

Digital Storage Oscilloscope

GDS-2000A Series

PROGRAMMING MANUAL

GW INSTEK PART NO. Version 1.0, October 2012



ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

October 2012

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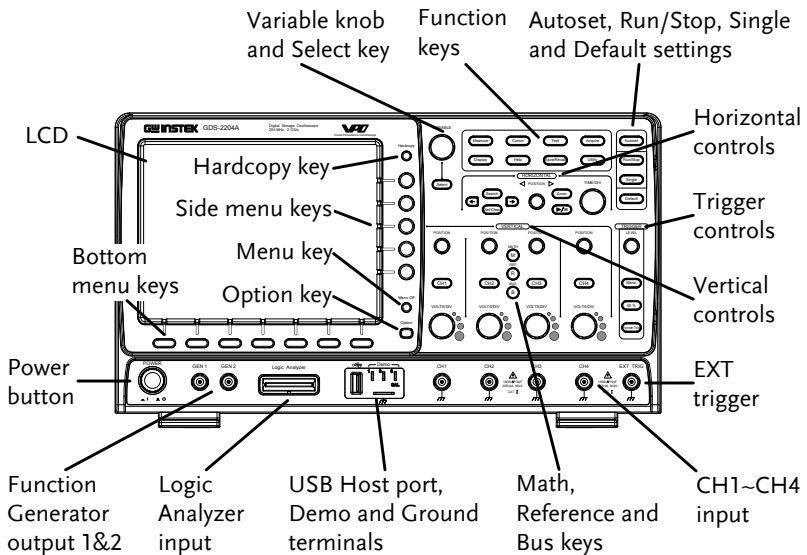
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INTERFACE OVERVIEW

This manual describes how to use the GDS-2000A's remote command functionality and lists the command details. The Overview chapter describes how to configure the GDS-2000A USB remote control interface, Ethernet interface, GPIB interface and RS-232 interface.

Front Panel Overview



4 channel model shown.

Interface Configuration

Configure USB Interface

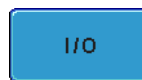
USB Configuration	PC side connector	Type A, host
	GDS-2000A side connector	Type B, device
	Speed	1.1/2.0 (high speed)
	USB Class	CDC (communications device class)

Panel Operation

1. Press the Utility key.



2. Press *I/O* from the bottom menu.



3. Press *USB Device Port* from the side menu and select *Computer*.




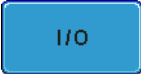


4. Connect the USB cable to the rear panel device port.





5. When the PC asks for the USB driver, select the USB driver included on the accompanying User Manual CD or download the driver from the GW Instek website, www.gwinstek.com, in the GDS-2000A product corner. The driver automatically sets the GDS-2000A as a serial COM port.

Configure RS-232C Interface

RS-232C Configuration	Connector	DB-9, Male
	Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200
	Parity	None, Odd, Even
	Data bit	8 (fixed)
	Stop bit	1, 2

- Panel Operation
1. Press the *Utility* key.
 
 2. Press *I/O* from the bottom menu.
 
 3. Press *RS-232C* from the side menu.
 
 4. Use the side menu to set the *Baud Rate*.
 

Baud Rate 2400, 4800, 9600, 19200, 38400, 57600, 115200
 5. Press *Stop Bit* to toggle the number of stop bits.
 

Stop Bits 1, 2
 6. Press *Parity* to toggle the parity.
 

Parity Odd, Even, None

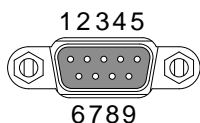
7. Press *Save Now* to save the settings.



8. Connect the RS-232C cable to the rear panel port: DB-9 male connector. For a functionality check, see page 13.



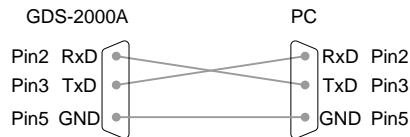
Pin Assignment



- 2: RxD (Receive data)
- 3: TxD (Transmit data)
- 5: GND
- 4, 6 ~ 9: No connection

PC Connection

Use a Null Modem connection as shown in the diagram below.



Configure the Ethernet Interface





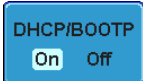
Ethernet Configuration

- MAC Address
- Instrument Name
- User Password
- Instrument IP Address
- Domain Name
- DNS IP Address
- Gateway IP Address
- Subnet Mask
- HTTP Port 80 (fixed)



The Ethernet option, DS2-LAN, must first be installed before proceeding. Please the user manual for further details.

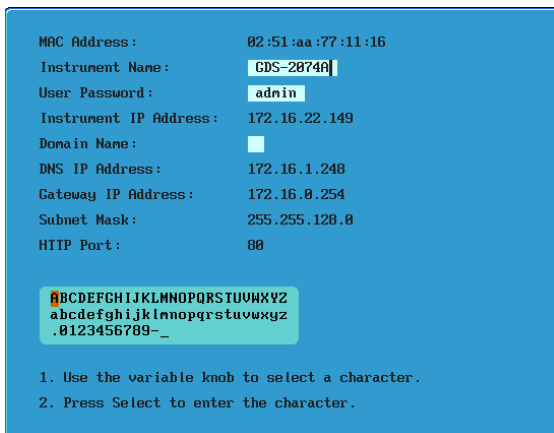
Background The Ethernet interface is used for remote configuration of the oscilloscope over a network using the integrated web server or for remote control using a socket server connection. For details, please see the Web Server Configuration section in the user manual or the Socket Server section on page 11.

- | | | |
|------------------------|---|---|
| Panel Operation | <ol style="list-style-type: none"> 1. Connect the Ethernet cable to the LAN port on the DS2-LAN module. |  |
| | <ol style="list-style-type: none"> 2. Press the <i>Utility</i> key. |  |
| | <ol style="list-style-type: none"> 3. Press <i>I/O</i> from the bottom menu. |  |
| | <ol style="list-style-type: none"> 4. Press <i>Ethernet</i> from the side menu. |  |
| | <ol style="list-style-type: none"> 5. Set <i>DHCP/BOOTP</i> to <i>On</i> or <i>Off</i> from the side menu. |  |

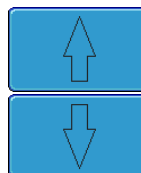


Note

IP addresses will automatically be assigned with DHCP/BOOTP set to on. For Static IP Addresses, DHCP/BOOTP should be set to off.



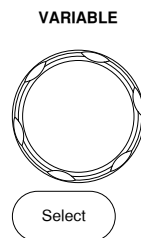
6. Use the *Up* and *Down* arrows on the side menu to navigate to each Ethernet configuration item.



Items MAC Address, Instrument Name, User Password, Instrument IP Address, Domain Name, DNS IP Address, Gateway IP Address, Subnet Mask

Note: HTTP Port is fixed at 80.

7. Use the *Variable* knob to highlight a character and use the *Select* key to choose a character.



Press *Backspace* to delete a character.



Configure Socket Server

The GDS-2000A supports socket server functionality for direct two-way communication with a client PC or device over LAN. By default, the Sockets Server is off.

Configure Socket Server 1. Configure the IP address for the GDS-2000A. Page 7

2. Press the *Utility* key.



3. Press *I/O* from the bottom menu.



4. Press *Socket Server* from the side menu.



5. Press *Select Port* and choose the port number with the Variable knob.



Range 1024~65535

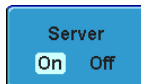
6. Press *Set Port* to confirm the port number.



7. The Current Port icon will update to the new port number.



8. Press *Server* and turn the socket server On.



Configure GPIB



Note

To use GPIB, the optional module, DS2-GPIB, must be installed. Please see the user manual for installation details.

Connection

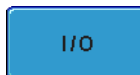
1. Connect a GPIB cable from a PC to the installed GPIB module.

Configure GPIB

2. Press the *Utility* key.



3. Press *I/O* from the bottom menu.



4. Use the Variable knob to set the GPIB Address from the side menu. This option will only be available when the GPIB module is installed.



Range 1 ~ 30

GPIB Constraints

- Maximum 15 devices altogether, 20m cable length, 2m between each device
- Unique address assigned to each device
- At least 2/3 of the devices turned On
- No loop or parallel connection

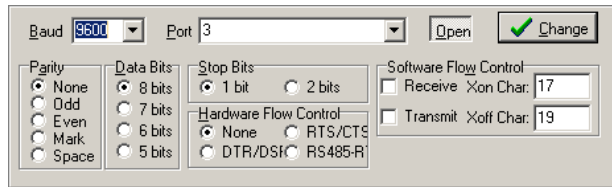
USB/RS-232C Functionality Check

Terminal Application (USB/RS-232C) Invoke a terminal application such as RealTerm. For RS-232C and USB, set the COM port, baud rate, stop bit, data bit, and parity accordingly.

To check the COM port number and associated port settings, see the Device Manager in the PC. For WinXP:

Control panel → System → Hardware tab

Example: Configuring RealTerm for RS232C communication.



Functionality Check Key in this query command via the terminal application.

`*idn?`

This should return the Manufacturer, Model number, Serial number, and Firmware version in the following format.

GW, GDS-2074A, PXXXXXX, V1.00

Socket Server Functionality Check

NI Measurement and Automation Explorer To test the socket server functionality, National Instruments Measurement and Automation Explorer can be used. This program is available on the NI website, www.ni.com.

Operation

1. Start the NI Measurement and Automation Explorer (MAX) program. Using Windows, press:



Start>All Programs>National Instruments>Measurement & Automation

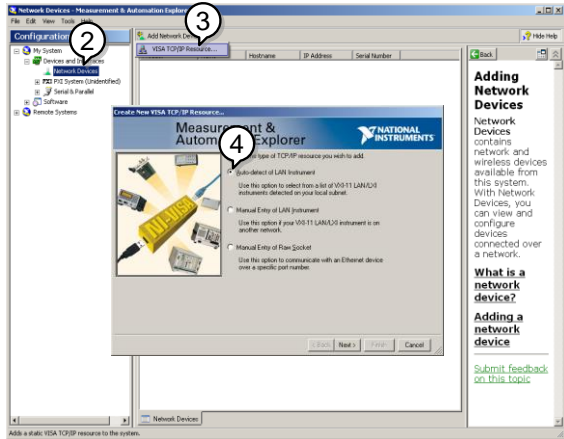


2. From the Configuration panel access;

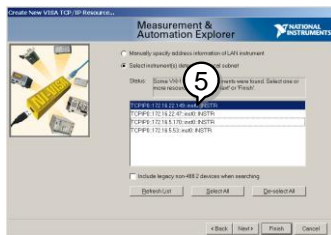
My System>Devices and Interfaces>Network Devices

3. Press *Add New Network Device>Visa TCP/IP Resource...*

4. Select *Auto-detect of LAN Instrument* from the popup window. The GDS-2000A should be automatically detected. If the GDS-2000A is not detected, choose the manual option.



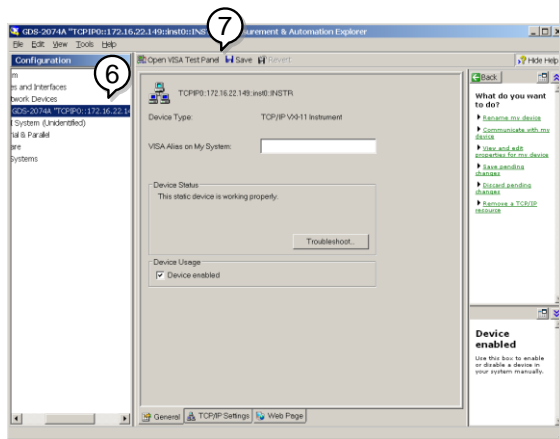
5. Select the IP address that corresponds to the GDS-2000A and click *Next*.



- The GDS-2000A will now appear under Network Devices in the Configuration Panel.

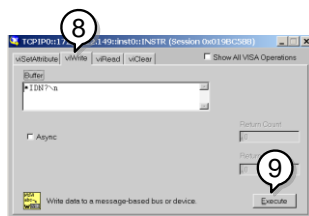
Functionality Check

- Click the *Open Visa Test Panel* to send a remote command to the GDS-2000A.

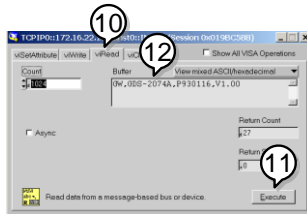


- Click on the *viWrite* tab. The **IDN?* query should already be in the buffer area.

- Click *Execute* to execute the query.



10. Click the *viRead* tab.
11. Click *Execute* to read the return parameter from the *IDN? query.
12. The manufacturer, model number, serial number and firmware version will be displayed in the buffer. For example:
GW, GDS-2074A, P930116, V1.00



GPIO Functionality Check

To check that the GPIO connection is working, National Instruments Measurement & Automation Explorer (MAX) can be used. The following function check is based on version 4.6.2.

For further information about National Instruments, please see the NI website at www.ni.com.

Operation

1. Start the NI Measurement and Automation Explorer (MAX) program. Using Windows, press:

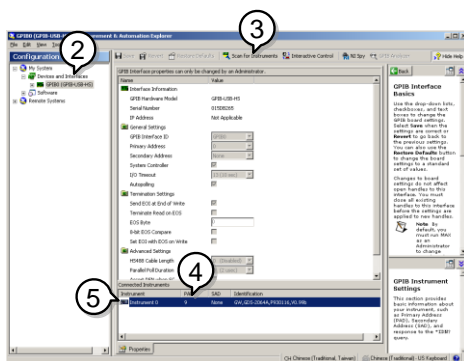


Start>All Programs>National Instruments>Measurement & Automation



2. From the Configuration panel access;
My System>Devices and Interfaces>GPIO

3. Press the *Scan for Instruments* button.
4. In the *Connected Instruments* panel the GDS-2000A should be detected as *Instrument 0* with the address the same as that configured on the GDS-2000A.
5. Double click the *Instrument 0* icon.



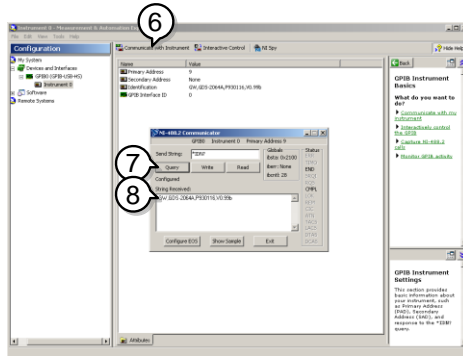
6. Click on *Communicate with Instrument*.
7. In the *NI-488.2 Communicator* window, ensure **IND?* is written in the *Send String:* text box.

Click on the *Query* button to send the **IDN?* query to the instrument.

8. The *String Received* text box will display the query return:

GW, GDS-2XXXX, PXXXXXX, V1.XX

(manufacturer, model, serial number, version)



9. The function check is complete.

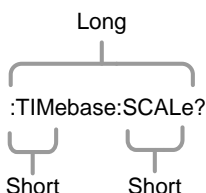
C COMMAND OVERVIEW

The Command overview chapter lists all GDS-2000A commands in functional order as well as alphabetical order. The command syntax section shows you the basic syntax rules you have to apply when using commands.

Command Syntax

- | | |
|---------------------|---|
| Compatible standard | <ul style="list-style-type: none"> • USB CDC_ACM compatible • SCPI, 1994 (partially compatible) |
|---------------------|---|
-

Command forms Commands and queries have two different forms, long and short. The command syntax is written with the short form of the command in capitals and the remainder (long form) in lower case.



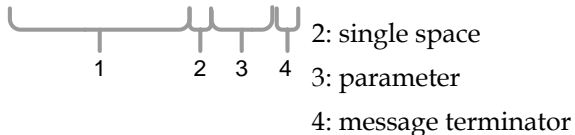
The commands can be written in capitals or lower-case, just so long as the short or long forms are complete. An incomplete command will not be recognized.

Below are examples of correctly written commands.

```
LONG :TIMebase:SCALe? :TIMEBASE:SCALE?
      :timebase:scale?
```

```
SHORT :TIM:SCAL? :TIM:SCAL?
```

Command format :TIMEbase:SCALE <NR3>LF 1: command header



Parameter	Type	Description	Example
	<Boolean>	boolean logic	0, 1
	<NR1>	Integers	0, 1, 2, 3
	<NR2>	floating point	0.1, 3.14, 8.5
	<NR3>	floating point with an exponent	4.5e-1, 8.25e+1
	<NRf>	any of NR1, 2, 3	1, 1.5, 4.5e-1

Message terminator LF line feed code

Note Commands are non-case sensitive.

