is used to set or query the output frequency of the specified signal source channel; if the specified signal source channel has been modulated, this command is used to set or query the carrier frequency of the specified signal source channel, the default unit is Hz.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<frequency>	Real type	Sine wave: 0.1Hz to 25MHz Square wave: 0.1Hz to 15MHz Pulse: 0.1Hz to 1MHz Ramp wave: 0.1Hz to 100kHz Arbitrary wave: 0.1Hz to 10MH	1kHz
Return format	The query returns the frequency value in scientific notation, such as 2.0000000e+05.			

For example,

:SOURce1:FREQuency 1000 /*Set the output frequency of source 1 to 1kHz*/

:SOURce1:FREQuency? /*The query returns 1.0000000e+03*/

[:SOURce[<n>]]:PHASe[:ADJust]

Command format	[:SOURce[<n>]]:PHASe[:ADJust] <phase> [:SOURce[<n>]]:PHASe[:ADJust]?			
Function description	Set or query the start phase of the specified signal source channel signal, the default unit is degree (°).			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<phase>	Real type	0 to 360	0
Return format	The query returns the starting phase value in scientific notation, such as 0.000000e+00.			

For example,

:SOURce1:PHASe 90 /*Set the start phase of source 1 to 90°*/

:SOURce1:PHASe? /*The query returns 9.000000e+01*/

[:SOURce[<n>]]:PHASe:INITiate

Command format	[:SOURce[<n>]]:PHASe:INITiate			
Function description	Perform the same phase operation.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
Description	Performing the same phase operation, the instrument will reconfigure the			

	second and third channels to output according to the set frequency and phase. For two signals with the same frequency or multiples of frequency, the phase can be aligned by this operation.

For example,

:SOURce1:PHASe INITiate /*Execute the same phase operation for source 1*/

[:SOURce[<n>]]:FUNCtion[:SHAPe]

Command format	[:SOURce[<n>]]:FUNCtion[:SHAPe] <wave> [:SOURce[<n>]]:FUNCtion[:SHAPe]?			
Function description	If modulation is not turned on for the specified signal source channel, this command is used to select or query the output signal waveform. If the specified signal source channel has been modulated, this command is used to select or query the modulated carrier. At this time, if PULSe, NOISe or DC is selected, the modulation function will be automatically turned off.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<wave>	Discrete	{SINusoid|SQUare|RAMP|PULSe|NOISe|DC|EXTernal||SINC|EXPRise|EXPFall|ECG|GAUSs|LORentz|HAVersine}	SINusoid
Description	EXTernal: arbitrary waveform The signal source of MSO1000Z/DS1000Z provides 7 built-in waves: Sinc, exponential rise, exponential fall, electrocardiogram, Gaussian, Lorentz and hassine.			
Return format	The query returns SIN, SQU, RAMP, PULS, NOIS, DC, EXT, SINC, EXPR, EXPF, ECG, GAUS, LOR or HAV.			

For example,

:SOURce1:FUNCtion SQUare /*Set the output waveform of source 1 to square wave*/

:SOURce1:FUNCtion? /*The query returns SQU*/

[:SOURce[<n>]]:FUNCtion:RAMP:SYMMetry

Command format	[:SOURce[<n>]]:FUNCtion:RAMP:SYMMetry <val> [:SOURce[<n>]]:FUNCtion:RAMP:SYMMetry?			
Function description	Set or query the symmetry of the sawtooth wave output by the specified signal source channel, that is, the percentage of the cycle that the sawtooth waveform is in the rising period.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<val>	Real type	0至100	10

Return format	The query returns the current symmetry in scientific notation, such as 5.00000e+01.

For example,

:SOURce1:FUNCtion:RAMP:SYMMetry 50 /*Set the symmetry of the sawtooth wave of source 1 to 50%*/

:SOURce1:FUNCtion:RAMP:SYMMetry? /*The query returns 5.00000e+01*/

[:SOURce[<n>]]:VOLTage[:LEVel][:IMMediate][:AMPLitude]

Command format	[:SOURce[<n>]]:VOLTage[:LEVel][:IMMediate][:AMPLitude] <Amplitude> [:SOURce[<n>]]:VOLTage[:LEVel][:IMMediate][:AMPLitude]?			
Function description	Set or query the amplitude of the output signal of the specified signal source channel, the default unit is Vpp.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<Ampliude>	Real type	Related to the current output impedance High impedance: 20mVpp to 5Vpp 50Ω: 10mVpp to 2.5Vpp	5Vpp
Description	Send [:SOURce[<n>]]:OUTPut[<n>]:IMPedance command to set the output impedance.			
Return format	The query returns the amplitude value in scientific notation, such as 1.0000000e+00.			

For example,

:SOURce1:VOLTage 2 /*Set the output amplitude of source 1 to 2V*/

:SOURce1:VOLTage? /*The query returns 2.0000000e+00*/

[:SOURce[<n>]]:VOLTage[:LEVel][:IMMediate]:OFFSet

Command format	[:SOURce[<n>]]:VOLTage[:LEVel] [:IMMediate]:OFFSet <offset> [:SOURce[<n>]]:VOLTage[:LEVel] [:IMMediate]:OFFSet?			
Function description	Set or query the DC offset of the output signal of the specified signal source channel, the default unit is VDC.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<offset>	Real type	High impedance related to current output impedance and amplitude: (-2.5V + current amplitude/2) to (2.5V-current amplitude/2) 50Ω: (-1.25V + current amplitude/2) to (1.25V-current amplitude /2)	0μVDC

Description	Send [:SOURce[<n>]]:OUTPut[<n>]:IMPedance command to set the output impedance. Send [:SOURce[<n>]]:VOLTage[:LEVel][:IMMediate][:AMPLitude] command to set the current amplitude.
Return format	The query returns the DC offset value in scientific notation, such as 1.0000000e+00.

For example,

:SOURce1:VOLTage:OFFSet 0.5 /*Set the DC offset of source 1 to 500mVDC*/

:SOURce1:VOLTage:OFFSet? /*The query returns 5.0000000e-01*/

[:SOURce[<n>]]:PULSe:DCYCle

Command format	[:SOURce[<n>]]:PULSe:DCYCle <percent> [:SOURce[<n>]]:PULSe:DCYCle?			
Function description	Set or query the duty cycle of the pulse output by the specified signal source channel, that is, the proportion of the high level in a pulse period.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<percent>	Real	10 to 90	20
Return format	The query returns the current duty cycle in scientific notation, such as 5.00000e+01.			

For example,

:SOURce1:PULSe:DCYCle 50 /*Set the duty cycle of source 1 pulse to 50%*/

:SOURce1:PULSe:DCYCle? /*The query returns 5.00000e+01*/

[:SOURce[<n>]]:MOD[:STATe]

Command format	[:SOURce[<n>]]:MOD[:STATe] <bool> [:SOURce[<n>]]:MOD[:STATe]?			
Function description	Turn on or off the modulation of the specified signal source channel, or query the modulation status of the specified signal source channel.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF
Description	The signal source of DPO6000/MPO supports AM, FM.PM, PWM}. Sine wave, square wave, sawtooth wave, built-in wave or arbitrary wave other than DC signal can be used as carrier wave.			
Return format	The query returns OFF or ON.			

For example,

:SOURce1:MOD ON /*Turn on the modulation function of source 1*/

:SOURce1:MOD? /*The query returns ON*/

[:SOURce[<n>]]:MOD:TYPe

Command format	[:SOURce[<n>]]:MOD:TYPe <type> [:SOURce[<n>]]:MOD:TYPe?			
Function description	Set or query the modulation type of the specified signal source channel. Set or query the modulation type of the specified signal source channel.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default.
	<type>	Discrete	{AM|FM|PM|PWM}	AM
Description	AM: amplitude modulation, that is, the amplitude of the carrier changes with the amplitude of the modulating wave. FM: Frequency modulation, that is, the frequency of the carrier changes with the amplitude of the modulating wave. Sine wave, square wave, sawtooth wave, built-in wave or arbitrary wave other than DC signal can be used as carrier wave. You can choose sine wave, square wave, triangle wave or noise as the modulation waveform, send			
Return format	The query returns AM or FM.			

For example,
:SOURce1:MOD:TYPe AM /*Set the modulation type of source 1 to AM*/
:SOURce1:MOD:TYPe? /*The query returns AM*/

[:SOURce[<n>]]:MOD:AM:INTernal:FREQuency

[:SOURce[<n>]]:MOD:FM:INTernal:FREQuency

[:SOURce[<n>]]:MOD:PM:INTernal:FREQuency

[:SOURce[<n>]]:MOD:PWM:INTernal:FREQuency

Command format	[:SOURce[<n>]]:MOD:AM:INTernal:FREQuency <frequency> [:SOURce[<n>]]:MOD:AM:INTernal:FREQuency? [:SOURce[<n>]]:MOD:FM:INTernal:FREQuency <frequency> [:SOURce[<n>]]:MOD:FM:INTernal:FREQuency?			
Function description	Set or query the modulation wave frequency of the specified signal source channel AM modulation or FM modulation, the default unit is Hz.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default.
	<frequency>	Real	1Hz to 50kHz	1kHz
Description	You can send the [:SOURce[<n>]]:MOD:TYPe command to set the modulation type. AM: amplitude modulation, that is, the amplitude of the carrier changes with the amplitude of the modulating wave. FM: Frequency modulation, that is, the frequency of the carrier changes with the amplitude of the modulating wave.			

	You can select sine wave, square wave, triangle wave or noise as the modulation wave, and send [:SOURce[<n>]]:MOD:AM:INTernal:FUNCtion command or [:SOURce[<n>]]:MOD:FM :INTernal:FUNCtion command can be selected.
Return format	The query returns an integer.

For example,

:SOURce1:MOD:AM:INTernal:FREQuency 100 /*Set the AM modulation wave frequency of source 1 to 100Hz*/

:SOURce1MOD:AM:INTernal:FREQuency? /*The query returns 100*/

[:SOURce[<n>]]:MOD:AM:INTernal:FUNCtion

[:SOURce[<n>]]:MOD:FM:INTernal:FUNCtion

Command format	[:SOURce[<n>]]:MOD:AM:INTernal:FUNCtion <wave> [:SOURce[<n>]]:MOD:AM:INTernal:FUNCtion? [:SOURce[<n>]]:MOD:FM:INTernal:FUNCtion <wave> [:SOURce[<n>]]:MOD:FM:INTernal:FUNCtion?			
Function description	Set or query the AM modulation or FM modulation of the specified signal source channel.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default.
	<wave>	Discrete	{SINusoid|SQUare|TRIangle|NOISe}	SINusoid
Description	You can select sine wave (SINusoid), square wave (SQUare), triangle wave (TRIangle) or noise (NOISe) as the modulation wave, you can send [:SOURce[<n>]]:MOD:AM:INTernal:FREQuency or [The :SOURce[<n>]]:MOD:FM:INTernal:FREQuency command sets the frequency of the selected modulating wave. You can send the [:SOURce[<n>]]:MOD:TYPe command to set the modulation type. AM: amplitude modulation, that is, the amplitude of the carrier changes with the amplitude of the modulating wave. FM: Frequency modulation, that is, the frequency of the carrier changes with the amplitude of the modulating wave.			
Return format	The query returns SIN, SQU, TRI or NOIS.			