List of Commands in Functional Order

Common	*IDN?	35
	*LRN?	35
	*SAV	37
	*RCL	38
	*RST	38
	*CLS	38
<hr/>		
Acquisition	:ACQuire:AVERAge	39
	:ACQuire:MODE	39
	:ACQuire<X>:MEMory?	40
	:ACQuire<X>:LMEMory?	41
	:ACQuire<X>:STATe?	41
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:HEADer	43	
<hr/>		
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C COMMAND DETAILS

The Command details chapter shows the detailed syntax, equivalent panel operation, and example for each command. For the list of all commands, see page23.

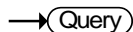
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Common Commands

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*IDN?

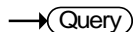


Description Returns the manufacturer, model, serial number and version number of the unit.

Syntax *IDN?

Example *IDN?
GW,GDS-2064A,P930116,V0.82b

*LRN?



Description Returns the oscilloscope settings as a data string.

Syntax *LRN?

Example *LRN?
:DISPlay:WAVEform VECTOR;PERSistence 2.400E-01;INTensity:WAVEform 50;INTensity:GRATICule 50;GRATICule FULL;CHANnel CH1:DISPlay ON;BWLimit FULL;COUpling DC;INVert OFF;POSition -8.800E-02;PROBe:RATio 1.000e+00;PROBe:TYPe VOLTAGE;SCALe 5.000E-02;IMPedance 1E+6;EXPand GROUND;:CHANnel CH2:DISPlay OFF;BWLimit FULL;COUpling DC;INVert OFF;POSition 3.120E-03;PROBe:RATio 1.000e+00;PROBe:TYPe VOLTAGE;SCALe 2.000E-03;IMPedance 1E+6;EXPand GROUND;:MATH:TYPe DUAL;DISP OFF;DUAL:SOURce1 CH1;SOURce2 CH2;OPERator PLUS;POSition 0.000E+00;SCALe 2.000E-03;FFT:SOURce CH1;MAG DB;WINDow HANNING;POSition 0.000E+00;SCALe ?;MATH:ADVanced:OPERator DIFF;ADVanced:SOURce CH1;ADVanced:EDIT:SOURce1

```

CH1;ADVanced:EDIT:SOURce2 CH2;ADVanced:EDIT:OPERator
PLUS;ADVanced:POSition
0.000E+00;ADVanced:SCALE ?;:MEASure:GATing SCREEN;SOURce1
CH1;SOURce2 CH2;:TIMebase:MODE MAIN;SCALE 2.000E-
04;POSITION 0.000E+00;WINDow:SCALE 1.000E-05;:ACQUIRE:MODE
SAMPE;AVERAge 4;:CURSor:SOURce
CH1;MODE ;H1Position ;H2Position ;V1Position ;V2Position ----
---- ---- ;:HARDcopy:MODE SAVE;PRINTINKSaver
ON;SAVEINKSaver OFF;SAVEFORMat BMP;ASSIGN
IMAGE;:TRIGger:FREQuency 1.000E+03;TYPe EDGE;SOURce
CH1;COUPle DC;NREJ OFF;REject OFF;MODE AUTO;HOLDoff
1.000E-08;LEVelH 8.800E-02;LEVeL ?;EDGE:SLOP RISE;DElay:TYPe
TIME;DElay:TIME 0.000;DElay:EVENT 1;DElay:LEVeL ?;DElay:SLOP
RISE;PULSEwidth:POLarity POSITIVE;RUNT:POLarity
POSITIVE;RUNT:WHEn THAN;RUNT:TIME 0.000;RISEFall:SLOP
RISE;RISEFall:WHEn THAN;RISEFall:TIME 0.000;VIDeo:TYPe
NTSC;VIDeo:FIELD FIELD1;VIDeo:LINE 1;VIDeo:POLarity
NEGATIVE;PULSE:WHEn THAN;PULSE:TIME 0.000;ALternate
OFF;EXTERnal:PRObe:TYPe VOLTAGE;EXTERnal:PRObe:RATio
1.000e+00;:TRIGGER:LOGIC:INPut:CLOCK:EDGE RISE;SOURce
NONE;:TRIGGER:LOGIC:PATTERN:INPut::TRIGGER:LOGIC:PATT
ERM:WHEN TRUE;:TRIGGER:LOGIC:PATTERN:DELTATIME 1.000e-
08;:TRIGger:BUS:TYPe PARALLEL;:TRIGger:BUS:B1:PARallel:VALue
XXXXXXXX;:B1:I2C:ADDRes:VALue XXXXXXXX;:CONDition
MISSACK;:ADDRes:DIRection WRITE;:DATA:SIZE 1;:DATA:VALue
XXXXXXXX;:UART:CONDition TXDATA;:RX:DATA:SIZE
1;:RX:DATA:VALue XXXXXXXX;:TX:DATA:SIZE 1;:TX:DATA:VALue
XXXXXXXX;:SPI:CONDition SS;:DATA:SIZE 1;:DATA:MISO:VALue
XXXX;:DATA:MOSI:VALue XXXX;:REF1:DISPlay
OFF;TIMebase:POSITION 0.000E+00;SCALE 2.000E-04;OFFSet
0.000E+00;SCALE 5.000E-01;:REF2:DISPlay OFF;TIMebase:POSition
0.000E+00;SCALE 2.000E-04;OFFSet 0.000E+00;SCALE 5.000E-
01;:REF3:DISPlay OFF;TIMebase:POSition 0.000E+00;SCALE
2.000E-04;OFFSet 0.000E+00;SCALE 5.000E-01;:REF4:DISPlay
OFF;TIMebase:POSITION 0.000E+00;SCALE 2.000E-04;OFFSet
0.000E+00;SCALE 5.000E-01;:DISPlay:DIGital:HEIght
SMALL;:BUS1:TYPe PARALLEL;:BUS1:DISPlay:FORMAt
HEXADECIMAL;:BUS1:PARallel:WIDth 8;:BIT0:SOURce
D0;:BIT1:SOURce D1;:BIT2:SOURce D2;:BIT3:SOURce
D3;:BIT4:SOURce D4;:BIT5:SOURce D5;:BIT6:SOURce
D6;:BIT7:SOURce D7;:CLOCK:EDGE RISE;:CLOCK:SOURce
D0;:BUS1:STATE OFF;:I2C:ADDRes:RWINClude
ON;:I2C:ADDRes:MODE 7BIT;:I2C:SCLK:SOURCE
D0;:I2C:SDA:SOURCE D1;:UART:BITRate 14;:UART:PARity
0;:UART:PACKet 0;:UART:EOPPacket 0;:UART:TX:SOURCE
D0;:UART:RX:SOURCE D1;:SPI:SCLK:POLARity
RISE;:SPI:SS:POLARity LOW;:SPI:WORDSize 4;:SPI:BITOrder
0;:SPI:SCLK:SOURCE D0;:SPI:SS:SOURCE D1;:SPI:MOSI:SOURCE
D2;:SPI:MISO:SOURCE D3;:SEARCH:STATE OFF;:TOTAL
0;:TRIGger:TYPe EDGE;:TRIGger:SOURce
CH1;:TRIGger:EDGE:SLOP RISE;:TRIGger:LEVeL

```

0.00V;;TRIGger:HLEVel 0.00V;;TRIGger:LLEVel
 0.00V;;TRIGger:PULSEWidth:POLarity
 POSITIVE;;TRIGger:RUNT:POLarity
 POSITIVE;;TRIGger:RISEFall:SLOP RISE;;TRIGger:PULSE:WHEN
 THAN;;TRIGger:PULSE:TIME 8.000e-08;;TRIGger:RUNT:WHEN
 THAN;;TRIGger:RUNT:TIME 8.000e-08;;TRIGger:RISEFall:WHEN
 THAN;;TRIGger:RISEFall:TIME 8.000e-
 08;;SEARCH:TRIGGER:LOGIC:INPut:CLOCK:EDGE RISE;SOURce
 NONE;;SEARCH:TRIGGER:LOGIC:PATTERN:INPUT::SEARCH:TRIG
 GER:LOGIC:PATTERN:WHEN
 TRUE;;TRIGGER:LOGIC:PATTERN:DELTATIME 1.000e-
 08;;TRIGger:BUS:TYPe PARALLEL;;TRIGger:BUS:B1:PARAllel:VALue
 XXXXXXXX;;B1:I2C:ADDRes:VALue XXXXXXXX;;CONDition
 START;ADDRes:DIRectioN WRITE;;DATa:SIze 1;;DATa:VALue
 XXXXXXXX;;UART:CONDition TXSTART;;RX:DATa:SIze
 1;;RX:DATa:VALue XXXXXXXX;;TX:DATa:SIze 1;;TX:DATa:VALue
 XXXXXXXX;;SPI:CONDition SS;DATa:SIze 1;;DATa:MISO:VALue
 XXXX;;DATa:MOSI:VALue
 XXXX;;CHANnel1:LABel ;;CHANnel2:LABel ;;CHANnel3:LABel ;;CH
 ANnel4:LABel ;;REF1:LABel ;;REF2:LABel ;;REF3:LABel ;;REF4:LABel
 ;;SET1:LABel ;;SET2:LABel ;;SET3:LABel ;;SET4:LABel ;;SET5:LABel ;;
 SET6:LABel ;;SET7:LABel ;;SET8:LABel ;;SET9:LABel ;;SET10:LABel ;;
 SET11:LABel ;;SET12:LABel ;;SET13:LABel ;;SET14:LABel ;;SET15:LA
 Bel ;;SET16:LABel ;;SET17:LABel ;;SET18:LABel ;;SET19:LABel ;;SET2
 0:LABel ;;BUS1:LABel ;;D0:LABel ;;D1:LABel ;;D2:LABel ;;D3:LABel ;;
 D4:LABel ;;D5:LABel ;;D6:LABel ;;D7:LABel ;;D8:LABel ;;D9:LABel ;;
 D10:LABel ;;D11:LABel ;;D12:LABel ;;D13:LABel ;;D14:LABel ;;D15:L
 ABel ;;CHANnel1:LABel:DISPlay OFF;;CHANnel2:LABel:DISPlay
 OFF;;CHANnel3:LABel:DISPlay OFF;;CHANnel4:LABel:DISPlay
 OFF;;REF0:LABel:DISPlay OFF;;REF1:LABel:DISPlay
 OFF;;REF2:LABel:DISPlay OFF;;REF3:LABel:DISPlay
 OFF;;BUS1:LABel:DISPlay OFF;;D0:LABel:DISPlay
 OFF;;D1:LABel:DISPlay OFF;;D2:LABel:DISPlay
 OFF;;D3:LABel:DISPlay OFF;;D4:LABel:DISPlay
 OFF;;D5:LABel:DISPlay OFF;;D6:LABel:DISPlay
 OFF;;D7:LABel:DISPlay OFF;;D8:LABel:DISPlay
 OFF;;D9:LABel:DISPlay OFF;;D10:LABel:DISPlay
 OFF;;D11:LABel:DISPlay OFF;;D12:LABel:DISPlay
 OFF;;D13:LABel:DISPlay OFF;;D14:LABel:DISPlay
 OFF;;D15:LABel:DISPlay OFF;;BUZZER OFF

***SAV**



Description Saves the current panel settings to the selected memory number.

Syntax *SAV {1 | 2 | 3 | ... | 20}

Example *SAV 1
 Saves the current panel settings to Set 1..

***RCL** Set →

Description Recalls a set of panel settings.

Syntax *RCL {1 | 2 | 3 |... | 20}

Example *RCL 1
 Recalls the selected setup from Set 1.

***RST** Set →

Description Resets the GDS-2000A (recalls the default panel settings).

Syntax *RST

***CLS** Set →

Description Clears the error queue.

Syntax *CLS

Acquisition Commands

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:ACQuire:AVERage
 →
 →

Description Selects or returns the number of waveform acquisitions that are averaged in the average acquisition mode.

Syntax :ACQuire:AVERage {<NR1>| ?}

Related Commands :ACQuire:MODE

Parameter <NR1> 2, 4, 8, 16, 32, 64, 128, 256

Note Before using this command, select the average acquisition mode. See the example below.

Example :ACQuire:MODE AVERage
 :ACQuire:AVERage 2
 Selects the average acquisition mode, and sets the average number to 2.

:ACQuire:MODE
 →
 →

Description Selects or returns the acquisition mode.

Syntax :ACQuire:MODE {SAMPlE | PDEtECT | AVERage | ?}

Related Commands :ACQuire:AVERage

Parameter	SAMPle	Sample mode sampling
	PDEtect	Peak detect sampling
	AVERage	Average sampling mode

Example :ACQuire:MODE PDEtect
Sets the sampling mode to peak detection.

:ACQuire<X>:MEMory? → Query

Description Returns the data in acquisition memory for the selected channel as a header + raw data.

Syntax :ACQuire<X>:MEMory?

Related Commands ACQuire:RECOrdlength
:HEAdEr

Parameter <X> Channel number (1 to 4)

Example :ACQuire1:MEMory?
Format,2.0A;Memory
Length,5000;IntpDistance,0;Trigger
Address,2499;Trigger Level,9.400E-
02;Source,CH1;Vertical Units,V;Vertical Units
Div,0;Vertical Units Extend Div,13;Label,;Probe
Type,0;Probe,1.000e+00;Vertical Scale,5.000e-
02;Vertical Position,-9.400e-02;Horizontal
Units,S;Horizontal Scale,2.000E-04;Horizontal
Position,0.000E+00;Horizontal Mode,Main;SincET
Mode,Real Time;Sampling Period,4.000e-
07;Horizontal Old Scale,2.000E-04;Horizontal Old
Position,0.000E+00;Firmware,V0.99.03;Time,19-
Sep-12 10:04:48;Waveform Data; #510000 <Raw
Data> <LF>

:ACquire<X>:LMEMory? → Query

Description	Returns the data in acquisition memory for the selected channel as a header + raw data. This is the equivalent to the Detail LM format.
Syntax	:ACquire<X>:LMEMory?
Related Commands	:ACquire:RECOrdlength :HEADer
Parameter	<X> Channel number (1 to 4)
Example	:ACquire1:LMEMory? Format,2.0A,Memory Length,1000000,IntpDistance,0,Trigger Address,2499,Trigger Level,9.400E-02,Source,CH1,Vertical Units,V,Vertical Units Div,0,Vertical Units Extend Div,13,Label,;Probe Type,0,Probe,1.000E+00,Vertical Scale,5.000E-02,Vertical Position,-9.400E-02,Horizontal Units,S,Horizontal Scale,2.000E-04,Horizontal Position,0.000E+00,Horizontal Mode,Main,SincET Mode,Real Time,Sampling Period,2.000E-09,Horizontal Old Scale,2.000E-04,Horizontal Old Position,0.000E+00,Firmware,V0.99.03,Time,19-Sep-12 10:40:10,Waveform Data; #72000000 <Raw Data> <LF>

:ACquire<X>:STATe? → Query

Description	Returns the status of waveform data.
Syntax	:ACquire<X>:STATe?
Parameter	<X> Channel number (1 to 4)
Return parameter	0 Raw data is not ready 1 Raw data is ready

Example :ACquire1:STATE?

0

Returns 0. The channel 1's raw data is not ready.

Note: If the oscilloscope changes the acquisition status from STOP to RUN, the status will be reset as zero.

Set →

:ACquire:INTERpolation

→ Query

Description Selects or returns the interpolation mode.

Syntax :ACquire:INTERpolation {ET | SINC | ?}

Parameter/Return parameter	ET	Set the Equivalent Time interpolation.
	SINC	Sets to SIN(X)/X interpolation

Example :ACquire:INTERpolation ET

Sets the scope to ET interpolation.

Set →

:ACquire:FILTer

→ Query

Description Sets the normalized cut-off frequency to the nearest set. [0.02 : 0.02~0.98]

Syntax :ACquire:FILTer {OFF | <NR3> | ?}

Parameter/Return parameter	OFF	Turns the digital filter off.
	<NR3>	0.02,0.04~0.98.

Example :ACquire:FILTer OFF

Turns the digital filter off.

Set →

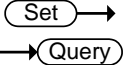
:ACquire:RECOrdlength

→ Query

Description Sets or queries the record length. Please see the user manual for full details.

Syntax :ACquire:RECOrdlength {AUTO | SHORT | ?}

Parameter/Return	AUTO	Auto record length.
------------------	------	---------------------

parameter	SHORT Short record length.
Example	:ACquire:RECOndlength? AUTO The record length is currently set to AUTO.
:HEADer	 <p>The diagram shows a rounded rectangle labeled "Set" with an arrow pointing to the right, and another rounded rectangle labeled "Query" with an arrow pointing to the left, indicating that the command can be used to set or query the configuration.</p>
Description	Configures whether the :ACquire:MEM or :ACquire:LMEM return data will contain header information or not. It is set to ON by default.
Syntax	:HEADer {OFF ON ?}
Related Commands	:ACquire<X>:MEMory? :ACquire<X>:LMEMory?
Parameter	<p><X> Channel number (1 to 4)</p> <p>ON Add header information.</p> <p>OFF Don't add header information.</p>
Return parameter	Returns the configuration (ON, OFF) for the selected channel.
Example	:HEADer ON

Autoscale Commands

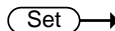
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:AUTOSet

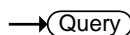


Description Runs the Autoset function to automatically configure the horizontal scale, vertical scale, and trigger according to the input signal.

Syntax :AUTOSet



:AUTORSET:MODE



Description Sets the Autoset mode or queries its state.

Syntax :AUTORSET:MODE {FITScreen | ACPriority | ?}

Related Commands :AUTOSet

Parameter/Return parameter	FITScreen	Fit Screen mode
	ACPriority	AC priority mode

Example :AUTORSET?
FITSCREEN

Vertical Commands

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:CHANnel<X>:IMPedance?.....	47
:CHANnel<X>:INVert	48
:CHANnel<X>:POSition	48
:CHANnel<X>:PROBe:RATio	49
:CHANnel<X>:PROBe:TYPe.....	49
:CHANnel<X>:SCALE	49

:CHANnel<X>:BWLimit




Description	Sets or returns the bandwidth limit on/off.	
Syntax	:CHANnel<X>:BWLimit {FULL <NR3> ?}	
Parameter	<X>	Channel 1,2,3,4
	FULL	Full bandwidth
	<NR3>	Sets the bandwidth limit to a pre-defined bandwidth.
		200E+6: 200MHz 100E+6: 100MHz 20E+6: 20MHz
Return Parameter	<NR3>	Returns the bandwidth.
	Full	Full bandwidth
Example	:CHANnel1:BWLimit 2.000E+07 Sets the channel 1 bandwidth 20MHz	

:CHANnel<X>:COUPling
 →
 →

Description	Selects or returns the coupling mode.	
Syntax	CHANnel<X>:COUPling {AC DC GND ?}	
Parameter	<X>	Channel 1,2,3,4
	AC	AC coupling
	DC	DC coupling
	GND	Ground coupling
Return parameter	Returns the coupling mode.	
Example	:CHANnel1:COUPling DC Sets the coupling to DC for Channel 1.	

:CHANnel<X>:DESKew
 →
 →

Description	Sets the deskew time in seconds.	
Syntax	:CHANnel<X>:DESKew { <NR3> ?}	
Parameter	<X>	Channel 1,2,3,4
	<NR3>	Deskew time: -5.00E-11 to 5.00E-11 -50ns to 50 ns.
Return parameter	<NR3>	Returns the deskew time.
Example	:CHANnel1:DESKew 1.300E-9 Sets the deskew time to 1.3 nano seconds.	

:CHANnel<X>:DISPlay
 →
 →

Description	Turns a channel on/off or returns its status.	
Syntax	:CHANnel<X>:DISPlay {OFF ON ?}	
Parameter	<X>	Channel 1,2,3,4
	OFF	Channel off
	ON	Channel on

Return Parameter	ON	Channel is on.
	OFF	Channel is off

Example :CHANnel1:DISPlay ON
Turns on Channel 1

:CHANnel<X>:EXPand (Set) →
→ (Query)

Description Sets Expand By Ground or Expand By Center for a channel or queries its status.

Syntax :CHANnel<X>:EXPand {GND | CENTER | ?}

Parameter	<X>	Channel 1,2,3,4
	GND	Ground
	CENTER	Center

Return parameter	GND	Expand By Ground
	CENTER	Expand By Center

Example :CHANnel1:EXPand GND
Sets Channel 1 to Expand By Ground.

:CHANnel<X>:IMPedance? → (Query)

Description Returns the impedance of the oscilloscope.

Syntax :CHANnel<X>:IMPedance?

Parameter	<x>	Channel
	1/2/3/4	CH1/2/3/4

Return parameter <NR3> Returns the impedance value.

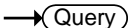
Example :CHANnel1:IMPedance?
1.000000E+06
The impedance is 1M ohms.

:CHANnel<X>:INVert



Description	Inverts a channel or returns its status.	
Syntax	:CHANnel<X>:INVert {OFF ON ?}	
Parameter	<X>	Channel 1, 2, 3, 4
	OFF	Invert off
	ON	Invert on
Return parameter	ON	Invert on
	OFF	Invert off
Example	:CHANnel1:INVert ON Inverts Channel 1	

:CHANnel<X>:POSition



Description	Sets or returns the position level for a channel.	
Note	The vertical position will only be set to closest allowed value. The position level range depends on the vertical scale.	
	The scale must first be set before the position can be set.	
Syntax	:CHANnel<X>:POSition { <NRf> ?}	
Parameter	<X>	Channel 1, 2, 3, 4
	<NRf>	Position. Range depends on the vertical scale.
Return parameter	<NR3>	Returns the position value.
Example 1	:CHANnel1:POSition 2.4E-3 Sets the Channel 1 position to 2.4mV/mA	
Example 2	:CHANnel1:POSition? 2.4E-3 Returns 2.4mV as the vertical position.	

Set →
 → Query

:CHANnel<X>:PROBE:RATio

Description	Sets or returns the probe attenuation factor.	
Syntax	:CHANnel<X>:PROBE:RATio { <NRf> ? }	
Related Commands	:CHANnel<X>:PROBE:TYPE	
Parameter	<X>	Channel 1, 2, 3, 4
	<NRf>	Probe attenuation factor.
Return parameter	<NR3>	Returns the probe factor.
Example	:CHANnel1:PROBE:RATio 1.00E+0 Sets the Channel 1 probe attenuation factor to 1x	

Set →
 → Query

:CHANnel<X>:PROBE:TYPE

Description	Sets or returns the probe type (voltage/current).	
Syntax	:CHANnel<X>:PROBE:TYPE { VOLTage CURRent ? }	
Related Commands	:CHANnel<X>:PROBE:RATio	
Parameter	<X>	Channel 1, 2, 3, 4
	VOLTage	Voltage
	CURRent	Current
Return parameter	Returns the probe type.	
Example	:CHANnel1:PROBE:TYPE VOLTage Sets the Channel 1 probe type to voltage.	

Set →
 → Query

:CHANnel<X>:SCALE

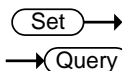
Description	<p>Sets or returns the vertical scale. The scale depends on the probe attenuation factor.</p> <p>Note the probe attenuation factor should be set before the scale.</p>
-------------	--

Syntax	:CHANnel<X>:SCALE { <NRf> ?}	
Parameter	<X>	Channel 1, 2, 3, 4
	<NRf>	Vertical scale: 2e-3 to 1e+1 2mV to 10V (Probe x1)
Return parameter	<NR3>	Returns the vertical scale in volts or amps.
Example	:CHANnel1:SCALE 2.00E-2	
	Sets the Channel 1 vertical scale to 20mV/div	

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:MATH:DISP



Description	Turns the math display on or off on the screen.	
Syntax	:MATH:DISP {OFF ON ?}	
Parameter/ Return parameter	OFF	Math is not displayed on screen
	ON	Math is displayed on screen
Example	:MATH:DISP OFF Math is off.	

Set →
 → Query

:MATH:TYPE

Description	Queries or sets the Math type to FFT, Advanced Math or to dual channel math operations	
Syntax	:MATH:TYPE { DUAL ADVanced FFT ? }	
Related Commands	:MATH:DISP	
Parameter	DUAL	Dual channel operations
	ADVanced	Advanced math operations
	FFT	FFT operations
Return parameter	Returns the math type.	
Example	:MATH:TYPE DUAL Sets the Math type to dual channel math operation.	

Set →
 → Query

:MATH:DUAL:SOURce<X>

Description	Sets the dual math source for source 1 or 2.	
Syntax	:MATH:DUAL:SOURce<X> { CH1 CH2 CH3 CH4 REF1 REF2 REF3 REF4 ? }	
Parameter	<X>	Source number 1 or 2
	CH1~4	Channel 1 to 4
	REF1~4	Reference waveforms 1 to 4
Return parameter	Returns the source for the source 1 or 2.	
Example	:MATH:DUAL:SOURce1 CH1 Sets source1 as channel 1.	

Set →
 → Query

:MATH:DUAL:OPERator

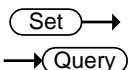
Description	Sets the math operator for dual math operations.	
-------------	--	--

Syntax :MATH:DUAL:OPERator {PLUS | MINUS | MUL | DIV|?}

Parameter	PLUS	+ operator
	MINUS	- operator
	MUL	× operator
	DIV	÷ operator

Return parameter Returns operator type.

Example :MATH:DUAL:OPERator PLUS
Sets the math operator as plus (+).



:MATH:DUAL:POSition

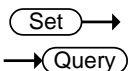
Description Sets the vertical position of the displayed math result expressed by division.

Syntax :MATH:DUAL:POSition {<NRf> | ? }

Parameter	<NRf>	Vertical position Depends on the vertical scale (Unit/Div)
-----------	-------	---

Return parameter <NR3> Returns the vertical position.

Example :MATH:DUAL:POSition 1.0E+0
Sets the vertical position to 1.00 unit/div.



:MATH:DUAL:SCALE

Description Sets the vertical scale of the displayed math result.

Syntax :MATH:DUAL:SCALE {<NRf> | ? }

Parameter	<NRf>	Vertical scale
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Return parameter <NR3> Returns the scale.

Example :MATH:DUAL:SCALE 2.0E-3
Sets the vertical scale to 2mV/2mA.

:MATH:FFT:SOURce (Set) →
→ (Query)

Description	Sets and queries the FFT math source.	
Syntax	:MATH:FFT:SOURce { CH1 CH2 CH3 CH4 REF1 REF2 REF3 REF4 FUNCtion ? }	
Related commands	:MATH:ADVanced:EDIT:SOURce<X> :MATH:ADVanced:EDIT:OPERator	
Parameter	CH1~4	Channel 1 to 4
	REF1~4	Reference waveform 1 to 4
	FUNCtion	F(X) waveform
Return parameter	Returns the FFT source.	
Example	:MATH:FFT:SOURce CH1 Sets the FFT math source as channel 1.	

:MATH:FFT:MAG (Set) →
→ (Query)

Description	Sets FFT vertical units as linear or decibels.	
Syntax	:MATH:FFT:MAG { LINEAR DB ? }	
Parameter	LINEAR	Linear units (Vrms)
	DB	Logarithmic units (dB)
Return parameter	Returns the FFT vertical units.	
Example	:MATH:FFT:MAG DB Sets FFT vertical units to dB.	

:MATH:FFT:WINDow (Set) →
→ (Query)

Description	Sets the windowing filter used for the FFT function.	
Syntax	:MATH:FFT:WINDow { RECTangular HAMming HANning BLAckman ? }	

Parameter	RECTangular	Rectangular window
	HAMming	Hamming window
	HANning	Hanning window
	BLAckman	Blackman window

Return parameter Returns the FFT window.

Example :MATH:FFT:WINDow HAMming
Sets the FFT window filter to hamming.

Set →

:MATH:FFT:POSition → Query

Description Sets the vertical position of the displayed FFT result.

Syntax MATH:FFT:POSition { <NRf> | ? }

Parameter	<NRf>	Vertical position: -12e+0 to +12e+0 (12 units/division to +12 units/division.)
-----------	-------	---

Return parameter	<NR3>	Returns the vertical position.
------------------	-------	--------------------------------

Example :MATH:FFT:POSition -2e-1
Sets the FFT position to -0.2 divisions.

Set →

:MATH:FFT:SCALE → Query

Description Sets the vertical scale of the displayed FFT result.

Syntax :MATH:FFT:SCALE {<NRf> | ?}

Parameter	<NRf>	Vertical scale: Linear: 2e-3 to 1e+ (32mV~1kV) dB: 1e+0 to 2e+1 (1~20dB)
-----------	-------	--

Return parameter	<NR3>	Returns vertical scale.
------------------	-------	-------------------------

Example :MATH:FFT:SCALE 1.0e+0
Sets the scale to 1dB.

:MATH:FFT:HORizontal:SCALE (Set) →
→ (Query)

Description	Sets or queries the zoom scale for FFT math.	
Syntax	:MATH:FFT:HORizontal:SCALE {<NRf> ?}	
Parameter	<NRf>	Zoom scale: 1 to 20 times
Return parameter	<NR3>	Returns zoom scale.
Example	:MATH:FFT:HORizontal:SCALE 5 Sets the zoom scale to 5X.	

:MATH:ADVanced:OPERator (Set) →
→ (Query)

Description	Sets or queries the advanced math operator.	
Syntax	:MATH:ADVanced:OPERator {DIFF INTG SQRT ?}	
Parameter	DIFF	d/dt
	INT	∫dt
	SQRT	√
Return parameter	Returns operator type.	
Example	:MATH:ADVanced:OPERator DIFF Sets the advanced math operator as d/dt.	

:MATH:ADVanced:SOURce (Set) →
→ (Query)

Description	Sets or queries the advanced math source.	
Syntax	:MATH:ADVanced:SOURce { CH1 CH2 CH3 CH4 REF1 REF2 REF3 REF4 FUNCTION ? }	
Related Commands	:MATH:ADVanced:EDIT:SOURce<X> :MATH:ADVanced:EDIT:OPERator	
Parameter	CH1~4	Channel 1 to 4
	REF1~4	Reference waveform 1 to 4
	FUNCTION	F(X) waveform

Return parameter Returns the advanced source.

Example :MATH:ADVanced:SOURce CH1
Sets the advanced math source as channel 1.

:MATH:ADVanced:EDIT:SOURce<X>  

Description Sets or queries the advanced math f(x) source.

Syntax :MATH:ADVanced:EDIT:SOURce { CH1 | CH2 | CH3 | CH4 | ? }

Related Commands :MATH:ADVanced:EDIT:OPERator

Parameter CH1~4 Channel 1 to 4

Return parameter Returns the source.

Example :MATH:ADVanced:EDIT:SOURce CH1
Sets the advanced math source as channel 1.

:MATH:ADVanced:EDIT:OPERator  

Description Sets or queries the math operator for the advanced math f(x) function.

Syntax :MATH:ADVanced:EDIT:OPERator { PLUS | MINUS | MUL | DIV | ? }

Parameter	PLUS	+ operator
	MINUS	- operator
	MUL	× operator
	DIV	÷ operator

Return parameter Returns operator type.

Example :MATH:ADVanced:EDIT:OPERator PLUS
Sets the math operator as plus (+).

:MATH:ADVanced:POSition

Set →

→ Query

Description	Sets the vertical position of the advanced math result, expressed in unit/div.	
Syntax	:MATH:ADVanced:POSition { <NRf> ? }	
Parameter	<NRf>	Vertical position: -12e+0 to +12e+0 (12 units/division to +12 units/division.)
Return parameter	<NR3>	Returns the vertical position.
Example	:MATH:ADVanced:POSition 1.0e+0 Sets the position as 1.00 unit/div.	

:MATH:ADVanced:SCALE

Set →

→ Query

Description	Sets or queries the vertical scale the advanced math result.	
Syntax	:MATH:ADVanced:SCALE {<NRf> ?}	
Parameter	<NRf>	Vertical scale
Return parameter	<NR3>	Returns the vertical scale.
Example	:MATH:ADVanced:SCALE 2.0E-3 Sets the vertical scale to 2mV/S	

Cursor Commands

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:CURSor:MODE

Set →

→ Query

Description Sets cursor mode to horizontal (H) or horizontal and vertical (HV).
 Note: When the cursor source is set to logic or bus, then only the horizontal cursor is available.

Syntax :CURSor:MODE {OFF | H | HV | ? }

Parameter	OFF	Turns the cursors off.
	H	Turns the horizontal cursors on.
	HV	Turns horizontal and vertical cursors on.

Return parameter Returns the state of the cursors (H, HV, OFF).

Example :CURSor:MODE OFF
 Turns the cursors off.

Set →

→ Query

:CURSor:SOURce

Description Sets or queries the cursor source.

Syntax :CURSor:SOURce {CH1 | CH2 | CH3 | CH4 | REF1 | REF2 | REF3 | REF4 | MATH | LOGic | BUS1 | ? }

Parameter	CH1~CH4	Channel 1 to 4
	REF1~4	Reference waveform 1 to 4
	MATH	Math source
	LOGic	Logic source
	BUS1	Bus source

Return parameter Returns the cursor source.

Example :CURSor:SOURce CH1
 Turns the cursor source as channel 1.