For example

:SOURce1:MOD:AM:INTernal:FUNCtion SQUare /*Set the AM modulation waveform of source 1 to square wave*/

:SOURce1:MOD:AM:INTernal:FUNCtion? /*The query returns SQU*/

[:SOURce[<n>]]:MOD:AM[:DEPTh]

Command format	[:SOURce[<n>]]:MOD:AM[:DEPTh] <depth> [:SOURce[<n>]]:MOD:AM[:DEPTh]?
Function description	Set or query the AM modulation depth of the specified signal source channel.

	Modulation depth indicates the strength of amplitude modulation, expressed as a percentage.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<depth>	Real type	0 to 120	100
Description	When the modulation depth is 0%, the output amplitude is half the amplitude of the carrier signal. When the modulation depth is 100%, the output amplitude is equal to the carrier signal amplitude. When the modulation depth is greater than 100%, envelope distortion will occur, which must be avoided in the actual circuit. At this time, the output of the instrument will not exceed 5 Vpp (with a load of 50Ω).			
Return format	Query returns an integer			

For example,

:SOURce1:MOD:AM 80 /*Set the AM modulation depth of source 1 to 80%*/

:SOURce1:MOD:AM? /*The query returns 80*/

[:SOURce[<n>]]:MOD:FM[:DEVIation]

Command format	[:SOURce[<n>]]:MOD:FM[:DEVIation] <dev> [:SOURce[<n>]]:MOD:FM[:DEVIation]?			
Function description	Set or query the frequency offset of the FM modulation of the specified signal source channel, the default unit is Hz.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<dev>	Real	0Hz to the currently set carrier frequency	1kHz
Description	You can send the [:SOURce[<n>]]:FREQuency[:FIXed] command to set the carrier frequency, and send the [:SOURce[<n>]]:MOD:FM:INTernal:FREQuency command to set the FM modulation frequency. When the amplitude of the modulating wave reaches the maximum, the frequency of the carrier increases by "frequency offset", when the amplitude of the modulating wave reaches the minimum, the frequency of the carrier decreases by "frequency offset". Only when the designated signal source channel currently selects FM modulation type, the frequency offset of FM modulation can be set.			
Return format	The query returns an integer.			

For example,

:SOURce1:MOD:FM 100 /*Set the frequency offset of source 1FM modulation to 100Hz*/

:SOURce1:MOD:FM? /*The query returns 100*/

[:SOURce[<n>]]:MOD:PM[:DEVIation]

Command format	[:SOURce[<n>]]:MOD:FM[:DEVIation] <dev>

	[:SOURce[<n>]]:MOD:FM[:DEVIation]?			
Function description	Set or query the frequency offset of the FM modulation of the specified signal source channel, the default unit is Hz.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default.
	<dev>	Real	0Hz to the currently set carrier frequency	1kHz
Description	You can send the [:SOURce[<n>]]:FREQuency[:FIXed] command to set the carrier frequency, and send the [:SOURce[<n>]]:MOD:FM:INTernal:FREQuency command to set the FM modulation frequency. When the amplitude of the modulating wave reaches the maximum, the frequency of the carrier increases by "frequency offset", and when the amplitude of the modulating wave reaches the minimum, the frequency of the carrier decreases by "frequency offset". The frequency offset of FM modulation can be set only when the FM modulation type is currently selected for the specified signal source channel.			
Return format	The query returns an integer.			

For example,

:SOURce1:MOD:FM 100 /*Set the frequency offset of source 1FM modulation to 100Hz*/

:SOURce1:MOD:FM? /*The query returns 100*/

[:SOURce[<n>]]:MOD:PWM[:DEVIation]

	[:SOURce[<n>]]:MOD:FM[:DEVIation] <dev> [:SOURce[<n>]]:MOD:FM[:DEVIation]?			
Function description	Set or query the frequency offset of the FM modulation of the specified signal source channel, the default unit is Hz.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default.
	<dev>	Real	0Hz to the currently set carrier frequency	1kHz
Description	You can send the [:SOURce[<n>]]:FREQuency[:FIXed] command to set the carrier frequency, and send the [:SOURce[<n>]]:MOD:FM:INTernal:FREQuency command to set the FM modulation frequency. When the amplitude of the modulating wave reaches the maximum, the frequency of the carrier increases by "frequency offset", and when the amplitude of the modulating wave reaches the minimum, the frequency of the carrier decreases by "frequency offset". The frequency offset of FM modulation can be set only when the FM modulation type is currently selected for the specified signal source channel.			
Return format	The query returns an integer.			

For example,

:SOURce1:MOD:FM 100 /*Set the frequency offset of source 1FM modulation to 100Hz*/
:SOURce1:MOD:FM? /*The query returns 100*/

[:SOURce[<n>]]:APPLy?

Command format	[:SOURce[<n>]]:APPLy?			
Function description	Query the current output configuration of the specified signal source channel.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
Return format	Return the current output configuration in the format of "<wave name>,<frequency>,<amplitude>,<offset>,<start phase>". If there is no corresponding parameter, replace it with DEF			

For example,
:SOURce1:APPLy? /*The query returns SIN,1000.000000,1.000000,0.000000,0.000000*/

[:SOURce[<n>]]:BURST:CONT

Command format	[:SOURce[<n>]]:PULSe:DCYCle <percent> [:SOURce[<n>]]:PULSe:DCYCle?			
Function description	Set or query the duty cycle of the pulse output by the specified signal source channel, that is, the proportion of the high level in a pulse period.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default.
	<percent>	Real	10 to 90	20
Return format	The query returns the current duty cycle in scientific notation, such as 5.00000e+01.			

For example
:SOURce1:PULSe:DCYCle 50 /*Set the duty cycle of source 1 pulse to 50%*/
:SOURce1:PULSe:DCYCle? /*The query returns 5.00000e+01*/

[:SOURce[<n>]]:BURST:SOURE

Command format	[:SOURce[<n>]]:PULSe:DCYCle <percent> [:SOURce[<n>]]:PULSe:DCYCle?			
Function description	Set or query the duty cycle of the pulse output by the specified signal source channel, that is, the proportion of the high level in a pulse period.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default.
	<percent>	Real	10 to 90	20
Return format	The query returns the current duty cycle in scientific notation, such as 5.00000e+01.			

For example
:SOURce1:PULSe:DCYCle 50 /*Set the duty cycle of source 1 pulse to 50%*/
:SOURce1:PULSe:DCYCle? /*The query returns 5.00000e+01*/

[:SOURce[<n>]]:APPLy:NOISe

[:SOURce[<n>]]:APPLy:PULSe

[:SOURce[<n>]]:APPLy:RAMP

[:SOURce[<n>]]:APPLy:SINusoid

[:SOURce[<n>]]:APPLy:SQUare

[:SOURce[<n>]]:APPLy:USER

Command format	[:SOURce[<n>]]:APPLy:NOISe [<amp>[,<offset>]] [:SOURce[<n>]]:APPLy:PULSe [<freq>[,<amp>[,<offset>[,<phase>]]]] [:SOURce[<n>]]:APPLy:RAMP [<freq>[,<amp>[,<offset>[,<phase>]]]] [:SOURce[<n>]]:APPLy:SINusoid [<freq>[,<amp>[,<offset>[,<phase>]]]] [:SOURce[<n>]]:APPLy:SQUare [<freq>[,<amp>[,<offset>[,<phase>]]]] [:SOURce[<n>]]:APPLy:USER [<freq>[,<amp>[,<offset>[,<phase>]]]]			
Function description	Configure the specified signal source channel to output a signal with the specified waveform and parameters.			
Parameter	Name	Type	Range	Default
	[<n>]	Discrete	{1|2|3}	When omitted, it will operate on source 1 by default
	<freq>	Real	Sine wave: 0.1Hz to 25MHz Square wave: 0.1Hz to 15MHz Pulse: 0.1Hz to 1MHz Ramp wave: 0.1Hz to 100kHz Arbitrary wave: 0.1Hz to 10MHz	1kHz
	<amp>	Real	Related to the output impedance currently set High impedance: 20mVpp to 5Vpp 50Ω: 10mVpp to 2.5Vpp	5Vpp
	<offset>	Real	High impedance related to current output impedance and amplitude: (-2.5V + current amplitude/2) to (2.5V-current amplitude/2) 50Ω: (-1.25V + current amplitude/2) to (1.25V-current amplitude /2)	0μVDC
	<phase>	Real	0°to 360°	0°
Description	This series of commands is used to select the waveform shape. NOISe: noise PULSe: pulse RAMP: sawtooth wave SINusoid: sine wave SQUare: square wave USER: Arbitrary wave. Frequency <freq>: set the frequency of the specified waveform (noise does not have this parameter), the default unit is Hz; <amp>: set the specified waveform Amplitude, the default unit is Vpp; <offset>: set the DC offset of the specified waveform, the default unit is VDC; <phase>: set the starting phase of the			

	specified waveform (no noise has this parameter), the default unit is degree (°). This series of commands allows users to omit one or more parameters. When all the parameters are omitted, this series of commands only configures the specified signal source channel as the specified waveform, and does not modify the corresponding parameters. The four parameters <freq>, <amp>, <offset>, and <phase> are sequential. This series of commands cannot omit the previous parameters and directly set the following parameters, that is, you cannot omit <freq> and directly set <amp>.

[:TRACe[<n>]]命令子系统

The [:TRACe[<n>]] command is used to set the arbitrary waveform related parameters of the built-in signal source. <n> can be 1, 2 or 3, which means the corresponding built-in signal source channel. When <n> or :TRACe[<n>] is omitted, signal source 1 is operated by default.

[:TRACe[<n>]]:DATA:DAC16

Command format	[:TRACe[<n>]]:DATA:DAC16 volatile,<flag>,<binary_block_data>			
Function description	Download the binary data block to the volatile memory of the specified signal source.			
Parameter	Name	Type	Range	Default
	<n>	Discrete	{1|2|3}	1
	<flag>	Discrete	{END}	——
	<binary_block_data>	Please refer to the description		
Description	This command consists of two parts, one part is a command string, including "[:TRACe[<n>]]:DATA:DAC16 volatile,<flag>,", and the other part is binary data, including "<binary_block_data>". <flag> indicates the status of data transmission, and can only be set to END, which indicates the end of data transmission. <binary_block_data> represents the binary data to be downloaded, and the data length ranges from 4Bytes (2pts) to 32kBytes (16kpts). <binary_block_data> is a binary data block beginning with the # sign, for example: "#516384 binary data", the "5" after the "#" sign indicates that the data length information (ie 16384) occupies a total of 5 characters; "16384" indicates the follow-up The number of bytes of binary data. Each waveform point corresponds to a binary number of two bytes (the adjustable range is 0000 to 3FFF, 0000 and 3FFF respectively correspond to the minimum and maximum values of the current waveform amplitude), so the number of bytes must be an even number. When receiving the data transmission end mark END, the instrument automatically switches to arbitrary waveform output.			