		Set →
		→ Query
:CURSor:HUNI		
Description	Sets or queries the units for the horizontal bar cursors.	
Syntax	:CURSor:HUNI {SEConds HERTz DEGrees PERcent ?}	
Related Commands	:CURSor:MODE	
Parameter	SEConds	Sets the cursor units to time in seconds.
	HERTz	Sets the cursor units to frequency.
	DEGrees	Sets the cursor units to degrees.
	PERcent	Sets the cursor units to percent.
Return parameter	Returns the unit type.	
Example	:CURSor:HUNI SEConds Sets the units to time in seconds.	

		Set →
:CURSor:HUSE		
Description	Sets the current cursor position as the phase or ratio reference for the Percent or Degrees (horizontal) cursors.	
Note	This command can only be used when :CURSor:HUNI is set to DEGrees or PERcent.	
Syntax	:CURSor:HUSE {CURRent}	
Related Commands	:CURSor:MODE :CURSor:HUNI	
Parameter	CURRent	Uses the current horizontal position
Example	:CURSor:HUSE CURRent.	

:CURSor:VUNI

Set →

→ Query

Description	Sets or queries the units for the vertical bar cursors.	
Syntax	:CURSor:VUNI {BASE PERcent ?}	
Related Commands	:CURSor:MODE	
Parameter	BASE	Sets the vertical cursor units the same as the scope units (V or A).
	PERcent	Sets the displayed units to percent.
Return parameter	Returns the unit type.	
Example	:CURSor:VUNI BASE Sets the units to the base units.	

:CURSor:VUSE

Set →

Description	Sets the current cursor position as the ratio reference for the Percent (vertical) cursors.	
Note	This command can only be used when :CURSor:VUNI is set to PERcent.	
Syntax	:CURSor:VUSE {CURRent}	
Related Commands	:CURSor:MODE :CURSor:VUNI	
Parameter	CURRent	Uses the current vertical position
Example	:CURSor:VUSE CURRent.	

:CURSor:DDT

→ Query

Description	Returns the deltaY/deltaT (dy/dT) readout.	
Syntax	:CURSor:DDT {?}	
Related Commands	:CURSor:MODE	

Return Parameter **<NR3>** Returns the readout in <NR3> format.

Example :CURSor:DDT?
4.00E-05

:CURSor:H1Position

Set →

→ Query

Description Sets or returns the first horizontal cursor (H1) position.

Syntax :CURSor:H1Position {<NRf> | ?}

Related Commands :CURSor:H2Position

Parameter **<NRf>** Horizontal position

Return parameter Returns the cursor position.

Example :CURSor:H1Position?
-1.34E-3

Returns the H1 cursor position as -1.34ms.

:CURSor:H2Position

Set →

→ Query

Description Sets or returns the second horizontal cursor (H2) position.

Syntax :CURSor:H2Position {<NRf> | ?}

Related Commands :CURSor:H1Position

Parameter **<NRf>** Horizontal Position

Return parameter Returns the cursor position.

Example :CURSor:H2Position 1.5E-3

Sets the H2 cursor position to 1.5ms.

:CURSor:HDELta

→ Query

Description Returns the delta of H1 and H2.

Syntax	:CURSor:HDELta {?}	
Return Parameter	<NR3>	Returns the distance between two horizontal cursors.
Example	:CURSor:HDELta? 5.0E-9 Returns the horizontal delta as 5ns.	

Set →

→ Query

:CURSor:V1Position

Description	Sets the first vertical cursor (V1) position.	
Syntax	:CURSor:V1Position {<NRf> ?}	
Parameter	<NRf>	Vertical position. Depends on the vertical scale.
Return parameter	<NR3>	Returns the cursor position.
Example	:CURSor:V1Position 1.6E -1 Sets the V1 cursor position to 160mA.	

Set →

→ Query

:CURSor:V2Position

Description	Sets the first vertical cursor (V2) position.	
Syntax	:CURSor:V2Position {<NRf> ?}	
Parameter	<NRf>	Vertical position. Depends on the vertical scale.
Return parameter	<NR3>	Returns the cursor position.
Example	:CURSor:V2Position 1.1E-1 Sets the V2 cursor position to 110mA.	

:CURSor:VDELta

→ Query

Description	Returns the delta of V1 and V2.	
Syntax	:CURSor:VDELta {?}	

Return Parameter	<code><NR3></code>	Returns the difference between two vertical cursors.
------------------	--------------------------	--

Example :CURSor:VDELta?
 4.00E+0
 Returns the vertical delta as 4 volts.

Set →
 → Query

Description	Sets or queries the horizontal position in XY mode for the X rectangular coordinates for cursor 1 or 2.	
-------------	---	--

Syntax	:CURSor:XY:RECTangular:X:POSition<X> {NRf{?}}	
--------	---	--

Parameter	<code><X></code>	Cursor 1, 2
	<code><NRf></code>	Horizontal position co-ordinates

Return parameter	<code><NR3></code>	Returns the cursor position.
------------------	--------------------------	------------------------------

Example :CURSor:XY:RECTangular:X:POSition1 4.0E-3
 Sets the X-coordinate cursor 1 position to
 40mV/mV.

→ Query

Description	Returns the delta value of cursor 1 and 2 on the X coordinate.	
-------------	--	--

Syntax	:CURSor:XY:RECTangular:X:DELta {?}	
--------	------------------------------------	--

Return Parameter	<code><NR3></code>	Returns the delta value of cursor 1 and 2 as <code><NR3></code> .
------------------	--------------------------	---

Example :CURSor:XY:RECTangular:X:DELta?
 80.0E-3
 Returns the horizontal delta as 80mV.

:CURSor:XY:RECTangular:Y:POSition<X> (Set) →
→ (Query)

Description	Sets or queries the vertical position in XY mode for the Y rectangular coordinates for cursor 1 or 2.	
Syntax	:CURSor:XY:RECTangular:Y:POSition<X> {<NRf?>}	
Parameter	<X>	Cursor 1, 2
	<NRf>	Vertical position co-ordinates
Return parameter	<NR3>	Returns the cursor position.
Example	:CURSor:XY:RECTangular:Y:POSition1 4.0E-3 Sets the Y-coordinate cursor 1 position to 40mV/mV.	

:CURSor:XY:RECTangular:Y:DELta → (Query)

Description	Returns the delta value of cursor 1 and 2 on the Y coordinate.	
Syntax	:CURSor:XY:RECTangular:Y:DELta {?}	
Return Parameter	<NR3>	Returns the delta value of cursor 1 and 2 as <NR3>.
Example	:CURSor:XY:RECTangular:Y:DELta? 80.0E-3 Returns the horizontal delta as 80mV.	

:CURSor:XY:POLar:RADIUS:POSition<X> → (Query)

Description	Queries the polar radius position for the specified cursor in XY mode, where X can be either cursor 1 or 2.	
Syntax	:CURSor:XY:POLar:RADIUS:POSition <X>{?}	
Parameter	<X>	1, 2 (cursor 1, cursor 2)
Return Parameter	<NR3>	Returns the polar radius position.

Example :CURSor:XY:POLar:RADIUS:POSition?
80.0E-3
Returns the polar radius position as 80.0mV.

:CURSor:XY:POLar:RADIUS:DELta 

Description Returns the radius delta value of cursor 1 and 2.

Syntax :CURSor:XY:POLar:RADIUS:DELta {?}

Return Parameter <NR3> Returns the radius delta.

Example :CURSor:XY:POLar:RADIUS:DELta?
31.4E-3
Returns the radius delta as 31.4mV.

:CURSor:XY:POLar:THETA:POSition<X> 

Description Queries the polar angle for the specified cursor in XY mode, where X can be either 1 or 2.

Syntax :CURSor:XY:POLar:THETA:POSition<X> {?}

Parameter <X> 1, 2 (Cursor 1, Cursor 2)

Return parameter <NR3> Returns the polar angle.

Example :CURSor:XY:POLAR:RADIUS:POSition1?
8.91E+1
Returns the polar angle for cursor1 as 89.1°.

:CURSor:XY:POLar:THETA:DELta 

Description Queries the polar angle delta between cursor1 and cursor2.

Syntax :CURSor:XY:POLar:THETA:DELta {?}

Return parameter	<NR3>	Returns the theta delta between cursor1 and cursor2.
Example	:CURSor:XY:POLar:THETA:DELta? 9.10E+0 Returns the delta as 9.1°.	

:CURSor:XY:PRODUct:POSItion<X> → Query

Description	Queries the product in XY mode for the specified cursor, where x can be either 1 or 2.	
Syntax	:CURSor:XY:PRODUct:POSItion<X> {?}	
Parameter	<X>	1, 2 (Cursor 1, Cursor 2)
Return parameter	<NR3>	Returns the product value of the Cursor1 or Cursor2.
Example	:CURSor:XY:PRODUct:POSItion1? 9.44E-5 Returns the product of cursor1 as 94.4uVV.	

:CURSor:XY:PRODUct:DELta → Query

Description	Queries the product delta in XY mode.	
Syntax	:CURSor:XY:PRODUct:DELta {?}	
Return parameter	<NR3>	Returns the product delta.
Example	:CURSor:XY:PRODUct:DELta? 1.22E-5 Returns the product delta as 12.2uVV.	

:CURSor:XY:RATIo:POSItion<X> → Query

Description	Queries the ratio in XY mode for the specified cursor, where x can be either cursor 1 or 2.	
Syntax	:CURSor:XY:RATIo:POSItion<X> {?}	

Parameter	<X>	1, 2 (Cursor 1, Cursor 2)
Return parameter	<NR3>	Returns the ratio.
Example	:CURSor:XY:RATio:POSition? 6.717E+1 Returns the ratio value as 6.717V/V.	

:CURSor:XY:RATio:DELta → Query

Description	Queries the ratio delta in XY mode.	
Syntax	:CURSor:XY:RATio:DELta {?}	
Return parameter	<NR3>	Returns the ratio delta.
Example	:CURSor:XY:RATio:DELta? 5.39E+1 Returns the ratio delta as 53.9V/V.	

Display Commands

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:DISPlay:INTensity:WAVEform Set →
→ Query

Description	Sets or queries the waveform intensity level.	
Syntax	:DISPlay:INTensity:WAVEform {<NRf> ?}	
Parameter	<NRf>	0.0E+0 to 1.0E+2 (0% to 100%)
Return Parameter	<NR3>	Returns the display intensity.
Example	:DISPlay:INTensity:WAVEform 5.0E+1 Sets the waveform intensity to 50%.	

Set →
 → Query

:DISPlay:INTensity:GRATicule

Description	Sets or queries the graticule intensity level.	
Syntax	:DISPlay:INTensity:GRATicule {<NRf> ?}	
Parameter	<NRf>	1.0E+0 to 1.0E+2 (10% to 100%)
Return Parameter	<NR3>	Returns the graticule intensity.
Example	:DISPlay:INTensity:GRATicule 5.0E+1 Sets the graticule intensity to 50%.	



Set →
 → Query

:DISPlay:PERsistence

Description	Sets or queries the waveform persistence level.	
Syntax	:DISPlay:PERsistence { INFINite OFF <NRf> ? }	
Parameter	<NRf>	16E-3, 30E-3, 60E-3, 120E-3, 240E-3, 500E-3, 750E-3, 1, 1.5,2,...,9.5,10 (16mS to 10S)
	INFINite	Infinite persistence
	OFF	No persistence
Return Parameter	<NR3>	Returns the persistence time.
	INFINite	Infinite persistence
	OFF	No persistence
Example	:DISPlay:PERsistence 2.0E+0 Sets the persistence to 2 seconds.	

Set →
 → Query

:DISPlay:GRATicule

Description	Sets or queries graticule display type.			
Syntax	:DISPlay:GRATicule {FULL GRID CROSSs FRAME ?}			
Parameter	FULL		CROSSs	


FRAMe


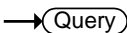


GRID




Return parameter Returns the graticule type.

Example :DISPlay:GRATicule FULL
Sets the graticule to .

		
:DISPlay:WAVEform		
Description	Sets or queries whether the waveforms are drawn as vectors or dots.	
Syntax	:DISPlay:WAVEform {VECTor DOT ?}	
Parameter	VECTor	Vectors
	DOT	Dots
Return parameter	Returns VECTOR or DOT.	
Example	:DISPlay:WAVEform VECTor Sets the waveform to vectors.	



Hardcopy Commands

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:HARDcopy:PRINTINKSaver	73
:HARDcopy:SAVEINKSaver	73
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:HARDcopy:START		
Description	Executing the HARDcopy:START command is the equivalent of pressing the Hardcopy key on the front panel.	
Syntax	:HARDcopy:START	
Related Commands	:HARDcopy:MODE :HARDcopy:PRINTINKSaver :HARDcopy:SAVEINKSaver :HARDcopy:SAVEFORMat :HARDcopy:ASSIGN	

:HARDcopy:MODE  

Description	Sets or queries whether hardcopy is set to print or save.				
Syntax	:HARDcopy:MODE { PRINT SAVE ? }				
Related Commands	:HARDcopy:START				
Parameter	<table border="1"> <tr> <td>PRINT</td> <td>Print mode</td> </tr> <tr> <td>SAVE</td> <td>Save mode</td> </tr> </table>	PRINT	Print mode	SAVE	Save mode
PRINT	Print mode				
SAVE	Save mode				
Return parameter	Returns the mode.(PRINT/SAVE)				
Example	:HARDcopy:MODE PRINT Sets hardcopy to print.				

:HARDcopy:PRINTINKSaver  

Description	Sets Inksaver On or Off for printing.				
Syntax	:HARDcopy:PRINTINKSaver { OFF ON ? }				
Related Commands	:HARDcopy:START :HARDcopy:MODE				
Parameter	<table border="1"> <tr> <td>ON</td> <td>Inksaver ON</td> </tr> <tr> <td>OFF</td> <td>Inksaver OFF</td> </tr> </table>	ON	Inksaver ON	OFF	Inksaver OFF
ON	Inksaver ON				
OFF	Inksaver OFF				
Return parameter	Returns the print Ink Saver mode.(ON/OFF)				
Example	:HARDcopy:PRINTINKSaver ON Sets Ink Saver to ON for printing.				

:HARDcopy:SAVEINKSaver  

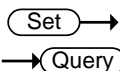
Description	Sets Inksaver On or Off for saving screen images.
Syntax	:HARDcopy:SAVEINKSaver { OFF ON ? }

Related Commands :HARDcopy:START
:HARDcopy:MODE

Parameter	ON	Inksaver ON
	OFF	Inksaver OFF

Return parameter Returns the screen image Ink Saver mode (ON/OFF).

Example :HARDcopy:SAVEINKSaver ON
Sets Inksaver to ON for saving screen images.



:HARDcopy:SAVEFORMat

Description Sets or queries the image save file type.

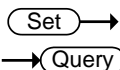
Syntax :HARDcopy:SAVEFORMat { PNG | BMP | ? }

Related Commands :HARDcopy:START
:HARDcopy:MODE

Parameter	PNG	PNG file format
	BMP	BMP file format

Return parameter Returns the image file format (PNG/BMP).

Example :HARDcopy:SAVEFORMat PNG
Sets the file format to PNG.



:HARDcopy:ASSIGN

Description Sets or queries what file type the hardcopy key has been assigned to save.

Syntax :HARDcopy:ASSIGN
{IMAGe | WAVEform | SETUp | ALL | ?}

Related Commands :HARDcopy:START
:HARDcopy:MODE

Parameter	IMAGe	Save image files.
	WAVEform	Save waveforms.

SETUp	Save the panel setup.
-------	-----------------------

ALL	Save All (image, waveform,setup)
-----	----------------------------------

Return parameter Returns the file type.
(IMAGE/WAVEFORM/SETUP/ALL)

Example :HARDcopy:ASSIGN IMAGE.
Set the hardcopy key to save image files.

Measure Commands

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:MEASure:GATing
 Set →
 Query

Description	Sets or queries the measurement gating.	
Syntax	:MEASure:GATing { OFF SCREEn CURSor ? }	
Parameter	OFF	Full record
	SCREEn	Gating set to screen width
	CURSor	Gating between cursors
Return parameter	Returns the gating. (OFF, SCREEN, CURSOR)	
Example	:MEASure:GATing OFF Turns gating off (full record).	

:MEASure:SOURce
 Set →
 Query

Description	Sets or queries the measurement source for source1 or source2.	
Syntax	:MEASure:SOURce<X> { CH1 CH2 CH3 CH4 MATH ? }	
Parameter	<X>	Source1 or source2
	CH1~CH4	Channel 1 to 4
	MATH	Math
Return parameter	Returns the source (CH1, CH2, CH3, CH4, MATH)	
Example	:MEASure:SOURce1 CH1 Sets source1 to channel 1.	

Set →

→ Query

:MEASure:METHOD

Description	Sets or queries the method used to determine the High-Low measurement values.	
Syntax	:MEASure:METHOD { AUTO HISTogram MINMax ? }	
Parameter	AUTO	Set to auto.
	HISTogram	Set to the Histogram method.
	MINMax	Set to the Min-Max method.
Return parameter	Returns the measurement method (AUTO, HISTOGRAM, MINMAX)	
Example	:MEASure:METHOD: AUTO Set the measurement method to auto.	

:MEASure:FALL

→ Query

Description	Returns the fall time measurement result.	
Syntax	:MEASure:FALL{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	:MEASure:SOURce1 CH1 :MEASure:FALL? Selects Channel 1 as the source, and then measures the fall time.	

:MEASure:FOVShoot

→ Query

Description	Returns the fall overshoot amplitude.	
Syntax	:MEASure:FOVShoot{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the fall overshoot as a percentage
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	:MEASure:SOURce1 CH1 :MEASure:FOVShoot? 1.27E+0 Selects Channel 1, and then measures the fall overshoot.	

:MEASure:FPReshoot

→ Query

Description	Returns fall preshoot amplitude.	
Syntax	:MEASure:FPReshoot{?}	
Related Commands	:MEASure:SOURce<X>	
Returns	Returns the fall preshoot as <NR3>.	
Return parameter	<NR3>	Returns the fall preshoot as a percentage.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	

Example :MEASure:SOURce1 CH1
 :MEASure:FPReshoot?
 Selects Channel 1, and then measures the fall preshoot.

:MEASure:FREQuency → Query

Description	Returns the frequency value.	
Syntax	:MEASure:FREQuency{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the frequency in Hz.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	

Example :MEASure:SOURce1 CH1
 :MEASure:FREQuency?
 1.0E+3
 Selects Channel 1, and then measures the frequency.

:MEASure:NWIDth → Query

Description	Returns the first negative pulse width timing.	
Syntax	:MEASure:NWIDth{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the negative pulse width in seconds.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:NWIDth?
 4.995E-04
 Selects Channel 1, and then measures the negative pulse width.

:MEASure:PDUTy → Query

Description Returns the positive duty cycle ratio as percentage.

Syntax :MEASure:PDUTy{?}

Related commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the positive duty ratio.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:PDUTy?
 5.000E+01
 Selects Channel 1, and then measures the positive duty cycle.

:MEASure:PERiod → Query

Description Returns the period.

Syntax :MEASure:PERiod{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the period.
------------------	--------------------	---------------------

Chan Off	Indicates the source channel is not activated.
----------	--

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:PERiod?
 1.0E-3
 Selects Channel 1, and then measures the period.

:MEASure:PWIDth → Query

Description Returns the first positive pulse width.

Syntax :MEASure:PWIDth{?}

Related Commands :MEASure:SOURce<X>

Return parameter <NR3>	Returns the positive pulse width.
Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:PWIDth?
 5.0E-6
 Selects Channel 1, and then measures the positive pulse width.

:MEASure:RISe → Query

Description Returns the first pulse rise time.

Syntax :MEASure:RISe{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the rise time.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:RISe?
 8.5E-6
 Selects Channel 1, and then measures the rise time.

:MEASure:ROVShoot → Query

Description Returns the rising overshoot over the entire waveform in percentage.

Syntax :MEASure:ROVShoot{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the overshoot.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:ROVShoot?
 5.00E+00
 Selects Channel 1, and then measures the rise overshoot.

:MEASure:RPReshoot → Query

Description Returns rising preshoot over the entire waveform in percentage.

Syntax	:MEASure:RPReshoot{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the rising preshoot.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:RPReshoot? 2.13E-2</pre> <p>Selects Channel 1, and then measures the rise preshoot.</p>	

:MEASure:PPULSE



Description	Returns the number of positive pulses.	
Syntax	:MEASure:PPULSE{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the number of positive pulses.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:PPULSE? 6.000E+00</pre> <p>Selects Channel 1, and then measures the number of positive pulses.</p>	

:MEASure:NPULSE

→ Query

Description	Returns the number of negative pulses.	
Syntax	:MEASure:NPULSE{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the number of negative pulses.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:NPULSE? 4.000E+00</pre> Selects Channel 1, and then measures the number of negative pulses.	

:MEASure:PEDGE

→ Query

Description	Returns the number of positive edges.	
Syntax	:MEASure:PEDGE{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the number of positive edges.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:PEDGE?
 1.100E+01
 Selects Channel 1, and then measures the number of positive edges.

:MEASure:NEDGE → Query

Description Returns the number of negative edges.

Syntax :MEASure:NEDGE{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the number of negative edges.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:NEDGE?
 1.100E+01
 Selects Channel 1, and then measures the number of negative edges.

:MEASure:AMplitude → Query

Description Returns the amplitude difference between the Vhigh-Vlow.

Syntax :MEASure:AMplitude{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the amplitude.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example

```
:MEASure:SOURce1 CH1
:MEASure:AMPLitude?
3.76E-3
```

Selects Channel 1, and then measures the amplitude.

:MEASure:MEAN → Query

Description Returns the mean voltage/current of one or more full periods.

Syntax :MEASure:MEAN{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the mean.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example

```
:MEASure:SOURce1 CH1
:MEASure:MEAN?
1.82E-3
```

Selects Channel 1, and then measures the mean value.

:MEASure:CMEan → Query

Description Returns the mean voltage/current of one full period.

Syntax	:MEASure:CMEan{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the cyclic mean.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:CMEan? 9.480E-01</pre> <p>Selects Channel 1, and then measures the mean value of the first period.</p>	

:MEASure:HIGH



Description	Returns the high voltage/current.	
Syntax	:MEASure:HIGH{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the high value.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:HIGH? 3.68E-3</pre> <p>Selects Channel 1, and then measures the high voltage/current.</p>	

:MEASure:LOW

→ Query

Description	Returns the low voltage/current.	
Syntax	:MEASure:LOW{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the global low value.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:LOW? 1.00E-0</pre> Selects Channel 1, and then measures the low current/voltage.	

:MEASure:MAX

→ Query

Description	Returns the maximum amplitude.	
Syntax	:MEASure:MAX{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the maximum amplitude.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	

Example :MEASure:SOURce1 CH1
 :MEASure:MAX?
 1.90E-3
 Selects Channel 1, and then measures the maximum amplitude.

:MEASure:MIN → Query

Description Returns the minimum amplitude.

Syntax :MEASure:MIN{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the minimum amplitude.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:MIN?
 -8.00E-3
 Selects Channel 1, and then measures the minimum amplitude.

:MEASure:PK2PK → Query

Description Returns the peak-to-peak amplitude (difference between maximum and minimum amplitude).

Syntax :MEASure:PK2Pk{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the voltage or current peak to peak measurement.
------------------	--------------------	--

	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:PK2Pk? 2.04E-1</pre> <p>Selects Channel 1, and then measures the peak-to-peak amplitude.</p>	

:MEASure:RMS → Query

Description	Returns the root-mean-square voltage/current of one or more full periods.	
Syntax	:MEASure:RMS{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the RMS value.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:RMS? 1.31E-3</pre> <p>Selects Channel 1, and then measures the RMS voltage/current.</p>	

:MEASure:AREa → Query

Description	Returns the voltage/current area over one or more full periods.	
Syntax	:MEASure:AREa{?}	

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the area value.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:AREa?
 1.958E-03
 Selects Channel 1, and then measures the area.

:MEASure:CARea → (Query)

Description Returns the voltage/current area over one full period.

Syntax :MEASure:CARea{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the area value.
	Chan Off	Indicates the source channel is not activated.

Note Before using this command, select the measurement channel. See the example below.

Example :MEASure:SOURce1 CH1
 :MEASure:CARea?
 1.958E-03
 Selects Channel 1, and then measures the area.

:MEASure:FRRDelay → Query

Description	Returns the delay between the first rising edge of source1 and the first rising edge of source2.	
Syntax	:MEASure:FRRDelay{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.
Note	Select the two source channels before entering this command.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:SOURce2 CH2 :MEASure:FRRDelay? -4.68E-6</pre> Select channel 1 and 2 as source1/2, and then measure FRR.	

:MEASure:FRFDelay → Query

Description	Returns the delay between the first rising edge of source1 and the first falling edge of source2.	
Syntax	:MEASure:FRFDelay{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.
Note	Select the two source channels before entering this command.	

Example :MEASure:SOURce1 CH1
 :MEASure:SOURce2 CH2
 :MEASure:FRFDelay?
 3.43E-6
 Select channel 1 and 2 as source1/2, and then measure FRF.

:MEASure:FFRDelay → Query

Description Returns the delay between the first falling edge of source1 and the first rising edge of source2.

Syntax :MEASure:FRRDelay {?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.

Note Select the two source channels before entering this command.

Example :MEASure:SOURce1 CH1
 :MEASure:SOURce2 CH2
 :MEASure:FRRDelay?
 -8.56E-6
 Select channel 1 and 2 as delay source1/2, and then measure FFR.

:MEASure:FFFDelay → Query

Description Returns the delay between the first falling edge of source1 and the first falling edge of source2.

Syntax :MEASure:FFFDelay{?}

Related Commands :MEASure:SOURce<X>

Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.
Note	Select the two source channels before entering this command.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:SOURce2 CH2 :MEASure:FFFDelay? -8.89E-6</pre> <p>Select channel 1 and 2 as delay source1/2, and then measure FFF.</p>	

:MEASure:LRRDelay

Description	Returns the delay between the first rising edge of source1 and the last rising edge of source2.	
Syntax	:MEASure:LRRDelay{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.
Note	Select the two source channels before entering this command.	
Example	<pre>:MEASure:SOURce1 CH1 :MEASure:SOURce2 CH2 :MEASure:LRRDelay? -8.89E-6</pre> <p>Select channel 1 and 2 as delay source1/2, and then measure LRR.</p>	

:MEASure:LRFDelay → Query

Description	Returns the delay between the first rising edge of source1 and the last rising edge of source2.	
Syntax	:MEASure:LRFDelay{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.
Note	Select the two source channels before entering this command.	
Example	:MEASure:SOURce1 CH1 :MEASure:SOURce2 CH2 :MEASure:LRFDelay? -4.99E-6 Select channel 1 and 2 as delay source1/2, and then measure LRF.	

:MEASure:LFRDelay → Query

Description	Returns the delay between the first falling edge of source1 and the last rising edge of source2.	
Syntax	:MEASure:LFRDelay{?}	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.
Note	Select the two source channels before entering this command.	

Example :MEASure:SOURce1 CH1
 :MEASure:SOURce2 CH2
 :MEASure:LFRDelay?
 -9.99E-6
 Select channel 1 and 2 as delay source1/2, and
 then measure LFR.

:MEASure:LFFDelay → **Query**

Description Returns the delay between the first falling edge of
 source1 and the last falling edge of source2.

Syntax :MEASure:LFFDelay{?}

Related :MEASure:SOURce<X>
 Commands

Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.

Note Select the two source channels before entering this
 command.

Example :MEASure:SOURce1 CH1
 :MEASure:SOURce2 CH2
 :MEASure:LFFDelay?
 -9.99E-6
 Select channel 1 and 2 as delay source1/2, and
 then measure LFF.

:MEASure:PHAsE → **Query**

Description Returns the phase between source 1 and source 2.

Syntax :MEASure:PHAsE{?}

Related :MEASure:SOURce<X>
 Commands


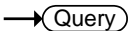
Return parameter	<NR3>	Returns the phase difference.
	Chan Off	Indicates the source channel is not activated.

Note Select the two source channels before entering this command.

Example :MEASure:SOURce1 CH1
 :MEASure:SOURce2 CH2
 :MEASure:PHase?
 4.50E+01
 Select channel 1 and 2 as phase source1/2, and then measure the phase in degrees.

Measurement Commands

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:MEASUrement:STATIstics	105

:MEASUrement:MEAS<X>:SOURCE<X>  

Description	Sets or queries the measurement source for a selected automatic measurement. This is a statistics related command.	
Syntax	:MEASUrement:MEAS<X>:SOURCE<X> { CH1 CH2 CH3 CH4 MATH D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 ? }	
Related commands	:MEASUrement:MEAS<X>:TYPE	
Parameter	MEAS<X>	The automatic measurement number from 1 to 8.
	SOURCE<X>	SOURCE1: the source for all single channel measurements.
	SOURCE<X>	SOURCE2: the source for all delay or phase measurements.
	CH1 to CH4	Channel 1, 2, 3, 4
	MATH	Math source
	D0 to D15	Digital channel sources D0 to D15

Return parameter	CH1 to CH4	Channel 1, 2, 3, 4
	MATH	Math source
	D0 to D15	Digital channel sources D0 to D15

Example :MEASUrement:MEAS1:SOURCE1
 CH1
 Returns the (first) source for measurement 1.

:MEASUrement:MEAS<X>:TYPE



Description Sets or queries the measurement type for a selected automatic measurement. This is a statistics related command.

Syntax :MEASUrement:MEAS<X>:TYPE
 {PK2pk | MAXimum | MINIMUM | AMPLitude | HIGH | LOW | MEAN | CMEan | RMS | CRMs | AREa | CAREa | ROVShoot | FOVShoot | RPReshoot | FPReshoot | FREQuency | PERIod | RISe | FALL | PWIdth | NWIdth | PDUTy | PPULSE | NPULSE | PEDGE | NEDGE | FRRDelay | FRFDelay | FFRDelay | FFFDelay | LRRDelay | LRFDelay | LFRDelay | LFFDelay | PHAse | ?}

Related commands :MEASUrement:MEAS<X>:SOURCE<X>

Parameter	MEAS<X>	The automatic measurement number from 1 to 8.
-----------	---------	---

Return parameter Returns the measurement type

Example :MEASUrement:MEAS1:TYPE RMS
 Sets measurement 1 to RMS measurement.

:MEASUrement:MEAS<X>:STATE



Description Sets or queries the state of a selected measurement. This is a statistics related command.

Syntax :MEASUrement:MEAS<X>:STATE { ON | OFF | 1 | 0 | ? }

Related commands :MEASUrement:MEAS<X>:SOURce<X>
:MEASUrement:MEAS<X>:TYPE

Parameter	MEAS<X>	The automatic measurement number from 1 to 8.
	ON/1	Turn the measurement on.
	OFF/0	Turn the measurement off.

Return parameter	0	Measurement is off.
	1	Measurement is on.

Example :MEASUrement:MEAS1:STATE 1
Turns measurement 1 on.

:MEASUrement:MEAS<X>:VALue → Query

Description Returns the measurement results for the selected measurement. This is a statistics related command.

Syntax :MEASUrement:MEAS<X>:VALue?

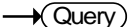
Related Commands :MEASUrement:SOURce<X>

Return parameter	MEAS<X>	The automatic measurement number from 1 to 8.
------------------	---------	---

Note The measurement source(s), measurement number, measurement type and measurement state must first be set before a measurement result can be returned.

Example :MEASUrement:MEAS1:SOUrce1 CH1
 :MEASUrement:MEAS1:TYPe PK2PK
 :MEASUrement:MEAS1:STATE ON
 :MEASUrement:MEAS1:VALue?
 5.000E+0

Selects channel 1 as the source for measurement 1, sets measurement 1 to peak to peak measurement and then turns on the measurement. The result returns the peak to peak measurement.

:MEASUrement:MEAS<X>:MAXimum 

Description Returns the maximum measurement results for the selected measurement from the last time the statistics were reset. This is a statistics related command.

Syntax :MEASUrement:MEAS<X>:MAXimum?

Related Commands :MEASUrement:STATIstics:MODE

Parameter	MEAS<X>	The automatic measurement number from 1 to 8.
-----------	---------	---

Example :MEASUrement:MEAS3:SOUrce1 CH1
 :MEASUrement:MEAS3:TYPe PK2PK
 :MEASUrement:MEAS3:STATE ON
 :MEASUrement:STATIstics:MODE ON
 :MEASUrement:MEAS3:MAXimum?
 2.800E-02

Returns the maximum measurement result for measurement number 3.

:MEASUrement:MEAS<X>:MEAN

→ Query

Description Returns the mean measurement results for the selected measurement from the last time the statistics were reset. This is a statistics related command.

Syntax :MEASUrement:MEAS<X>:MEAN?

Related Commands :MEASUrement:STATIstics:MODE

Parameter MEAS<X> The automatic measurement number from 1 to 8.

Example

```
:MEASUrement:MEAS3:SOUrce1 CH1
:MEASUrement:MEAS3:TYPe PK2PK
:MEASUrement:MEAS3:STATE ON
:MEASUrement:STATIstics:MODE ON
:MEASUrement:MEAS3:MEAN?
2.090E-02
```

Returns the mean measurement result for measurement number 3.

:MEASUrement:MEAS<X>:MINIum

→ Query

Description Returns the minimum measurement results for the selected measurement from the last time the statistics were reset. This is a statistics related command.