Chapter 3 Programming Examples

This chapter gives examples of programming examples of how to use commands to implement

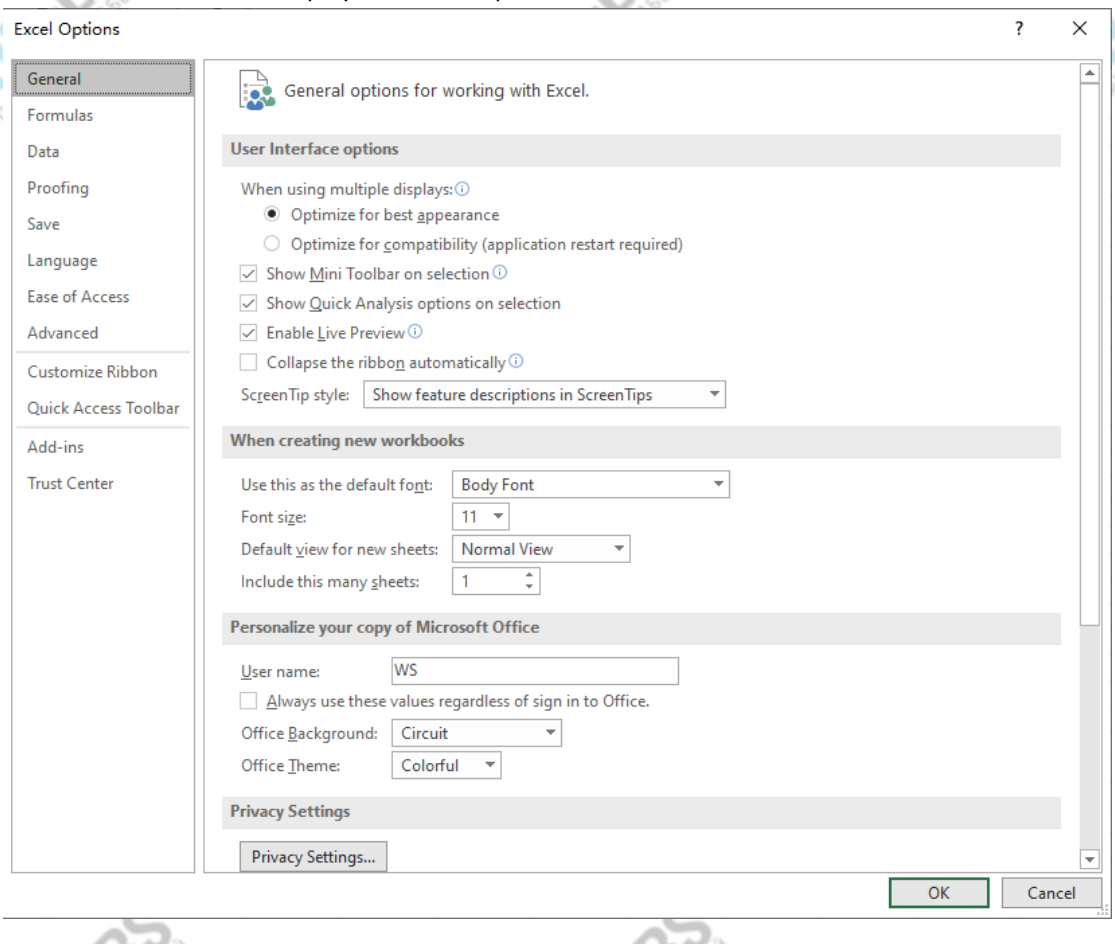
common oscilloscope functions in the development environments of Excel, Matlab, LabVIEW, Visual Basic 6.0 and Visual C++ 6.0. These examples are based on VISA (Virtual Instrument Software Architecture) library programming.

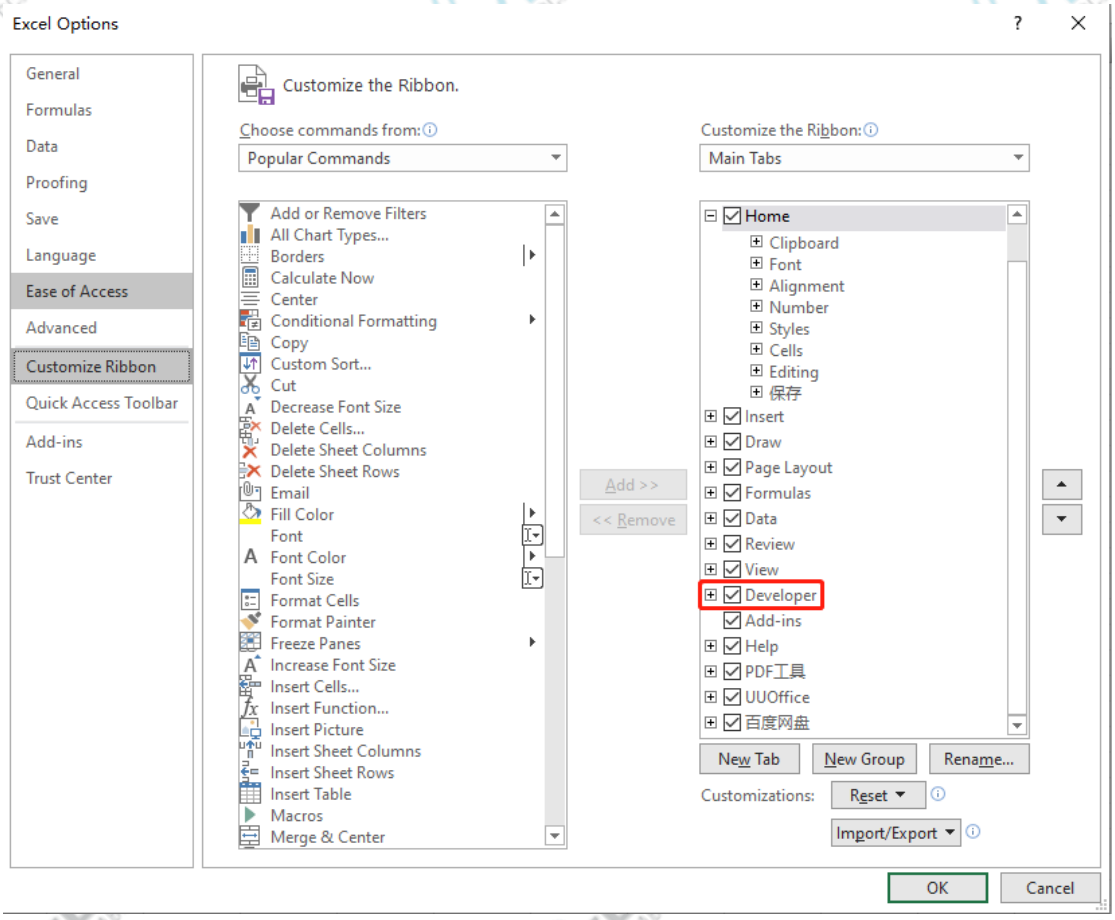
Programming preparation

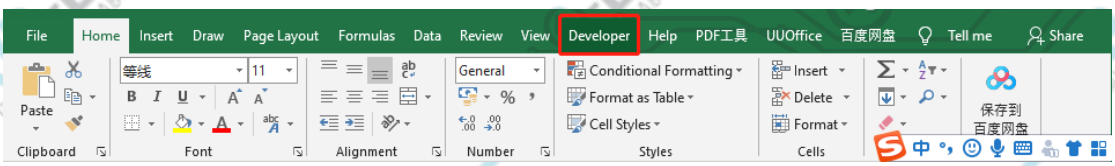
Before programming, you need to do the following preparations:
Please install Keysight IO general software first. You can download the software from the Keysight official website, and then follow the instructions to install it. After installing Keysight IO, the VISA library has been installed automatically.
This article uses the USB interface of the oscilloscope to communicate with the PC. Please use the USB data cable to connect the USB Device interface on the rear panel of the oscilloscope to the PC. After the oscilloscope is correctly connected to the PC, turn on the power of the instrument and turn it on. The USBDevice icon appears in the right corner of the oscilloscope.

Excel programming example

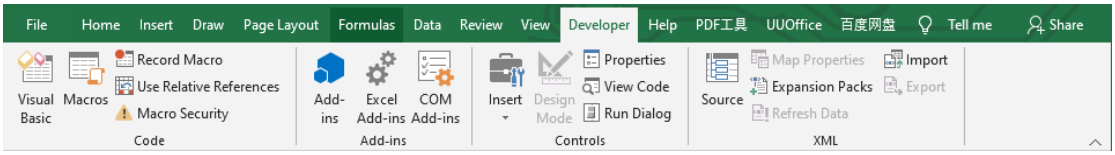
Program used in this example: Microsoft Excel 2016 Function implemented in this example: Send *IDN? command to read device information.
1) Create a new macro-enabled Excel file, named MPO6000_Demo.xlsx in this example.
2) Run the MPO6000_Demo.xlsx file, click the file button in the upper left corner of the Excel file, click "Options" to open the interface as shown in the figure below, select the custom function area, and check the "Development Tools" in the custom function area, Click "OK." At this time, the Excel menu bar will display the "Development Tools" menu.



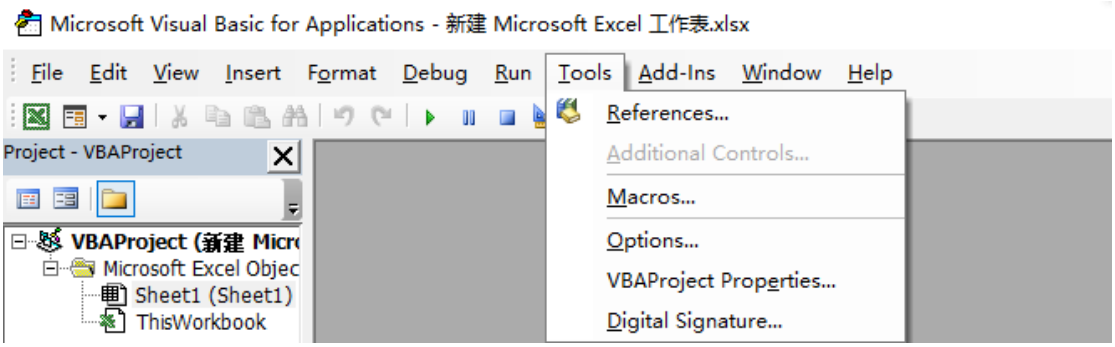




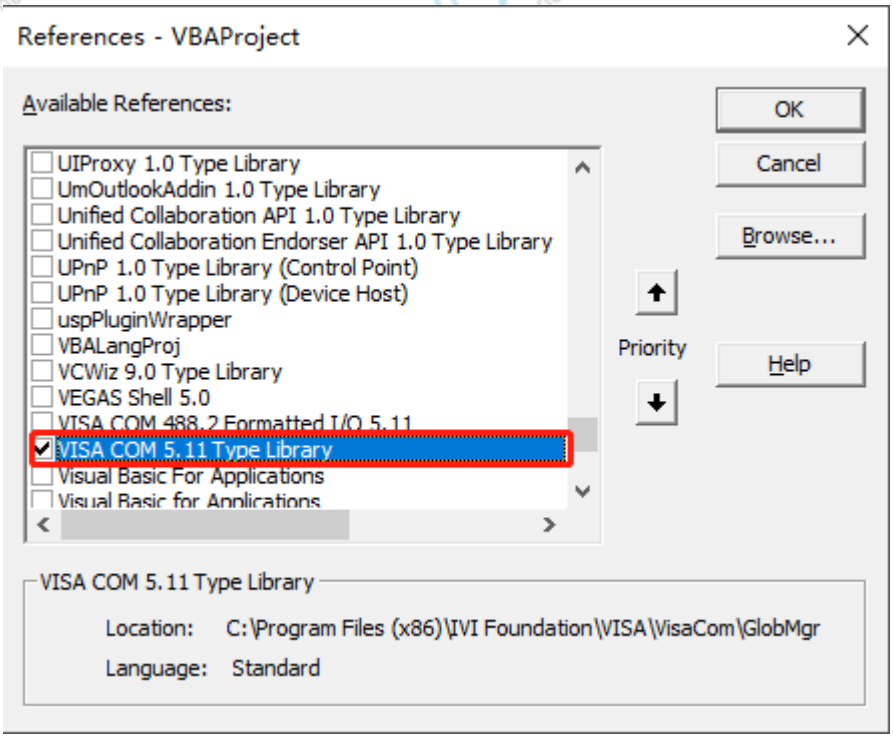
3) Click the "Development Tools" menu and select the Visual Basic option to open Microsoft Visual Basic.



4) Select "Tools (T)" on the menu bar of the Visual Basic page and click "Reference (R)".



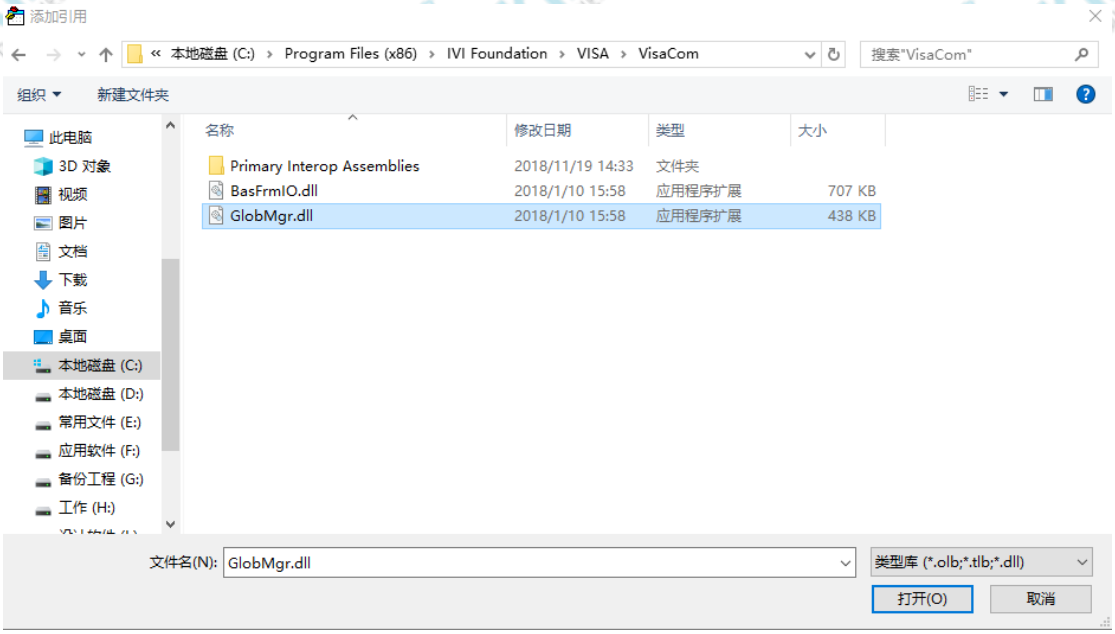
Select VISA COM 5.9 Type Library in the pop-up dialog box, and click the OK button to reference VISA Library.



Note: If you cannot find the VISA Library in the list on the left side of the figure above, please find it as follows:

(1) Please make sure that the VISA library has been installed on your computer.

(2) Click "Browse (B)..." on the right to search, the search scope is C:\Program Files (x86)\IVI Foundation\VISA\VisaCom, the file name is GlobMgr.dll, as shown in the figure below.

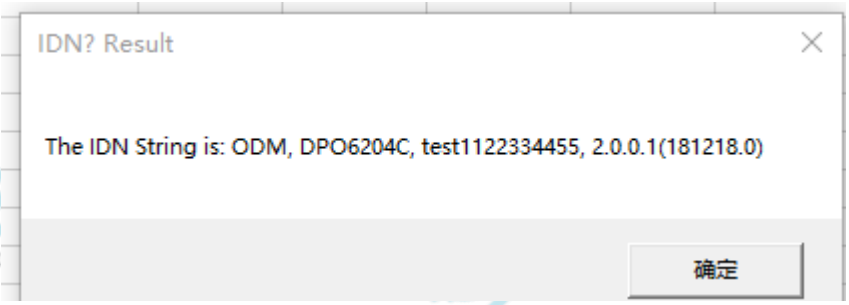


5) Click "View Code" under the "Development Tools" menu to enter the Microsoft Visual Basic page, add the following code and save it.

```
Private Sub CreateResource()
    On Error GoTo errorhandler
    Dim rm As VisaComLib.ResourceManager
```

```
        Dim session As VisaComLib.IMessage
        Dim status As Long
        Dim idn As String
  ' Instantiate the Global Resource Manager
  Set rm = New VisaComLib.ResourceManager
  ' Open the session with the default values for the Lock (None), Timeout(N/A),
  ' and Option String ("""). The return value is an IVisaSession, but the
  ' session variable is an IMessage interface reference, causing an implicit
  ' IUnknown::QueryInterface() to occur. VB handles the details.
  Set session = rm.Open("USB0::0x049F::0x505E::test1122334455::0::INSTR ")
  session.WriteString "*IDN?" & vbLf
  idn = session.ReadString(1000)
        MsgBox "The IDN String is: " & idn, vbOKOnly, "IDN? Result"
  Exit Sub
errorhandler:
        MsgBox Err.Description, vbExclamation, "Error Occurred", Err.HelpFile, Err.HelpContext
End Sub
```

6) Click Run to display the following dialog box:

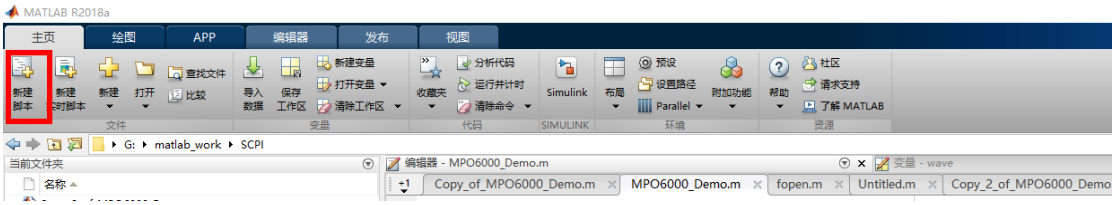


Matlab programming example

Program used in this example: MATLAB R2018a Function implemented in this example: read CH1 waveform data for FFT calculation, and draw the waveform.

1. Run the Matlab software and modify the current path. In this example, modify the current path to G:\matlab_work\SCPI\MPO6000_Demo.

2. Click New Script on the Matlab interface to create a blank M file.



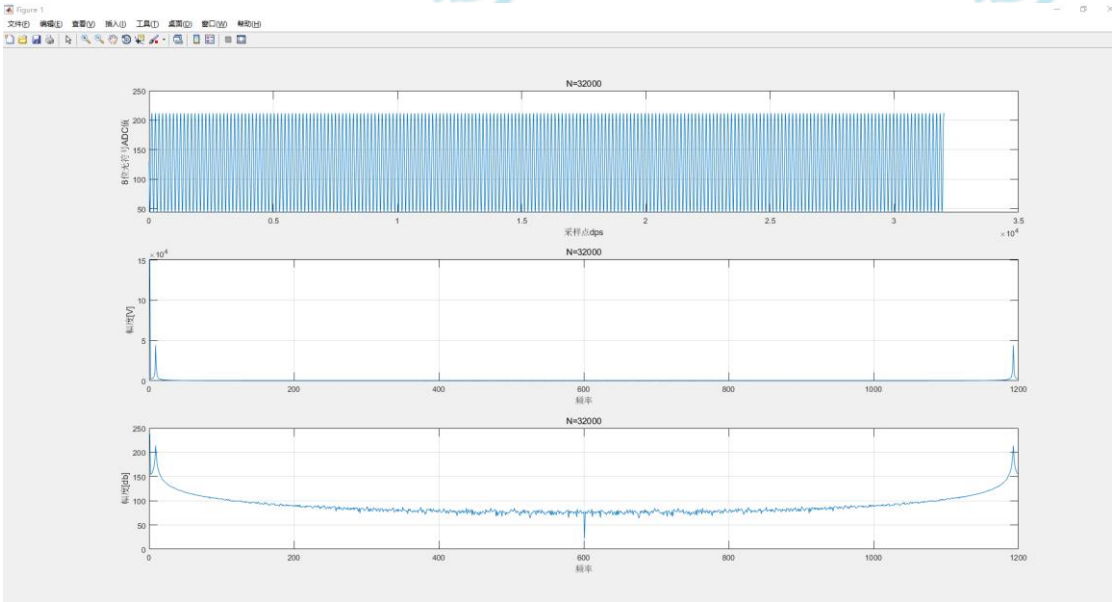
3. Add the following code in the M file:

```
%Create VISA object
MPO6000 = visa('KEYSIGHT', 'USB0::0x049F::0x505E::test1122334455::0::INSTR');
% Set device properties. In this example, set the length of the input buffer to 4096
MPO6000.InputBufferSize = 40000;
% Turn on the MPO6000 device
fopen(MPO6000);
% Read oscilloscope acquisition parameters
fprintf(MPO6000, ':wav:data:all?' );
% Request data
[data,len]= fread(MPO6000,4096    );
% The processing length of the waveform parameter data header is 128 bytes,
tmc_head =strcat(data(1:2)') ;% data[0]-data[1] (2 digits): Data header #9
cur_len = strcat(data(3:11)');% data[2]-data[10] (9 digits): Indicates the byte length of the current data packet
tot_len = strcat(data(12:20)');% data[11]-data[19] (9 digits): The total length of bytes indicating the amount of data
send_len = strcat(data(21:29)');% data[20]-data[28] (9 digits): Indicates the byte length of the uploaded data
run_state = strcat(data(30)');% data[29] (1 digit): Indicates the current running status 0 is paused 1 is running
trig_state = strcat(data(31)');% data[30] (1 digit): Indicates the state of the trigger 0 is no valid trigger 1 is valid trigger
ch1_offset = strcat(data(32:35)');% data[31]-data[34] (4 digits): Indicates the offset of channel 1
ch2_offset = strcat(data(36:39)');% data[35]-data[38] (4 digits): Indicates the offset of channel 2
ch3_offset = strcat(data(40:43)');% data[39]-data[42] (4 digits): Indicates the offset of channel 3
ch4_offset = strcat(data(44:47)');% data[43]-data[46] (4 digits): Indicates the offset of channel 4
CH1_voltage = strcat(data(48:54)');% data[47]-data[53] (7 digits): Indicates the voltage of channel 1 Back to the scientific and technological law unit is UV
CH2_voltage = strcat(data(55:61)');% data[54]-data[60] (7 digits): Indicates the voltage of channel 2 Back to the scientific and technological law unit is UV
CH3_voltage = strcat(data(62:68)');% data[61]-data[67] (7 digits): Indicates the voltage of channel 3 Back to the scientific and technological law unit is UV
CH4_voltage = strcat(data(69:78)');% data[68]-data[74] (7 digits): Indicates the voltage of channel 4 Back to the scientific and technological law unit is UV
ch_enabled = strcat(data(76:79)');% data[75]-data[78] (4 digits): Indicates the status of the channel. See instructions for details
sampling_rate = strcat(data(79:88)');% data[79]-data[87] (9 digits): Indicates the sampling rate
extract_len = strcat(data(89:94)');% data[88]-data[93] (6 digits): indicates the sampling multiple
trig_time = strcat(data(95:103)');% data[94]-data[102] (9 digits): Display trigger time of current frame
start_time = strcat(data(104:112)');% data[103]-data[111] (9 digits): The start time point of the acquisition start point of the current frame display data
Reserve_data = strcat(data(113:128)');% data[112]-data[127] (16 digits): reserved
% The data read later is valid waveform data
send_len_data=str2num(send_len); % String converted to number
```

```
cur_len_data=str2num(cur_len); % String converted to number
tot_len_data=str2num(tot_len); % String converted to number
data_len=1;
while( send_len_data+cur_len_data<tot_len_data)% Determine whether the reading is over
% Issued to read the waveform
fprintf(MPO6000, ':wav:data:all?' );
% Request data
[data,len]= fread(MPO6000,4096);
% Wave data header split
tmc_head =strcat(data(1:2)') ;% data[0]-data[1] (2 digits): Data header #9
cur_len = strcat(data(3:11)');% data[2]-data[10] (9 digits): Indicates the byte length of the current data
packet
tot_len = strcat(data(12:20)');% data[11]-data[19] (9 digits): The total length of bytes indicating the
amount of data
send_len = strcat(data(21:29)');% data[20]-data[28] (9 digits): Indicates the byte length of the
uploaded data
send_len_data=str2num(send_len);
cur_len_data=str2num(cur_len);
tot_len_data=str2num(tot_len);
for i=30:1:len
        wave(data_len,1)=data(i);
    data_len=data_len+1;
end
end
% Turn off the device
fclose(MPO6000);
delete(MPO6000);
clear MPO6000;
subplot(311)
plot(wave);
xlabel('Sampling point dps');
ylabel('8-bit unsigned ADC value ');title('N=32000');grid on;
fftSpec = fft(wave',1200);
fftRms = abs(fftSpec');
fftLg = 20*log(fftRms);
subplot(312);
plot(fftRms);
xlabel(' frequency ');
ylabel(' Amplitude [V]');title('N=32000');grid on;
subplot(313);
plot(fftLg);
xlabel(' frequency ');
ylabel(' Amplitude [db]');title('N=32000');grid on;
```