Syntax :MEASUrement:MEAS<X>:MINIum?

Related Commands :MEASUrement:STATIstics:MODE

Parameter MEAS<X> The automatic measurement number from 1 to 8.

Example :MEASUrement:MEAS3:SOUrce1 CH1
 :MEASUrement:MEAS3:TYPe PK2PK
 :MEASUrement:MEAS3:STATE ON
 :MEASUrement:STATIstics:MODE ON
 :MEASUrement:MEAS3:MINImum?
 1.600E-02
 Returns the minimum measurement result for measurement number 3.

:MEASUrement:MEAS<X>:STDdev → Query

Description Returns the standard deviation for the selected measurement from the last time the statistics were reset. This is a statistics related command.

Syntax :MEASUrement:MEAS<X>:STDdev?

Related Commands :MEASUrement:STATIstics:MODE

Parameter	MEAS<X>	The automatic measurement number from 1 to 8.
-----------	---------	---

Example :MEASUrement:MEAS3:SOUrce1 CH1
 :MEASUrement:MEAS3:TYPe PK2PK
 :MEASUrement:MEAS3:STATE ON
 :MEASUrement:STATIstics:MODE ON
 :MEASUrement:MEAS3:STDdev?
 1.530E-03
 Returns the standard deviation for measurement number 3.

:MEASUrement:STATIstics:MODE Set →
→ Query

Description Puts the statics measurement results on the display or queries whether the statics are displayed.

Syntax :MEASUREMENT:STATISTICS:MODE {OFF | ON | ?}

Related commands :MEASUREMENT:STATISTICS

Parameter/ Return parameter	ON	Display the statistics on the screen.
	OFF	Remove the statistics from the screen

Example :MEASUREMENT:STATISTICS:MODE ON
Displays statistics on the screen.

Set →
 → Query

:MEASUREMENT:STATISTICS:WEIGHTING

Description Sets and queries the number of samples used for the statistics calculations.

Syntax :MEASUREMENT:STATISTICS:WEIGHTING { <NR1> | ? }

Parameter/ Return parameter	<NR1>	Number of samples (2~1000)
--------------------------------	-------	----------------------------

Example :MEASUREMENT:STATISTICS:WEIGHTING 5
Sets the number of samples to 5.

:MEASUREMENT:STATISTICS Set →

Description Resets the statics calculations. This command will clear all the currently accumulated measurements.

Syntax :MEASUREMENT:STATISTICS

Reference Commands

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:REF<X>:DISPlay



Description Sets or queries a reference waveform to be shown on the display. A reference waveform must first be saved before this command can be used.

Syntax :REF<x>:DISPlay { OFF| ON| ? }

Parameter	<X>	Reference waveform 1, 2, 3 ,4.
	OFF	Turns the selected reference waveform off
	ON	Turns the selected reference waveform on

Return parameter Returns the status of the selected reference waveform. (OFF, ON)

Example :REF1:DISPlay ON
Turns on reference1 (REF 1) on the display.

:REF<X>:TIMebase:POSition



Description Sets or returns the selected reference waveform time base position.

Syntax :REF<X>:TIMebase:POSition { <NRf> | ? }

Related commands :REF<X>:DISPlay

Parameter	<X>	Reference waveform 1, 2, 3 ,4.
	<NRf>	Horizontal co-ordinates

Return parameter	<NR3>	Returns the reference waveform position
------------------	-------	---

Example :REF1:TIMEbase:POSition -5.000E-5
 Selects reference 1, and then sets the horizontal position to -50us.

Set →

→ Query

:REF<X>:TIMEbase:SCALE

Description Sets or returns the selected reference waveform time base scale.

Syntax :REF<X>:TIMEbase:SCALE { <NRf> | ?}

Related commands :REF<X>:DISPlay

Parameter	<X>	Reference waveform 1, 2, 3 ,4.
	<NRf>	Horizontal scale

Return parameter	<NR3>	Returns the reference waveform scale.
------------------	-------	---------------------------------------

Example :REF1:TIMEbase:SCALE 5.00E-4
 Selects reference 1, and then sets the horizontal scale to 500us/ div.

Set →

→ Query

:REF<X>:OFFSet

Description Sets or returns the selected reference waveform vertical position (offset).

Syntax :REF<X>:OFFSet { <NRf> | ?}

Related commands :REF<X>:DISPlay

Parameter	<X>	Reference waveform 1, 2, 3 ,4.
	<NRf>	Vertical offset

Return parameter	<NR3>	Returns the reference waveform vertical position.
------------------	-------	---

Example :REF1:OFFSet -5.000E-2
 Selects reference 1, and then sets the vertical position to -50mV/mA.

:REF<x>:SCALE  

Description	Sets or returns the selected reference waveform vertical scale.	
Syntax	:REF<x>:SCALE { <NRf> ? }	
Related commands	:REF<X>:DISPlay	
Parameter	<X>	Reference waveform 1, 2, 3 ,4.
	<NRf>	Vertical scale
Return parameter	<NR3>	Returns the reference waveform vertical scale.

Example :REF1:SCALE 5.000E-2
 Selects reference 1, and then sets the vertical scale to 50mV | mA/div.

Run Command

:RUN

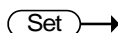


Description	The run command allows the oscilloscope to continuously make acquisitions (equivalent to pressing the Run key on the front panel).
-------------	--

Syntax	:RUN
--------	------

Stop Command

:STOP



Description	The stop command stops the oscilloscope making further acquisitions (equivalent to pressing the Stop key on the front panel).
-------------	---

Syntax	:STOP
--------	-------

Single Command

:SINGle



Description	The single command allows the oscilloscope to capture a single acquisition when trigger conditions have been fulfilled (equivalent to pressing the Single key on the front panel).
-------------	--

Syntax	:SINGle
--------	---------

Force Command

:FORCe



Description	The Force command forces an acquisition (equivalent to pressing the Force-Trig key on the front panel).
-------------	---

Syntax	:FORCe
--------	--------

Timebase Commands

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Set →
 → Query

:TIMebase:POSition

Description	Sets or queries the horizontal position.	
Syntax	:TIMebase:POSition {<NRf> ?}	
Parameter	<NRf>	Horizontal position
Return parameter	<NR3>	Returns the horizontal position.
Example	:TIMebase:POSition 5.00E-4 Sets the horizontal position as 500us.	

Set →
 → Query

:TIMebase:SCALe

Description	Sets or queries the horizontal scale.	
Syntax	:TIMebase:SCALe {<NRf> ?}	
Parameter	<NRf>	Horizontal scale
Return parameter	<NR3>	Returns the horizontal scale.
Example	:TIMebase:SCALe 5.00E-2 Sets the horizontal scale to 50ms/div.	

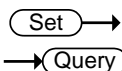
Set →
 → Query

:TIMebase:MODE

Description	Sets or queries the time base mode. The time base mode determines the display view window on the scope.	
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Syntax	:TIMebase:MODE {MAIN WINDow XY ?}	
Parameter	MAIN	Sets the time base mode to the main screen.
	WINDow	Sets the time base mode to the zoom window.
	XY	Sets the time base mode to the XY display.
Return parameter	Returns the time base mode (MAIN, WINDOW, XY)	

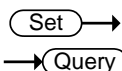
Example :TIMebase:MODE MAIN
Sets the time base mode to the main mode.



:TIMebase:WINDow:POSition

Description	Sets or queries the zoom horizontal position.	
Syntax	:TIMebase:WINDow:POSition {<NRf> ?}	
Related commands	:TIMebase:MODE	
Parameter	<NRf>	Horizontal position for zoom window
Return parameter	<NR3>	Returns the zoom horizontal position.

Example :TIMebase:WINDow:POSition 2.0E-3
Sets the zoom horizontal position as 20ms.



:TIMebase:WINDow:SCALE

Description	Sets or queries the zoom horizontal scale.	
Note	If the oscilloscope is under "ZOOM" mode, the main timebase function will be disabled and cannot be modified.	
Syntax	:TIMebase:WINDow:SCALE {<NRf> ?}	
Related commands	:TIMebase:MODE	

Parameter	<NRf>	Zoom horizontal scale. The range will depend on the time base.
Return parameter	<NR3>	Returns the zoom horizontal scale.
Example	:TIMebase:WINDow:SCALE 2.0E-3 Sets the zoom horizontal scale to 2ms.	

Trigger Commands

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:TRIGger:FREQuency

→ Query

Description	Queries the trigger frequency.
Syntax	:TRIGger:FREQuency{?}
Return parameter	<NR3> Returns the trigger frequency.

Example :TRIGger:FREQuency?
1.032E+3
Returns the trigger frequency.

Set →

:TRIGger:TYPe

→ Query

Description	Sets or queries the trigger type.	
Syntax	:TRIGger:TYPe {EDGE DELay PULSEWidth VIDEo RUnt RISEFall LOGic BUS TIMEOut ? }	
Parameter	EDGE	Edge trigger
	DELay	Delay trigger
	PULSEWidth	Pulse width trigger
	VIDeo	Video trigger
	RUnt	Runt trigger
	RISEFall	Rise and fall trigger
	LOGic	Logic trigger
	BUS	Bus trigger
	TIMEOut	Timeout trigger

Return parameter Returns the trigger type.

Example :TRIGger:TYPe EDGE
Sets the trigger type to edge.

Set →

:TRIGger:SOURce

→ Query

Description	Sets or queries the trigger source.	
Syntax	:TRIGger:SOURce { CH1 CH2 CH3 CH4 EXT LiNe D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 ? }	
Parameter	CH1 to CH4	Channel 1 to channel 4
	EXT	External source

LINE	AC Line
D0 to D15	Digital channels 1 to 15

Return parameter Returns the trigger source.

Example :TRIGger:SOURce CH1
Sets the trigger source to channel 1.

Set →

→ Query

:TRIGger:COUPLE

Description Sets or queries the trigger coupling.

Note Applicable for edge and delay triggers only.

Syntax :TRIGger:COUple {AC | DC | ?}

Parameter	AC
	DC

Return parameter Returns the trigger coupling.

Example :TRIGger:COUple AC
Sets the trigger coupling to AC.

Set →

→ Query

:TRIGger:NREJ

Description Sets or queries noise rejection status.

Syntax :TRIGger:NREJ {OFF | ON | ?}

Parameter	OFF	Turns noise rejection off
	ON	Turns noise rejection on

Return parameter Returns the noise rejection status (ON, OFF).

Example :TRIGger:NREJ ON
Turns noise rejection on.

Set →

→ Query

:TRIGger:REject

Description Sets or queries the frequency rejection status.

Syntax	:TRIGger:REject {OFF HF LF ?}	
Parameter	OFF	Frequency rejection off.
	HF	High frequency filter on
	LF	Low frequency filter on
Return parameter	Returns the status of the frequency filter.	
Example	:TRIGger:REject OFF Turns the frequency filter off.	

Set →

→ Query

:TRIGger:MODE

Description	Sets or queries the trigger mode.	
Syntax	:TRIGger:MODE {AUTo NORMAl ?}	
Parameter	AUTo	Auto trigger (Untriggered roll)
	NORMAl	Normal trigger
Return parameter	Returns the trigger mode.	
Example	:TRIGger:MODE NORMAl Sets the trigger mode to normal.	

Set →

→ Query

:TRIGger:HOLDoff

Description	Sets or queries the holdoff time.	
Syntax	:TRIGger:HOLDoff {<NRf> ?}	
Parameter	<NRf>	Holdoff time
Return parameter	<NR3>	Returns the trigger holdoff time.
Example	:TRIGger:HOLDoff 1.00E-8 Sets the trigger holdoff time to 10ns.	

Set →

→ Query

:TRIGger:LEVel

Description	Sets or queries the level.	
-------------	----------------------------	--

Syntax :TRIGger:LEVel {TTL | ECL | SETTO50 | <NRf> | ?}

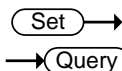
Related commands :TRIGger:TYPe

Parameter	<NRf>	Trigger level value
	TTL	Sets the trigger level to TTL.
	ECL	Sets the trigger level to ECL.
	SETTO50	Sets the trigger level to the User level (50% by default).

Return parameter <NR3> Returns the trigger level.

Example1 :TRIGger:LEVel TTL
Sets the trigger to TTL.

Example2 :TRIGger:LEVel 3.30E-1
Sets the trigger level to 330mV/mA.



:TRIGger:HLEVel

Description Sets or queries the high trigger level.

Note Applicable for Rise and Fall/Pulse Runt triggers.

Syntax :TRIGger:HLEVel {TTL | ECL | <NRf> | ?}

Related commands :TRIGger:TYPe

Parameter	<NRf>	High level value.
	TTL	Sets the high trigger level to TTL.
	ECL	Sets the high trigger level to ECL.

Return parameter <NR3> Returns the trigger high level.

Example1 :TRIGger:HLEVel TTL
Sets the trigger high level to TTL.

Example2 :TRIGger:HLEVel 3.30E-1
Sets the trigger high level to 330mV/mA.

Set →

→ Query

:TRIGger:LLEVel

Description Sets or queries the low trigger level.

Note Applicable for Rise and Fall/Pulse Runt triggers.

Syntax :TRIGger:LLEVel {TTL | ECL| <NRf> | ?}

Related commands :TRIGger:TYPe

Parameter	<NRf>	Low level value.
	TTL	Sets the low trigger level to TTL.
	ECL	Sets the log trigger level to ECL.

Return parameter <NR3> Returns the trigger low level.

Example1 :TRIGger:LLEVel TTL
 Sets the trigger low level to TTL.

Example2 :TRIGger:LLEVel -3.30E-3
 Sets the trigger low level to -330mV/mA.

Set →

→ Query

:TRIGger:EDGE:SLOP

Description Sets or queries the trigger slope.

Syntax :TRIGger:EDGE:SLOP {RISe | FALL | EITHer | ?}

Related commands :TRIGger:TYPe

Parameter	RISe	Rising slope
	FALL	Falling slope
	EITHer	Either rising or falling slope

Return parameter Returns the trigger slope.

Example :TRIGger:EDGE:SLOP FALL
 Sets the trigger slope to falling.

:TRIGger:DElay:SLOP




Description	Sets or queries the trigger slope for the delay trigger.	
Syntax	:TRIGger:DElay:SLOP {RISe FALL EITHer ?}	
Related commands	:TRIGger:TYPe	
Parameter	RISe	Rising slope
	FALL	Falling slope
	EITHer	Either rising or falling slope
Return parameter	Returns the trigger slope.	
Example	:TRIGger:DElay:SLOP FALL Sets the trigger slope to falling.	

:TRIGger:DElay:TYPe




Description	Sets or queries the trigger delay type.	
Syntax	:TRIGger:DElay:TYPe {TImE EVEnt ?}	
Related commands	:TRIGger:TYPe	
Parameter	TImE	Sets the delay type to time.
	EVEnt	Sets the delay type to event.
Return parameter	Returns the trigger delay type.	
Example	:TRIGger:DElay:TYPe TImE Sets the delay type to time delay.	

:TRIGger:DElay:TIIME




Description	Sets or queries the delay time value.	
Syntax	:TRIGger:DElay:TIIME {<NRf> ?}	

Related commands :TRIGger:DElay:TYPe

Parameter <NRf> Delay time (1.00E-8~1.00E+1)

Return parameter <NR3> Returns the delay time.

Example :TRIGger:DElay:TIME 1.00E-6
Sets the delay time to 1us.

Set →

→ Query

:TRIGger:DElay:EVENT

Description Sets or queries the number of events for the event delay trigger.

Syntax :TRIGger:DElay:EVENT {<NR1> | ?}

Related commands :TRIGger:DElay:TYPe

Parameter <NR1> 1~65535 events

Return parameter <NR1> Returns the number of events.

Example :TRIGger:DElay:EVENT 2
Sets the number of events to 2.

Set →

→ Query

:TRIGger:DElay:LEVel

Description Sets or queries the trigger delay level.

Syntax :TRIGger:DElay:LEVel {<NRf> | ?}

Parameter <NRf> Delay trigger level

Return parameter <NR3> Returns the delay trigger.

Example :TRIGger:DElay:LEVel 5.00E-3
Sets the delay trigger to 5mV/mA.

Set →

→ Query

:TRIGger:PULSEWidth:POLarity

Description Sets or queries the pulse width trigger polarity.

Syntax	:TRIGger:PULSEWidth:POLarity {POSitive NEGative ?}	
Related commands	:TRIGger:TYPe	
Parameter	POSitive	Positive polarity
	NEGative	Negative polarity
Return parameter	Returns the pulse width polarity.	
Example	:TRIGger:PULSEWidth:POLarity POSitive Sets the pulse width polarity to positive.	