4. Save the M file in the current path. The M file in this example is named MPO6000_Demo.m.

5. Run the M file and display the following results:

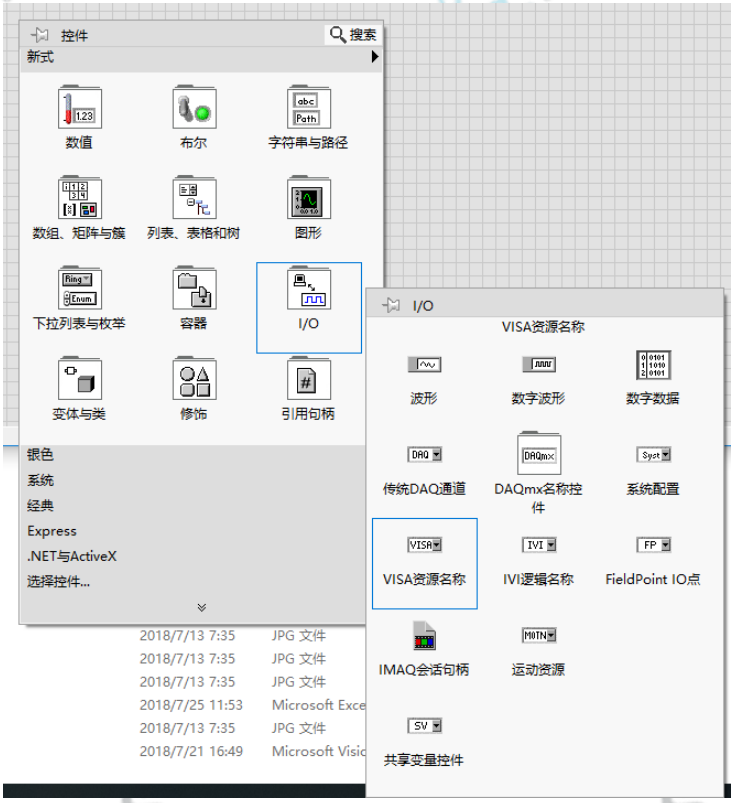


LabVIEW programming examples

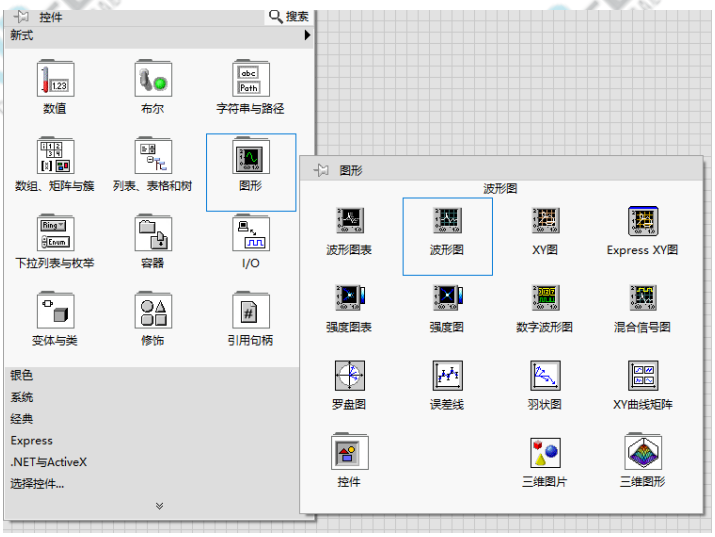
The program used in this example: LabVIEW 2017 The function implemented in this example: read the screen waveform data of CH1.

1. Run LabVIEW 2017 and create a new VI file named MPO6000_Demo.

2. Add controls. Right-click on the front panel interface and select the VISA resource name in I/O, as shown in the following figure:

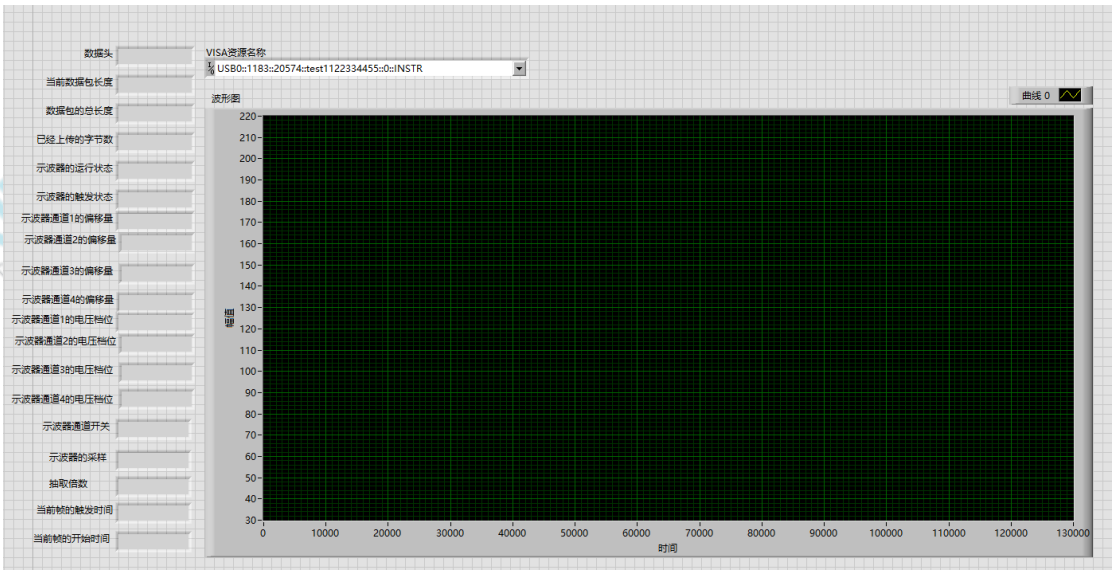


3. Add controls. Right-click on the front panel interface and select the waveform in I/O as shown in the following figure:

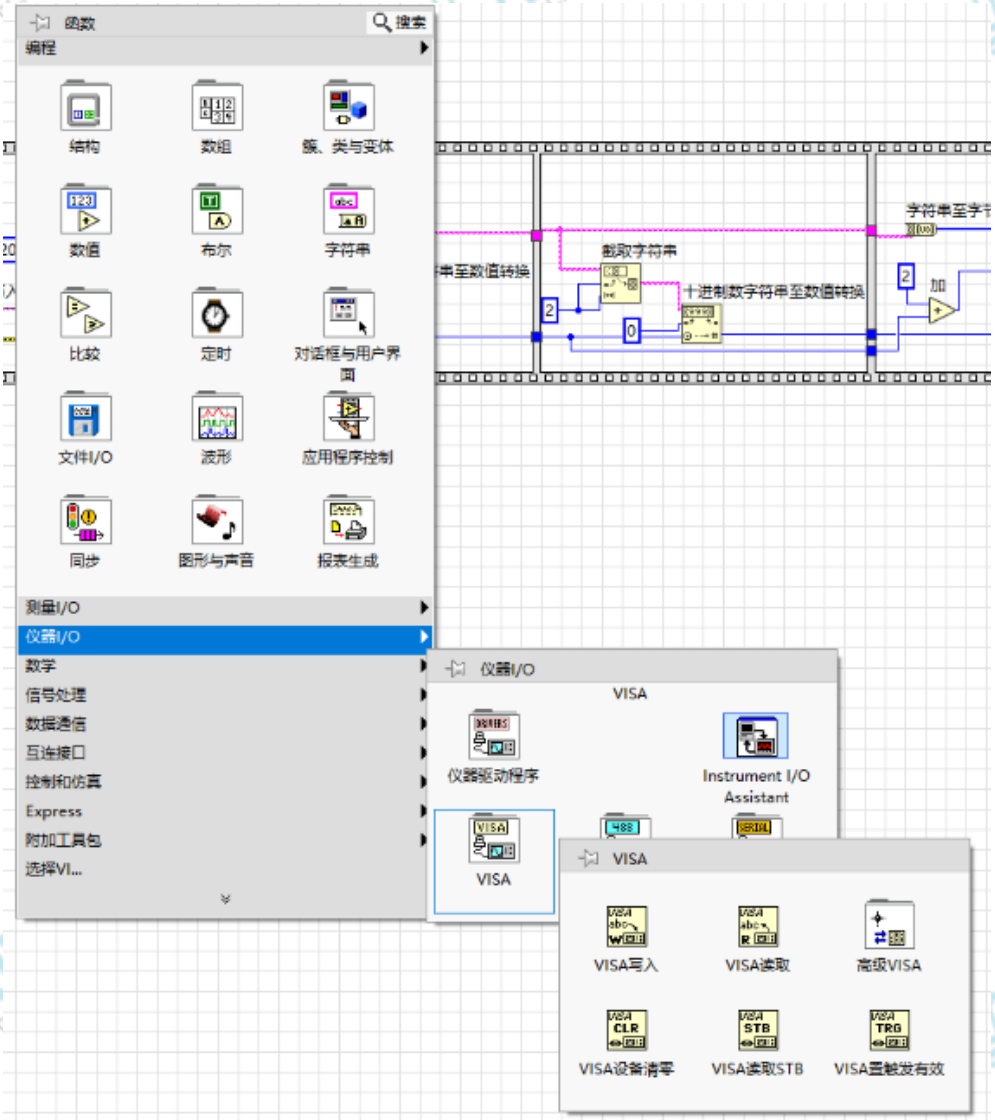


4. Create multiple digital display controls for parsing data headers.

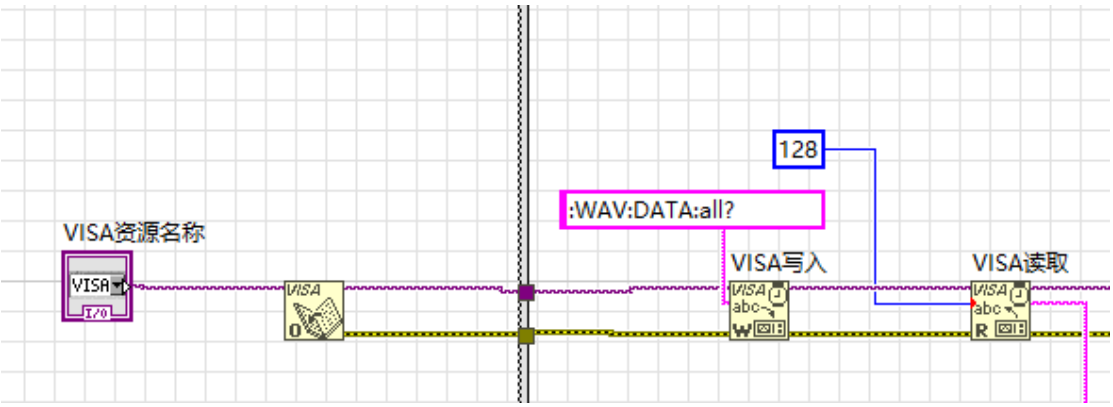
5. Complete the space addition as shown in the following figure:



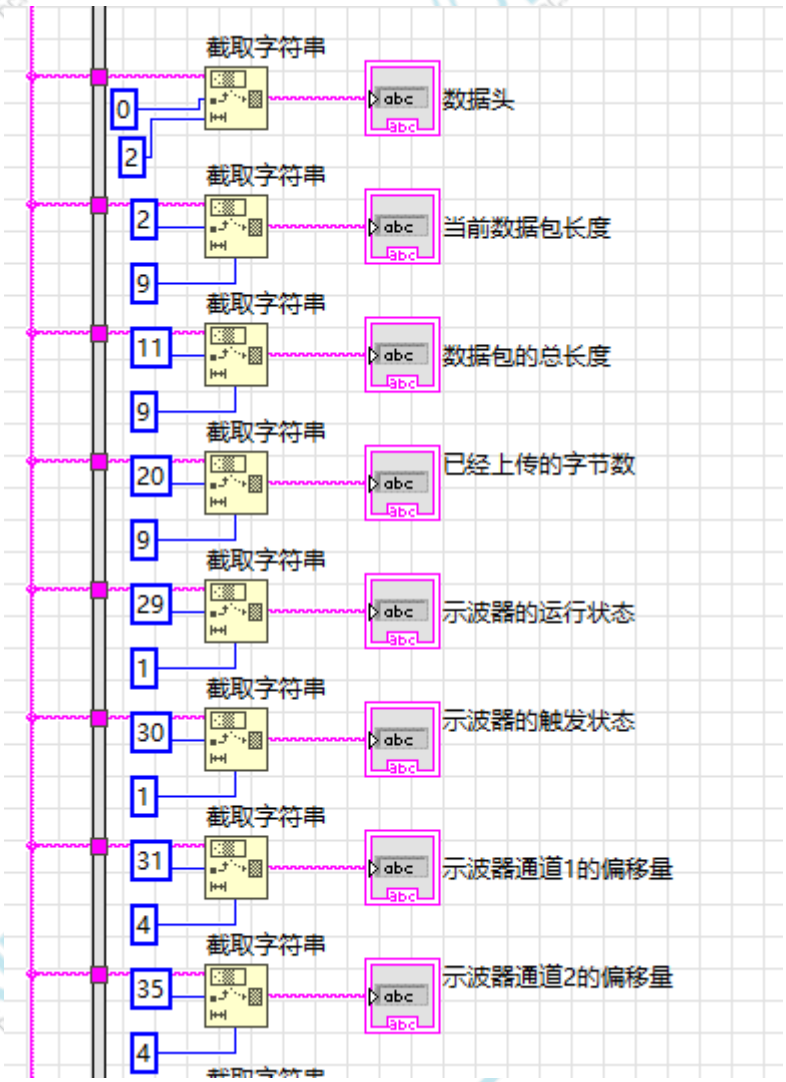
6. Open the block diagram panel, select instrument I/O VISA to add the following functions respectively, VISA write, VISA read, VISA open, VISA close functions.



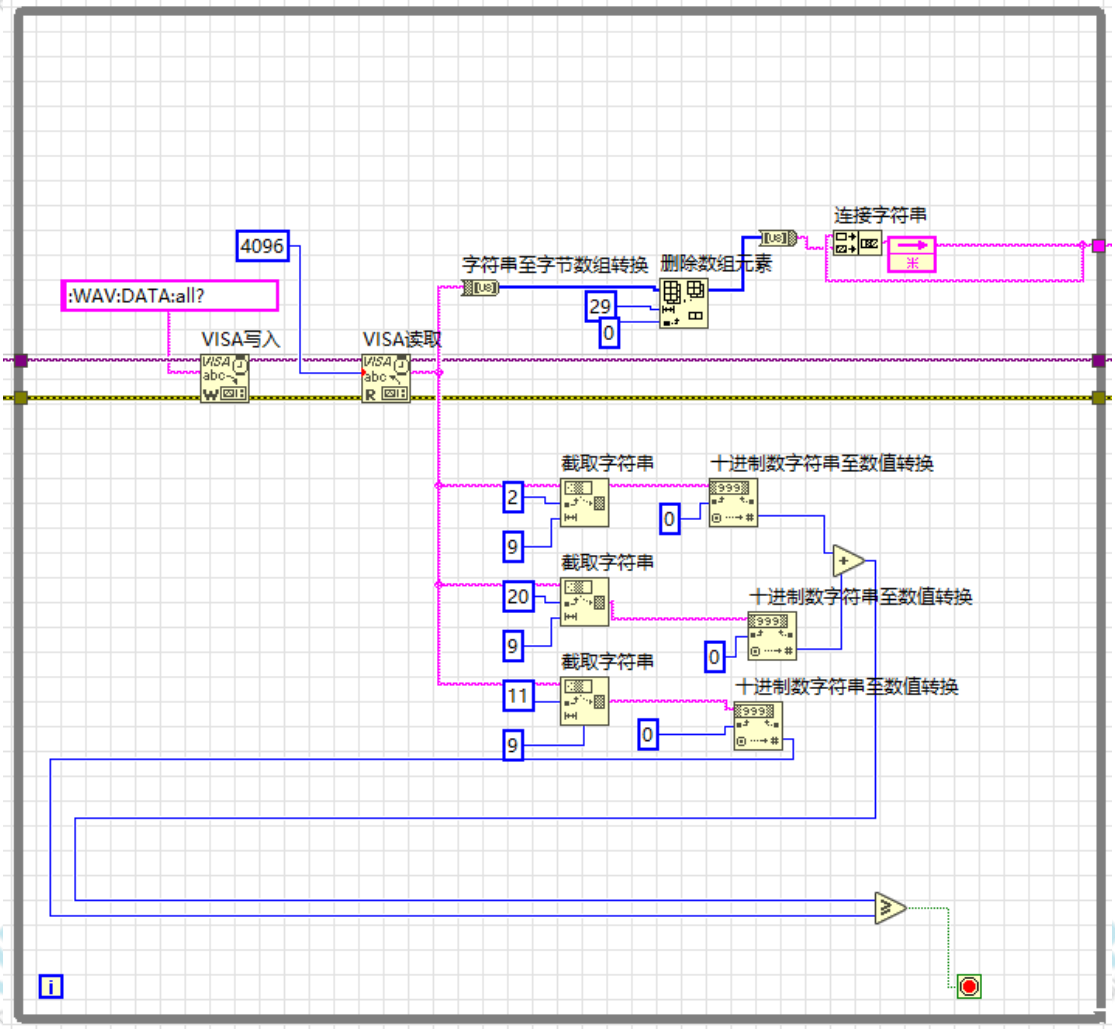
7. Connect the VISA resource name and VISA Open, and add the read header data, as shown in the following figure:



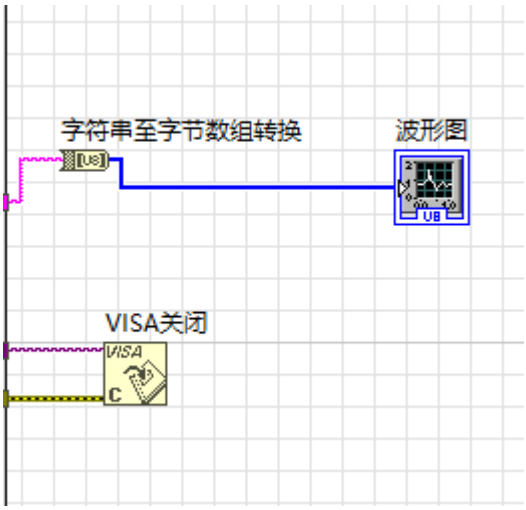
8. Add data header data analysis processing, as shown below:



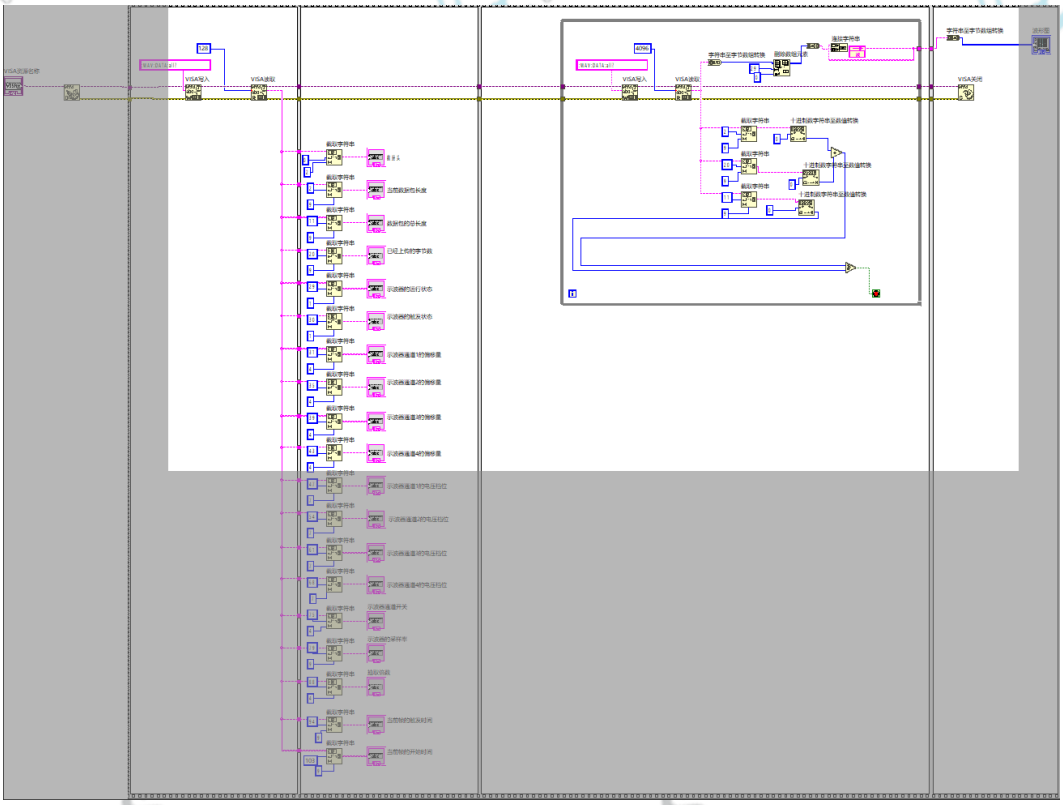
9. Add to read the waveform data, {Note: In order to prevent reading errors, it is recommended to read the full length}