:TRIGger:RUNT:POLarity
 Set →
 → Query

Description	Sets or queries the Pulse Runt trigger polarity.	
Syntax	:TRIGger:RUNT:POLarity { POSitive NEGative EITher ? }	
Related commands	:TRIGger:TYPe	
Parameter	POSitive	Positive polarity
	NEGative	Negative polarity
	EITher	Positive or negative polarity
Return parameter	Returns the pulse runt trigger polarity.	
Example	:TRIGger:RUNT:POLarity POSitive Sets the Pulse Runt trigger polarity to positive.	

:TRIGger:RUNT:WHEN
 Set →
 → Query

Description	Sets or queries the Pulse Runt trigger conditions.	
Syntax	:TRIGger:RUNT:WHEN {THAN LESSthan EQUAL UNEQual ? }	
Related commands	:TRIGger:TYPe :TRIGger:RUNT:TIME	

Parameter	THAN	>
	LESSthan	<
	Equal	=
	UNEQual	≠

Return parameter Returns the pulse runt trigger condition.

Example :TRIGger:RUNT:WHEn UNEQual
Sets the Pulse Runt trigger condition to unequal (≠).

Set →
 → Query

:TRIGger:RUNT:TIME

Description Sets or queries the Pulse Runt trigger time.

Syntax :TRIGger:RUNT:TIME {<NRf> | ? }

Related commands :TRIGger:TYPE
:TRIGger:RUNT:WHEn

Parameter	<NRf>	Pulse runt time (4nS to 10S)
Return Parameter	<NR3>	Returns the runt time in seconds.

Example :TRIGger:RUNT:TIME 4.00E-5
Sets the runt time to 40.0uS.

Set →
 → Query

:TRIGger:RISEFall:SLOP


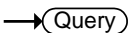
Description Sets or queries the Rise & Fall slope.

Syntax :TRIGger:RISEFall:SLOP {RISe | FALL | EITHer | ? }

Parameter	RISe	Rising slope
	FALL	Falling slope
	EITHer	Either rising or falling slope

Return parameter Returns the rise & fall slope.

Example :TRIGger:RISEFall:SLOP RISe
Sets the Rise & Fall slope to rising.

:TRIGger:RISEFall:WHEn



Description	Sets or queries the rise/fall trigger conditions	
Syntax	:TRIGger:RISEFall:WHEn { THAN LESSthan Equal UNEQual ? }	
Related commands	:TRIGger:TYPE :TRIGger:RISEFall:TIME	
Parameter	THAN	>
	LESSthan	<
	Equal	=
	UNEQual	≠

Return parameter Returns the rise/fall trigger condition.

Example :TRIGger:RISEFall:WHEn UNEQual
Sets the Rise and Fall trigger condition to unequal (≠).

:TRIGger:RISEFall:TIME



Description	Sets or queries the Rise and Fall time.	
Syntax	:TRIGger:RISEFall:TIME {<NRf> ? }	
Related commands	:TRIGger:TYPE :TRIGger:RISEFall:WHEn	
Parameter	<NRf>	Rise and Fall time (4nS to 10S)
Return Parameter	<NR3>	Returns the rise and fall time in seconds.

Example :TRIGger:RISEFall:TIME 4.00E-5
Sets the trigger rise & fall to 40.0us.

Set →

→ Query

:TRIGger:VIDeo:TYPe

Description Sets or queries the video trigger type.

Syntax :TRIGger:VIDeo:TYPe {NTSC | PAL | SECam | ?}

Related commands :TRIGger:TYPe

Parameter	NTSC	NTSC
	PAL	PAL
	SECam	SECAM

Return parameter Returns the video trigger type.

Example :TRIGger:VIDeo:TYPe NTSC
 Sets the video trigger to NTSC.

Set →

→ Query

:TRIGger:VIDeo:FIELD

Description Sets or queries the video trigger field.

Syntax :TRIGger:VIDeo:FIELD { FIELD1 | FIELD2 | ALLFields | ALLLines | ? }

Related commands :TRIGger:TYPe

Parameter	FIELD1	Trigger on field 1
	FIELD2	Trigger on field 2
	ALLFields	Trigger on all fields
	ALLLines	Trigger on all lines

Return parameter Returns the video trigger field.

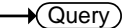
Example :TRIGger:VIDeo:FIELD ALLFields
 Sets the video trigger to trigger on all fields.

:TRIGger:VIDeo:LIne




Description	Sets or queries the video trigger line.	
Syntax	:TRIGger:VIDeo:LIne {<NR1> ?}	
Related commands	:TRIGger:TYPe	
Parameter	<NR1>	Video line
Return parameter	<NR3>	Returns the video trigger line.
Example	:TRIGger:VIDeo:LIne 1 Sets the video trigger to line 1.	

:TRIGger:VIDeo:POLarity

Description	Sets or queries the video trigger polarity.	
Syntax	:TRIGger:VIDeo:POLarity { POSitive NEGative ? }	
Related commands	:TRIGger:TYPe	
Parameter	POSitive NEGative	Positive polarity Negative polarity
Return parameter	Returns the video trigger polarity.	
Example	:TRIGger:VIDeo:POLarity POSitive Sets the video trigger polarity to positive.	

:TRIGger:PULSe:WHEn

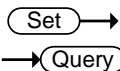



Description	Sets or queries the pulse width trigger conditions.	
Syntax	:TRIGger:PULSe:WHEn { THAN LESSthan Equal UNEQual ? }	
Related commands	:TRIGger:TYPe :TRIGger:PULSe:TIME	

Parameter	THAN	>
	LESSthan	<
	EQual	=
	UNEQual	≠

Return parameter Returns the pulse width trigger conditions.

Example :TRIGger:PULSe:WHEn UNEQual
 Sets the trigger pulse width conditions to not equal to (≠).



:TRIGger:PULSe:TIME

Description Sets or queries the pulse width time.

Syntax :TRIGger:PULSe:TIME {<NRf> | ?}

Related commands :TRIGger:TYPe
 :TRIGger:PULSe:WHEn

Parameter <NRf> Pulse width time (4ns~10s)

Return parameter <NR3> Returns the pulse width time in seconds.

Example :TRIGger:PULSe:TIME 4.00E-5
 Sets the trigger pulse width to 40.0us.

Set →
 → Query

:TRIGger:ALternate

Description	Sets alternating between source triggers on or off or queries its state.	
Syntax	:TRIGger:ALternate {OFF ON ?}	
Parameter	OFF	Alternate off
	ON	Alternate on
Return parameter	Returns the Alternate trigger status (ON, OFF).	
Example	:TRIGger:ALternate ON Turns on alternating between source triggers.	

→ Query


:TRIGger:STATe

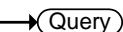
Description	Returns the current state of the triggering system.	
Syntax	:TRIGger:STATe?	
Return parameter	*ARMED	Indicates that the oscilloscope is acquiring pretrigger information.
	*AUTO	Indicates that the oscilloscope is in the automatic mode and acquires data even in the absence of a trigger.
	*READY	Indicates that all pretrigger information has been acquired and that the oscilloscope is ready to accept a trigger.
	*SAVE	Indicates that the oscilloscope is in save mode and is not acquiring data.
	*TRIGGER	Indicates that the oscilloscope triggered and is acquiring the post trigger information.
Example	:TRIGger:STATe? AUTO The trigger is in auto mode.	

:TRIGger:EXTERnal:PRObe:TYPe




Description	Sets or queries the external probe type.	
Syntax	:TRIGger:EXTERnal:PRObe:TYPe { VOLTage CURRent ? }	
Related commands	:TRIGger:EXTERnal:PRObe:RATio	
Parameter	VOLTage	Voltage
	CURRent	Current
Return parameter	Returns the probe type.	
Example	:TRIGger:EXTERnal:PRObe:TYPe? CURRENT	

:TRIGger:EXTERnal:PRObe:RATio




Description	Sets or queries the external probe ratio (attenuation).	
Syntax	:TRIGger:EXTERnal:PRObe:RATio {<NRf> ?}	
Related commands	:TRIGger:EXTERnal:PRObe:TYPe	
Parameter	<NRf>	External probe attenuation factor.
Return parameter	<NR3>	Returns the probe attenuation factor.
Example	:TRIGger:EXTERnal:PRObe:RATio? 5.000000e+01	

:TRIGger:BUS:TYPe


Description	Returns the current bus type.	
Syntax	:TRIGger:BUS:TYPe?	
Return parameter	12C	I2C mode

SPI	SPI mode
UART	UART mode
PARALLEL	Parallel mode

Example :TRIGger:BUS:TYPE?
UART

:TRIGger:BUS:B1:I2C:CONDition

Set →

← Query

Description Sets or queries the I²C trigger conditions.

Syntax :TRIGger:BUS:B1:I2C:CONDition
{START | STOP | REPEATstart | ACKMISS | ADDRess | DATA | ADDRANDDATA | ? }

Parameter	START	Set Start as the I ² C trigger condition.
	STOP	Set Stop as the I ² C trigger condition.
	REPEATstart	Set Repeat of Start as the I ² C trigger condition.
	ACKMISS	Set Missing Acknowledgement as the I ² C trigger condition.
	ADDRess	Set Address as the I ² C trigger condition.
	DATA	Set Data as the I ² C trigger condition.
	ADDRANDDATA	Set Address and Data as the I ² C trigger condition.

Return parameter Returns the I²C bus trigger condition.

Example :TRIGger:BUS:B1:I2C:CONDition ADDRess
Set Address as the I2C trigger condition.

Set →
 → Query

:TRIGger:BUS:B1:I2C:ADDRess:MODE

Description	Sets or queries the I ² C addressing mode (7 or 10 bits).	
Syntax	:TRIGger:BUS:B1:I2C:ADDRess:MODE {ADDR7 ADDR10 ? }	
Related commands	:TRIGger:BUS:B1:I2C:CONDition	
Parameter	ADDR7	7 bit addressing
	ADDR10	10 bit addressing
Return Parameter	0	7 bit addressing
	1	10 bit addressing
Example	:TRIGger:BUS:B1:I2C:ADDRess:MODE? 0 The addressing mode is current set to 7 bits.	

Set →
 → Query

:TRIGger:BUS:B1:I2C:ADDRess:TYPE

Description	Sets the I ² C bus address type, or queries what the setting is.	
Syntax	:TRIGger:BUS:B1:I2C:ADDRess:TYPE {GENeralcall STARTbyte HSmode EEPROM CBUS ?}	
Related commands	:TRIGger:BUS:B1:I2C:CONDition	
Parameter	GENeralcall	Set a general call address (0000 000 0).
	STARTbyte	Set a start byte address. (0000 000 1)
	HSmode	Set a high-speed mode address. (0000 1xx x)
	EEPROM	Set an EEPROM address. (1010 xxx x)
	CBUS	Set a CBUS address. (0000 001 x)

Return Parameter Returns the address type

Example :TRIGger:BUS:B1:I2C:ADDRes:TYPe?
CBUS

:TRIGger:BUS:B1:I2C:ADDRes:VALue  

Description Sets or queries the I²C bus address value when the I²C bus is set to trigger on Address or Address/Data.

Syntax :TRIGger:BUS:B1:I2C:ADDRes:VALue {string | ? }

Related commands :TRIGger:BUS:B1:I2C:ADDRes:MODE

Parameter	<code><string></code>	7/10 characters, must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0
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Return Parameter Returns the address value.

Example1 :TRIGger:BUS:B1:I2C:ADDRes:VALue "xxx0101"
Sets the address to XXX0101

Example 2 :TRIGger:BUS:B1:I2C:ADDRes:VALue?
XXX0101

:TRIGger:BUS:B1:I2C:ADDRes:DIRectioN  

Description Sets or queries the address bit as read write or don't care.

Note This setting only applies when the I²C trigger is set to trigger on Address or Address/Data

Syntax :TRIGger:BUS:B1:I2C:ADDRes:DIRectioN { READ | WRITE | NOCARE | ? }

Related commands :TRIGger:BUS:B1:I2C:CONDition

Parameter	READ	Set read as the data direction.
	WRITE	Set write as the data direction.
	NOCARE	Set either as the data direction.

Return Parameter Returns the direction (READ, WRITE, NOCARE).

Example :TRIGger:BUS:B1:I2C:ADDRes:DIRectioN READ
Sets the direction to READ.

:TRIGger:BUS:B1:I2C:DATA:SIZE (Set) →
← (Query)

Description Sets or queries the data size in bytes for the I²C bus.

Note This setting only applies when the I²C trigger is set to trigger on Data or Address/Data

Syntax :TRIGger:BUS:B1:I2C:DATA:SIZE {<NR1> | ? }

Related commands :TRIGger:BUS:B1:I2C:CONDition

Parameter	<NR1>	Number of data bytes (1 to 5).
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Return parameter	<NR1>	Returns the number of bytes.
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Example :TRIGger:BUS:B1:I2C:DATA:SIZE 3
Sets the number of bytes to 3.

:TRIGger:BUS:B1:I2C:DATA:VALue (Set) →
← (Query)

Description Sets or queries the triggering data value for the I²C bus when the I²C bus is set to trigger on Data or Address/Data.

Syntax :TRIGger:BUS:B1:I2C:DATA:VALue {string | ? }

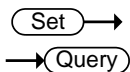
Related commands :TRIGger:BUS:B1:I2C:DATA:SIZE

Parameter	<sting>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0
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Return Parameter Returns the data value.

Example1 :TRIGger:BUS:B1:I2C:DATA:SIZE 1
:TRIGger:BUS:B1:I2C:DATA:VALue "1x1x0101"
Sets the value to XXX0101

Example 2 :TRIGger:BUS:B1:I2C:DATA:VALue?
1X1X0101



:TRIGger:BUS:B1:UART:CONDition

Description Sets or queries the UART triggering condition.

Syntax :TRIGger:BUS:B1:UART:CONDition { RXSTArt | RXDATA | RXENDPacket | TXSTArt | TXDATA | TXENDPacket | TXPARItYerr | RXPARItyerr | ? }

Parameter	RXSTArt	Set trigger on the RX Start Bit.
	RXDATA	Set trigger on RX Data.
	RXENDPacket	Set trigger on the RX End of Packet condition.
	RXPARItyerr	Set trigger on RX Parity error condition.
	TXSTArt	Set trigger on the TX Start Bit.
	TXDATA	Set trigger on TX Data.
	TXENDPacket	Set trigger on the TX End of Packet condition.
	TXPARItYerr	Set trigger on TX Parity error condition.

Return Parameter Returns the triggering condition.

Example :TRIGger:BUS:B1:UART:CONDition TXDATA
Sets the UART bus to trigger on Tx Data.

:TRIGger:BUS:B1:UART:RX:DATA:SIZE (Set) →
→ (Query)

Description Sets or queries the number of bytes for UART data.

Note This setting only applies when the UART trigger is set to trigger on Rx Data

Syntax :TRIGger:BUS:B1:UART:RX:DATA:SIZE {<NR1> | ?}

Related commands :TRIGger:BUS:B1:UART:CONDition

Parameter <NR1> Number of bytes (1 to 10).

Return parameter <NR1> Returns the number of bytes.

Example :TRIGger:BUS:B1:UART:RX:DATA:SIZE 5
Sets the number of bytes to 5.

:TRIGger:BUS:B1:UART:RX:DATA:VALue (Set) →
→ (Query)

Description Sets or queries the triggering data value for the UART bus when the bus is set to trigger on Rx Data.

Syntax :TRIGger:BUS:B1:UART:RX:DATA:VALue {string | ?}

Related commands :TRIGger:BUS:B1:UART:RX:DATA:SIZE

Parameter <string> The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string".

x = don't care

1 = binary 1

0 = binary 0

Return Parameter Returns the data value.

Example1 :TRIGger:BUS:B1:UART:CONDition RXDATA
 :TRIGger:BUS:B1:UART:RX:DATA:SIZE 1
 :TRIGger:BUS:B1:UART:RX:DATA:VALue "1x1x0101"
 Sets the value to 1x1x0101

Example 2 :TRIGger:BUS:B1:UART:RX:DATA:VALue?
 1X1X0101

:TRIGger:BUS:B1:UART:TX:DATA:SIZE  

Description Sets or queries the number of bytes for UART data.

Note This setting only applies when the UART trigger is set to trigger on Tx Data

Syntax :TRIGger:BUS:B1:UART:TX:DATA:SIZE {<NR1> | ?}

Related commands :TRIGger:BUS:B1:UART:CONDition

Parameter <NR1> Number of bytes (1 to 10).

Return parameter <NR1> Returns the number of bytes.

Example :TRIGger:BUS:B1:UART:TX:DATA:SIZE 5
 Sets the number of bytes to 5.