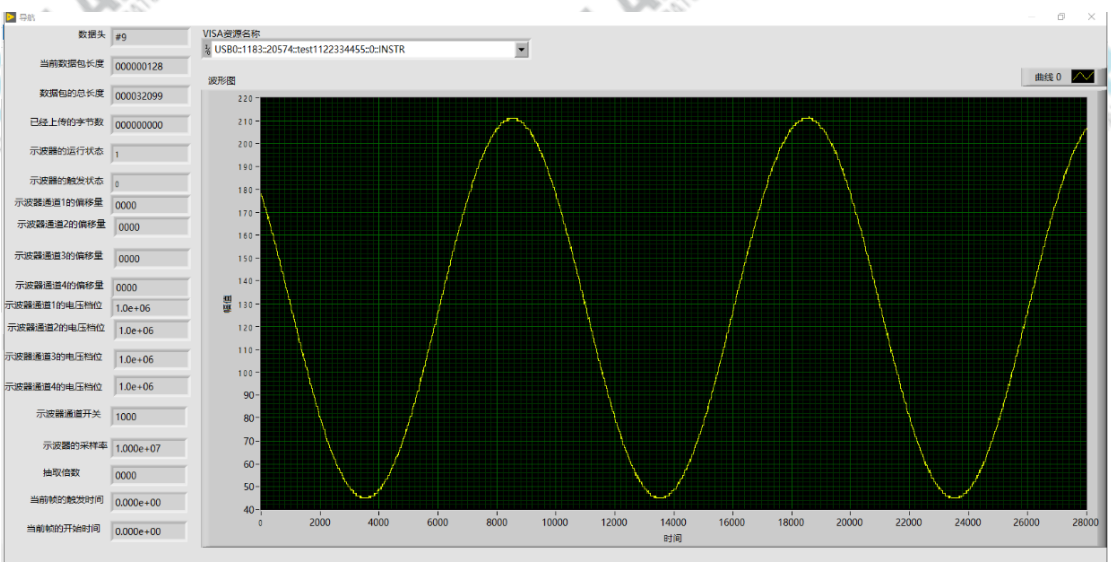
10. Add string conversion and waveform display module.



11. The complete block diagram is as follows:



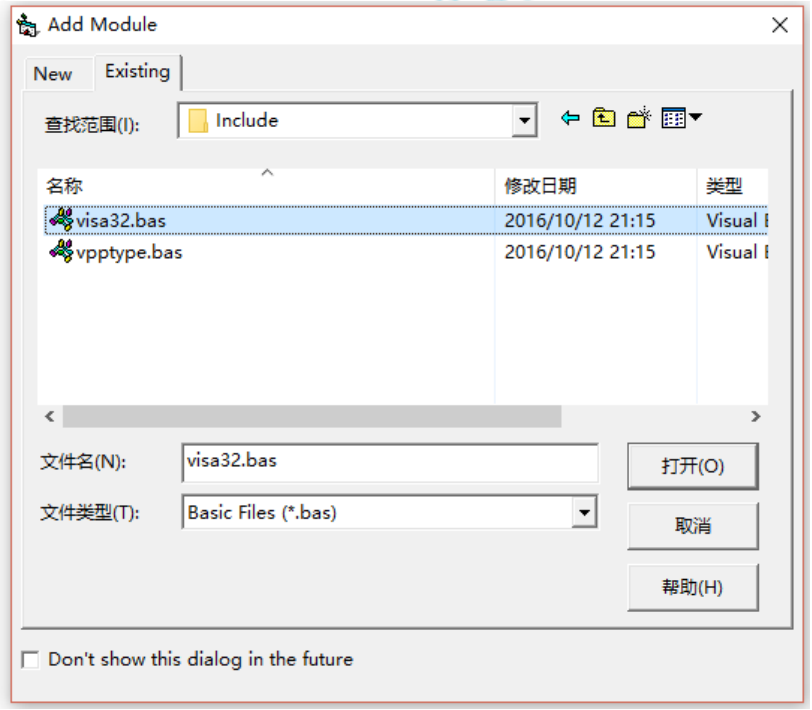
12. Select the device resource in the VISA resource name list box to start the operation.



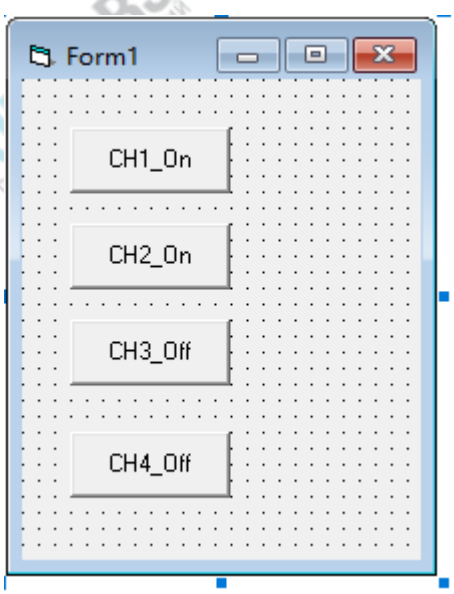
Visual Basic programming example

The program used in this example: Visual Basic 6.0 The function realized in this example: control the switch state of any channel. Enter the Visual Basic 6.0 programming environment and follow the steps below:

1. Create a standard application program project (Standard EXE) and name it MPO6000_Demo.
2. Open the Existing tab of ProjectAdd Module, find and add the visa32.bas file in the include folder under the NI-VISA installation path.



3. Add the following four buttons to the Demo, which represent the channel switches of CH1～CH4. As shown below:



4. Open the General tab in Project->Project1 Properties and select Form1 in the Startup Object drop-down box.

5. Double-click the CH1 button to enter the programming environment, and add the following code to realize the on-off control of CH1~CH4. The following is the code of CH1, other channel codes are similar.

```
Private Sub Command1_Click()

    Dim nDevices As Long          'Number of devices
    Dim Devices As String * 200 'Device connection string
```

```
    Dim bIsDisplay As Integer    'Whether the channel is open
    Dim DefRM As Long
    Dim vi As Long
    Dim strRes As String * 200
    Dim list As Long
  'Open Visa default RM
    Call viOpenDefaultRM(DefRM)
    Call viFindRsrc(DefRM, "USB?*", list, nDevices, Devices)
    'Turn on the device
    Call viOpen(DefRM, Devices, 0, 0, vi)
    'Send the query CH1 status command
    Call viVPrintf(vi, ":CHANnel1:DISPlay?" + Chr$(10), 0)
    'Get CH1 status
    Call viVScanf(vi, "%t", strRes)
    bIsDisplay = CInt(strRes)
    If (bIsDisplay = 1) Then
        'Send setting command
        Call viVPrintf(vi, ":CHANnel1:DISPlay 0" + Chr$(10), 0)
    Else
        Call viVPrintf(vi, ":CHANnel1:DISPlay 1" + Chr$(10), 0)
    End If
  'Close resource
    Call viClose(vi)
    Call viClose(DefRM)
End Sub
```

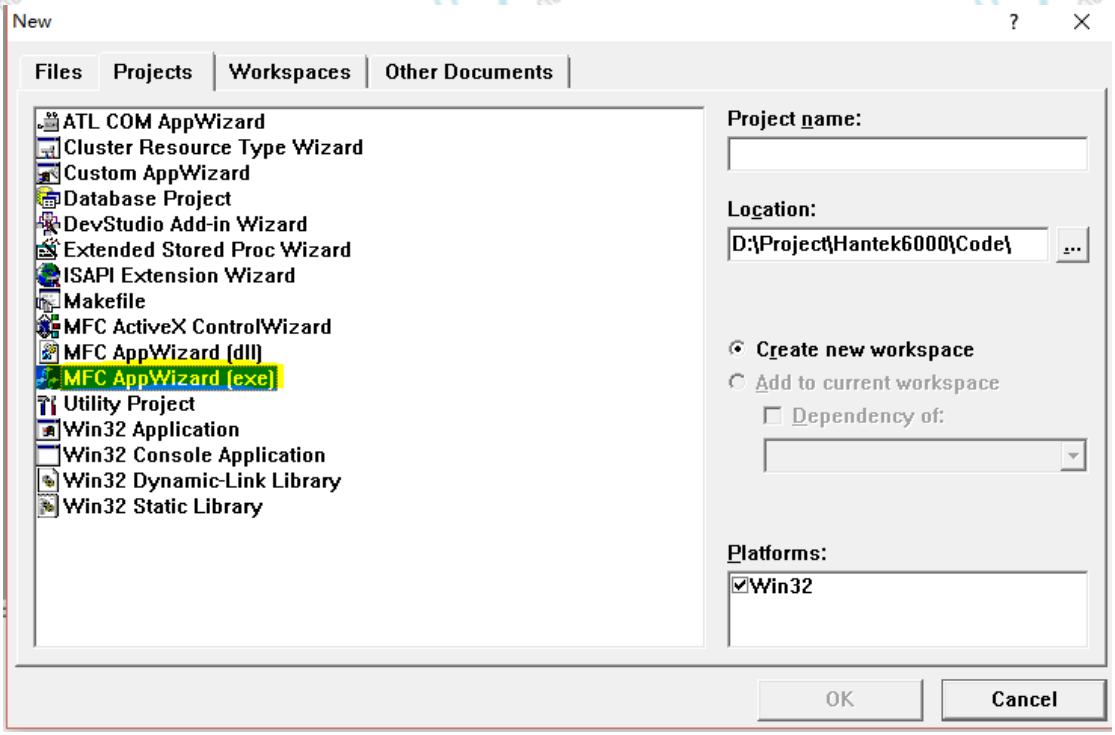
6. Save and run the entire project to get a single executable program of MPO6000_Demo. When the oscilloscope is successfully connected to the PC, it can realize on/off control of any channel.

Visual C++ programming examples

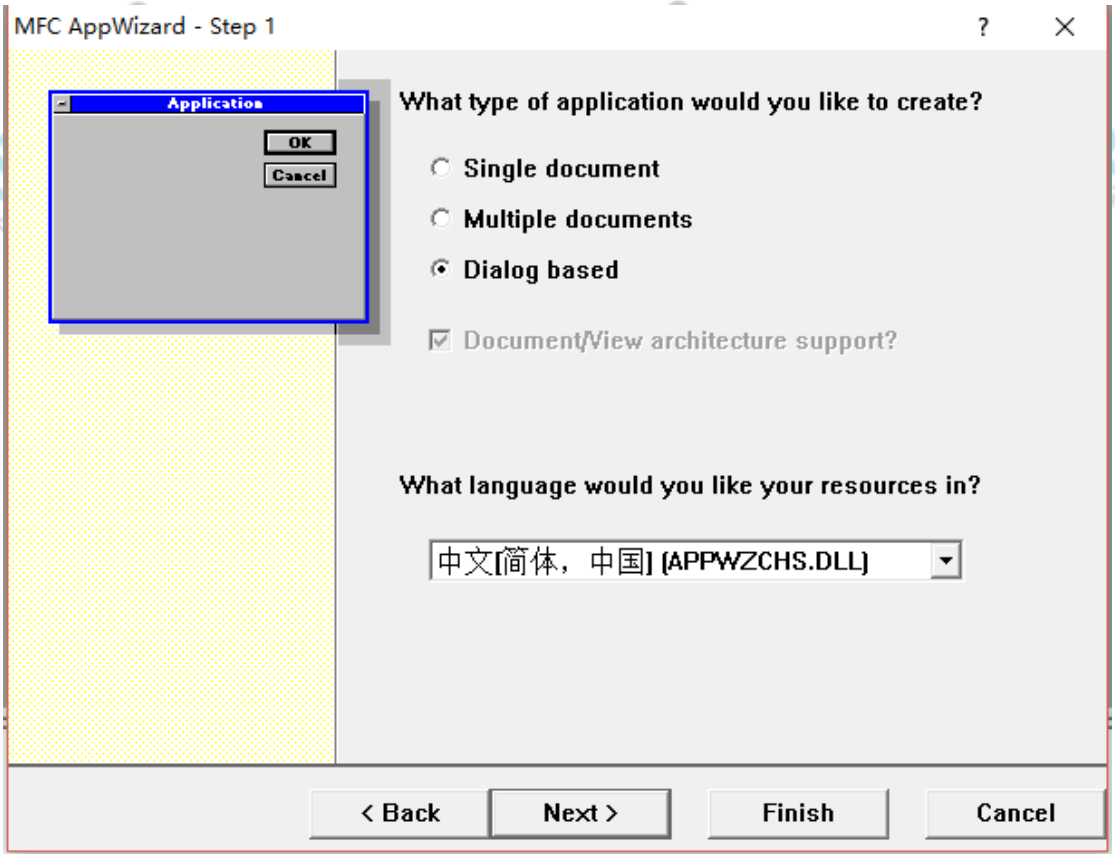
The program used in this example: Visual C++6.0

The functions implemented in this example: find the instrument address, connect to the instrument, send commands and read the return value. Enter the Visual C++6.0 programming environment and follow the steps below:

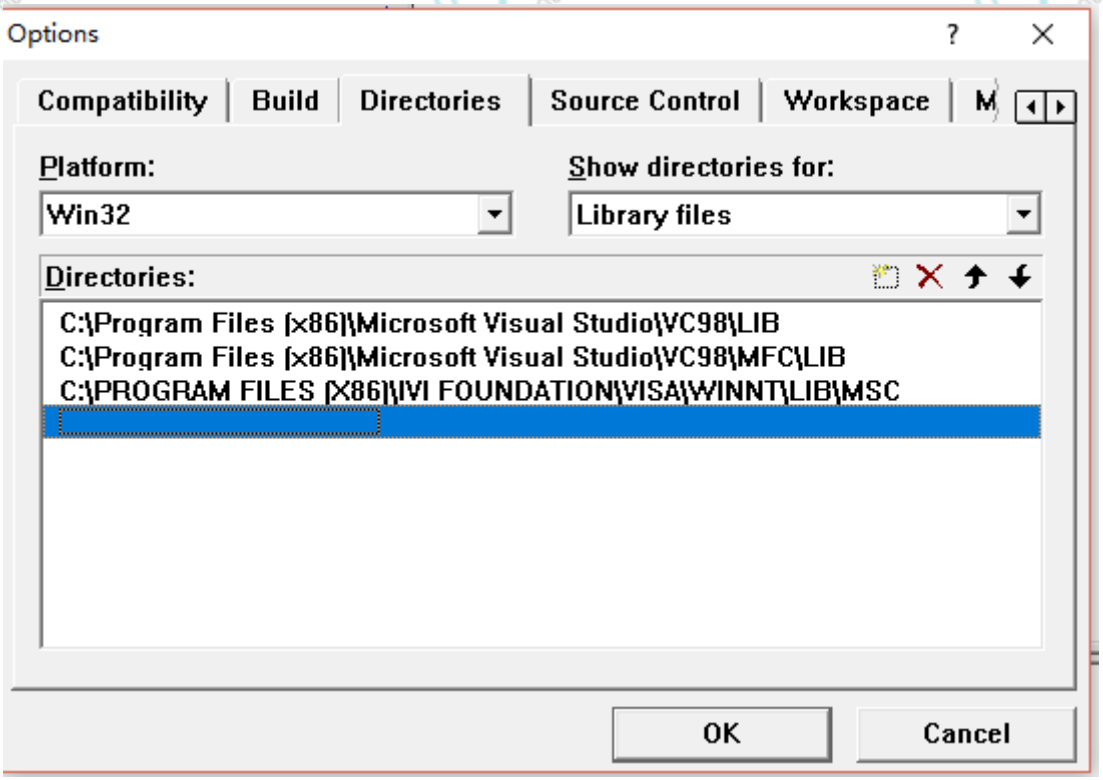
1. Create a dialog-based MFC project.



2. Select the project type as "Dialog based".

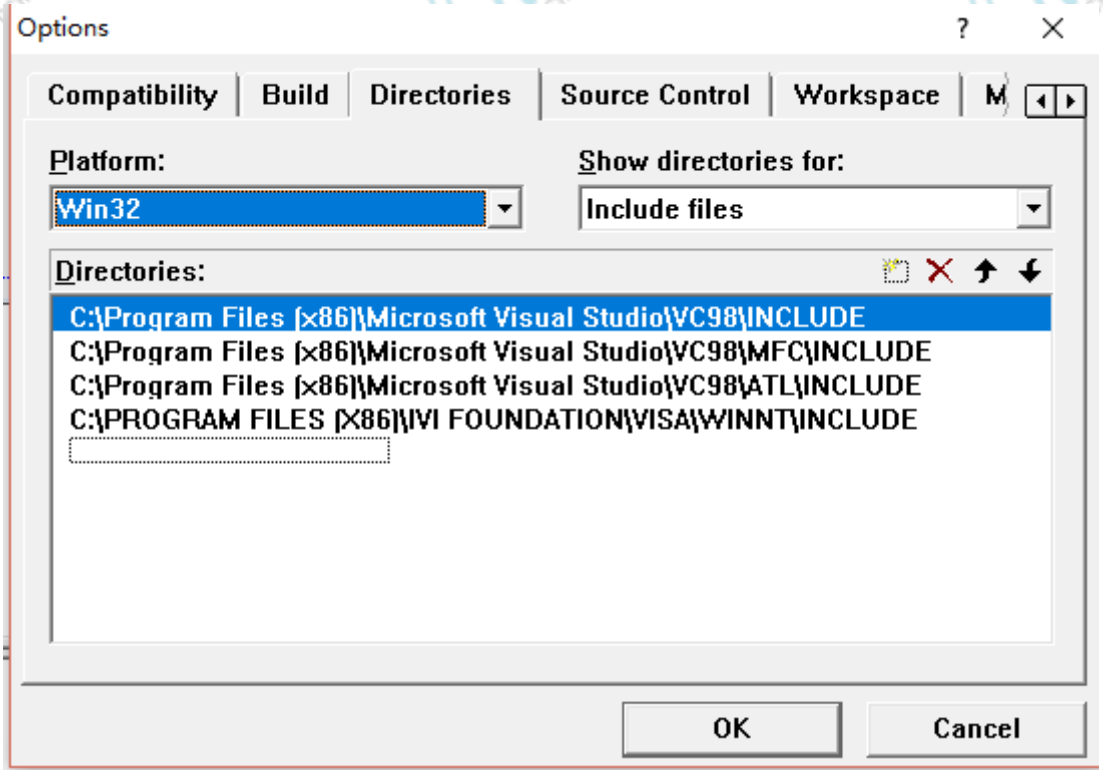


3. Open the Link tab in Project->Settings, and manually add visa32.lib in Object/library modules.



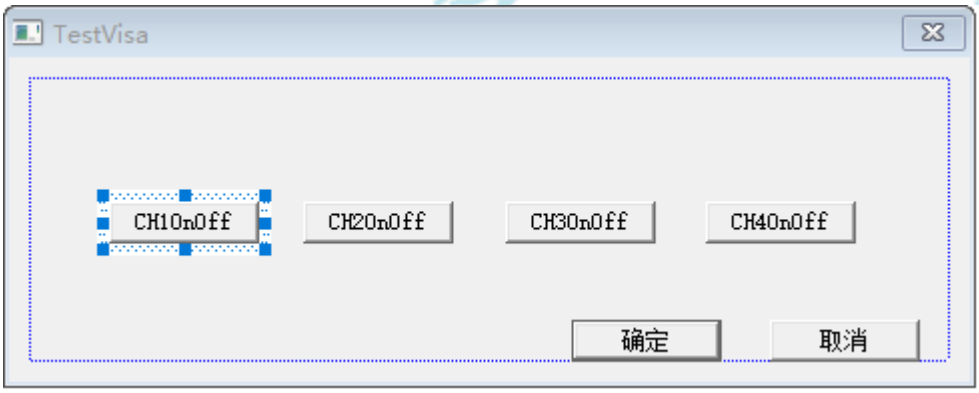
4. Open the Directories tab in Tools->Options.

Select Include files in Show directories for, double-click the blank space in the Directories box to add the path of Include: C:\Program Files(X86)\IVI Foundation\VISA\WinNT\include. Select Library files in Show directories for, double-click the blank space in the Directories box to add the path of Lib: C:\Program Files(X86)\IVI Foundation\VISA\WinNT\lib\msc.



Note: At this point, the VISA library has been added.

5. Add 4 Button controls. The layout is as follows:



6. Double-click the "CH1OnOff" button and add the following code to its click event handling code.

```
{
    // TODO: Add your control notification handler code here
    ViSession defaultRM, vi;
    char buf[256] = { 0 };
    ViChar buffer[VI_FIND_BUFLEN];
    ViRsrc Device = buffer;
    ViUInt32 nDevice;
    ViFindList list;
    viOpenDefaultRM(&defaultRM);

    //Get the USB resource of visa
    viFindRsrc(defaultRM, "USB?*", &list, &nDevice, Device);
    viOpen(defaultRM, Device, VI_NULL, VI_NULL, &vi);
    //Send inquiry CH1 status command
    viPrintf(vi, ":CHANnel1:DISPlay?\n");
    viScanf(vi, "%t\n", &buf);
    // Send setting command
    if (buf[0] == '1')
    {
        viPrintf(vi, ":CHANnel1:DISPlay 0\n");
    }
    else
    {
        viPrintf(vi, ":CHANnel1:DISPlay 1\n");
    }
    viClose(vi);
    viClose(defaultRM);

}
```

7. Save, compile and run the project to get a single executable file. When the oscilloscope is successfully connected to the PC, click "CH1OnOff" to control the on-off state of channel 1.

TestVisa
CH1OnOff
CH2OnOff
CH3OnOff
CH4OnOff
确定
取消