:TRIGger:BUS:B1:UART:TX:DATA:VALue  

Description Sets or queries the triggering data value for the UART bus when the bus is set to trigger on Tx Data.

Syntax :TRIGger:BUS:B1:UART:TX:DATA:VALue {string | ?}

Related commands :TRIGger:BUS:B1:UART:TX:DATA:SIZE

Parameter	<sting>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0
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Return Parameter Returns the data value.

Example1 :TRIGger:BUS:B1:UART:CONDition TXDATA
:TRIGger:BUS:B1:UART:TX:DATA:SIZE 1
:TRIGger:BUS:B1:UART:TX:DATA:VALue "1x1x0101"
Sets the value to 1x1x0101

Example 2 :TRIGger:BUS:B1:UART:TX:DATA:VALue?
1X1X0101

:TRIGger:BUS:B1:SPI:CONDition  

Description	Sets or queries the SPI triggering condition.	
Syntax	:TRIGger:BUS:B1:SPI:CONDition {SS MISO MOSI MISOMOSI ? }	
Parameter	SS	Set to trigger on the Slave Selection condition.
	MISO	Set to trigger on the Master-In Slave-Out condition.
	MOSI	Set to trigger on the Master-Out Slave-In condition.
	MISOMOSI	Set to trigger on the Master-In Slave-Out and Master-Out Slave-In conditions.

Return Parameter Returns the triggering condition.

Example :TRIGger:BUS:B1:SPI:CONDition MISO
Sets the SPI bus to trigger on MISO.

:TRIGger:BUS:B1:SPI:DATA:SIZE (Set) →
→ (Query)

Description	Sets or queries the number of words for SPI data.	
Note	This setting only applies when the SPI trigger is set to trigger on MISO, MOSI or MISO/MOSI	
Syntax	:TRIGger:BUS:B1:SPI:DATA:SIZE {<NR1> ?}	
Related commands	:TRIGger:BUS:B1:SPI:CONDition	
Parameter	<NR1>	Number of words (1 to 32).
Return parameter	<NR1>	Returns the number of words.
Example	:TRIGger:BUS:B1:SPI:DATA:SIZE 10 Sets the number of words to 10.	

:TRIGger:BUS:B1:SPI:DATA:MISO:VALue (Set) →
→ (Query)

Description	Sets or queries the triggering data value for the SPI bus when the bus is set to trigger on MISO or MISO/MOSI.	
Syntax	:TRIGger:BUS:B1:SPI:DATA:MISO:VALue {string ?}	
Related commands	:TRIGger:BUS:B1:SPI:DATA:SIZE	
Parameter	<string>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0
Return Parameter	Returns the data value.	

Example1 :TRIGger:BUS:B1:SPI:CONDition MISO
 :TRIGger:BUS:B1:SPI:DATA:SIZE 2
 :TRIGger:BUS:B1:SPI:DATA:MISO:VALue "1x1x0101"
 Sets the value to 1x1x0101

Example 2 :TRIGger:BUS:B1:SPI:DATA:MISO:VALue?
 1X1X0101

:TRIGger:BUS:B1:SPI:DATA:MOSI:VALue  

Description Sets or queries the triggering data value for the SPI bus when the bus is set to trigger on MOSI or MISO/MOSI.

Syntax :TRIGger:BUS:B1:SPI:DATA:MOSI:VALue {string | ? }

Related commands :TRIGger:BUS:B1:SPI:DATA:SIZE

Parameter	<string>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0
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Return Parameter Returns the data value.

Example1 :TRIGger:BUS:B1:SPI:CONDition MOSI
 :TRIGger:BUS:B1:SPI:DATA:SIZE 2
 :TRIGger:BUS:B1:SPI:DATA:MOSI:VALue "1x1x0101"
 Sets the value to 1x1x0101

Example2 :TRIGger:BUS:B1:SPI:DATA:MOSI:VALue?
 1X1X0101

:TRIGger:BUS:B1:PARAllel:VALue
 Set →
 Query

Description	Sets or queries the triggering data value for the Parallel bus.	
Syntax	:TRIGger:BUS:B1:PARAllel:VALue {string ? }	
Related commands	:BUS1:PARAllel:WIDth	
Parameter	<string>	<p>The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string".</p> <p>x = don't care 1 = binary 1 0 = binary 0</p>
Return Parameter	Returns the data value.	
Example1	<pre>:BUS1:PARAllel:WIDth 8 :TRIGger:BUS:B1:PARAllel:VALue "1x1x0101" Sets the value to 1x1x0101</pre>	
Example 2	<pre>:TRIGger:BUS:B1:PARAllel:VALue? 1X1X0101</pre>	

:TRIGger:LOGic:INPut:CLOCK:SOURce
 Set →
 Query

Description	Sets or queries which channel is used as the clock source.	
Note	When "NONE" is selected as the clock source the trigger will use the Pattern trigger type. (This is the equivalent of the Data trigger on the scope panel)	
Syntax	:TRIGger:LOGic:INPut:CLOCK:SOURce {NONE D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 ? }	

Related commands	:TRIGger:LOGic:INPut:CLOCK:SOURce :TRIGger:LOGic:INPut:CLOCK:EDGE	
Parameter/Return parameter	NONE	No clock source, Set to pattern (data) trigger.
	D0 to D15	Digital channels D0 to D15
Example1	:TRIGger:LOGic:INPut:CLOCK:SOURce D0 :TRIGger:LOGic:INPut:CLOCK:EDGE FALL	

:TRIGger:LOGic:PATtern → Query

Description	Returns the conditions that are used to generate a logic pattern trigger with respect to the defined input pattern and identifies the time at which the selected pattern may be true and still generate a trigger.
Syntax	:TRIGger:LOGic:PATtern?
Return parameter	Returns a string containing the conditions for a logic pattern trigger.
Example	:TRIGger:LOGic:PATtern? :TRIGGER:LOGIC:PATTERN:INPUT:D0 X;D1 X;D2 X;D3 X;D4 X;D5 X;D6 X;D7 X;D8 X;D9 X;D10 X;D11 X;D12 X;D13 X;D14 X;D15 X;:TRIGGER:LOGIC:PATTERN:WHEN TRUE; :TRIGGER:LOGIC:PATTERN:DELTA TIME 1.000e-08;

:TRIGger:LOGic:PATtern:INPut:D<X> Set →
→ Query

Description	Sets or queries the trigger logic for the selected digital input.
Syntax	:TRIGger:LOGic:PATtern:INPut:D<X> { HIGH LOW X ? }
Related commands	:TRIGger:LOGic:INPut:CLOCK:SOURce :TRIGger:LOGic:INPut:CLOCK:EDGE

Parameter	<X>	X is the digital channel number D(0~15)
	HIGH	Set to a high logic state
	LOW	Set to a low logic state
	X	Set to a "don't care" state.

Return parameter Returns the logic state of the selected channel (HIGH, LOW, X).

Example1 :TRIGger:LOGic:PATtern:INPut:D0?
X

:TRIGger:LOGic:PATtern:DELTatime  

Description Sets or returns the pattern trigger delta time value.

Syntax :TRIGger:LOGic:PATtern:DELTatime {<NR3> | ? }

Related commands :TRIGger:LOGic:PATtern:WHEn

Parameter/Return parameter	<NR3>	Pattern trigger delta time in seconds. (10nS to 10S)
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Example :TRIGger:LOGic:PATtern:DELTatime?
8.960e-05

:TRIGger:LOGic:PATtern:WHEn  

Description Sets or returns the pattern logic condition on which to trigger the oscilloscope.

Syntax :TRIGger:LOGic:PATtern:WHEn { TRUE | FALSE | LESSthan | THAN | Equal | UNEQual | ? }

Related commands :TRIGger:LOGic:PATtern:DELTatime

Parameter/Return parameter	TRUE	Set true mode.
	FALSE	Set false mode.

LESSTHAN	Set less than mode Is True < time period* *Set from :TRIGger:LOGic:PATtern:DELtetime
MORETHAN	Set less than mode Is True > time period* *Set from :TRIGger:LOGic:PATtern:DELtetime
EQUAL	Set less than mode Is True = time period* *Set from TRIGger:LOGic:PATtern:DELtetime
UNEQUAL	Set less than mode Is True ≠ time period* *Set from TRIGger:LOGic:PATtern:DELtetime

Example1 :TRIGger:LOGic:PATtern:WHEn FALSE
Set the logic to false.

Example2 :TRIGger:LOGic:PATtern:WHEn?
FALSE

:TRIGger:TIMEOut:WHEn (Set) →
→ (Query)

Description Sets or queries the timeout trigger condition.

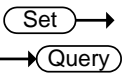
Syntax :TRIGger:TIMEOut:WHEn {HIGH|LOW|EITHer|?}

Related commands :TRIGger:TIMEOut:TIMER

Parameter	HIGH	Signal is high.
	LOW	Signal is low.
	EITHer	Signal is high or low.

Return parameter Returns the timeout condition (HIGH, LOW, EITHER).

Example1 :TRIGger:TIMEOut:WHEn LOW
 Sets the timeout condition to low.

:TRIGger:TIMEOut:TIMER 

Description Sets or returns timeout trigger time.

Syntax :TRIGger:TIMEOut:TIMER {value | ? }

Related commands :TRIGger:TIMEOut:WHEn

Parameter/Return parameter <value> <NR3> Timeout time. (10nS to 10S).

Example :TRIGger:TIMEOut:TIMER?
 8.960e-05

System Commands

:SYSTem:LOCK	146
:SYSTem:ERRor	146

:SYSTem:LOCK



Description	Turns the panel lock on off.	
Syntax	:SYSTem:LOCK {OFF ON ? }	
Parameter	OFF	System lock off
	ON	System lock on
Return parameter	Returns the status of the panel lock (ON, OFF).	
Example	:SYSTem:LOCK ON Turns the panel lock on.	

:SYSTem:ERRor

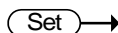


Description	Queries the error queue. See the appendix on page 208 for details.	
Syntax	:SYSTem:ERRor?	
Return parameter	Returns the last message in the error queue.	
Example	:SYSTem:ERRor? +0, "No error."	

Save/Recall Commands

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:RECALL:SETUp



Description	Recalls setup settings from memory or USB.	
Syntax	:RECALL:SETUp {S1~S20 <file path>("Disk:/xxx.SET", "USB:/xxx.SET")}	
Parameter	S1~S20	Recall Set1~Set20
	<file path>	Recall a file from the DSO internal files system or from a USB flash drive.
Example	:RECALL:SETUp S1 Recalls setup setting S1 from memory. :RECALL:SETUp "Disk:/DS0001.SET" Recall setup setting DS0001.SET from system internal disk.	

:RECALL:WAVEform



Description	Recalls a waveform from wave1~wave20 or from file to REF1~4.	
Note	Only *.LSF files can be recalled using this command. *.CSV files cannot be recalled.	
Syntax	:RECALL:WAVEform{W<n> <file path> ("Disk:/xxx.LSF", "USB:/xxx.LSF")}, REF<X>	
Parameter	n	1~20 (Wave1~wave20)
	xxx.LSF	Filename in file path.
	<X>	1,2,3,4 (REF1, REF2, REF3, REF4)
Example	:RECALL:WAVEform W1, REF1 Recalls the waveform stored in Wave1 to reference 1.	

:SAVE:IMAGe



Description	Saves a screen image to the assigned file path with a specified filename.	
Syntax	:SAVE:IMAGe {<file path> ("Disk:/xxx.PNG", "USB:/xxx.BMP")}	
Related commands	:SAVE:IMAGe:FILEFormat :SAVE:IMAGe:INKSaver	
Parameter	xxx.PNG or xxx.BMP	File name (8 characters max)
Example	:SAVE:IMAGe "Disk:/pic1.PNG" Saves a screen image named pic1.png to the root directory (Disk:/) of the scope. :SAVE:IMAGe "USB:/pic1.BMP" Saves a screen image named pic1.bmp to the root directory of the external USB flash disk.	

:SAVe:IMAGe:FILEFormat (Set) →
→ (Query)

Description	Sets the file format for image.	
Syntax	:SAVe:IMAGe:FILEFormat {PNG BMP ?}	
Related commands	:SAVe:IMAGe :SAVe:IMAGe:INKSaver	
Parameter	PNG	Sets the file format to PNG
	BMP	Sets the file format to BMP
Return parameter	Returns the file format (PNG, BMP).	
Example	:SAVe:IMAGe:FILEFormat PNG Sets the image file format to PNG.	

:SAVe:IMAGe:INKSaver (Set) →
→ (Query)

Description	Turns Ink Saver on or off.	
Syntax	:SAVe:IMAGe:INKSaver {OFF ON ?}	
Related commands	:SAVe:IMAGe :SAVe:IMAGe:FILEFormat	
Parameter	OFF	Turns Inksaver off.
	ON	Turns Inksaver on.
Return parameter	Returns Ink Saver status (ON, OFF).	
Example	:SAVe:IMAGe:INKSaver ON Turns Ink Saver on.	

:SAVe:SETUp (Set) →

Description	Saves the current setup to internal memory (Set1~Set20) or the designated file path.	
Syntax	:SAVe:SETUp {<file path> ("Disk:/xxx.SET", "USB:/xxx.SET) S1~S20}	

Parameter	S1~S20	Saves the setup to Set1~Set20
	File path	Saves the setup to disk to the specified file path.

Example :SAVE:SETUp S1
 Saves the current setup to Set1 in internal memory.
 :SAVE:SETUp "Disk:/DS0001.SET"
 Saves the current setup to DS0001.SET in the external USB flash disk.

:SAVE:WAVEform



Description Saves a waveform to internal memory or to a designated file path.

Related commands :SAVE:WAVEform:FILEFormat

Syntax :SAVE:WAVEform {CH1~REF4, REF<X> } | {CH1~REF4, W1~W20} | {CH1~ALL, file path}

Parameter	CH1~REF4,	CH1~CH4, Math, REF1~4
	<X>	1,2,3,4 (REF1, REF2, REF3, REF4)
	W1~W20	Wave1~Wave20
	ALL	All the displayed waveforms on screen.
	File path	Saves the waveform(s) to disk or USB to the specified file path.

Example 1 :SAVE:WAVEform CH1, REF2
 Saves the channel1 waveform to REF2.

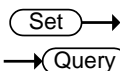
Example 2 :SAVE:WAVEform:FILEFormat LSF
 :SAVE:WAVEform ALL, "Disk:/ALL001"
 Sets the file format to LSF. A folder named "ALL001" is created and saves all displayed waveforms to the "ALL001" directory in the LSF format.

Example 3 :SAVe:WAVEform:FILEFormat FCSV
 :SAVe:WAVEform ALL, "Disk:/ALL002"
 Sets the file format to FCSV(fast CSV format). It then saves the all channel's waveforms to the root directory (Disk:/) of the internal flash disk in the CSV format (with the filename ALL002.CSV).

Example 4 :SAVe:WAVEform:FILEFormat LSF
 :SAVe:WAVEform CH2, "Disk:/DS0003.LSF"
 Save the channel 2's waveform to the root directory (Disk:/) of the internal flash disk in the LSF format with DS0003.LSF as the filename.

Note: Only LSF file format can be recalled by scope using remote commands.

:SAVe:WAVEform:FILEFormat



Description	Sets the waveform savefile format.	
Syntax	:SAVe:WAVEform:FILEFormat {LSF DCSV FCSV LMDCSV LMFCSV ?}	
Parameter	LSF	Sets the file format to the GDS 2000A's internal file format, LSF. (xxx.LSF) (no support LA)
	DCSV	Sets the file format to detail CSV. (xxx.CSV)
	FCSV	Sets the file format to fast CSV. (xxx.CSV)
	LMDCSV	Sets the file format to LM detail CSV. (xxx.CSV)
	LMFCSV	Sets the file format to LM fast CSV. (xxx.CSV)
Return parameter	Returns the file format (LSF , DCSV, FCSV , LMDCSV,LMFCSV).	

Example :SAVe:WAVEform:FILEFormat LSF
 Sets the file format to LSF.

Ethernet Commands

:ETHERnet:DHCP153

:ETHERnet:DHCP

Set →

→ Query

Description	Sets or queries the DHCP settings.	
Syntax	:ETHERnet:DHCP { OFF ON ? }	
Parameter	ON	Turns DHCP on.
	OFF	Turns DHCP off.
Example	:ETHERnet:DHCP ON Turns DHCP on.	

Time Commands

:DATE154

:DATE



Description	Sets the system date and time.	
Syntax	:DATE {string}	
Parameter	{string}	"YYYYMMDDhhmmss" Where: YYYY: year MM: month DD: day hh: hour mm: minute ss: second

Example :date "20101202142830"
 Sets the time and date as:
 Year: 2010, Month: 12, Day: 02, Hour: 14 (2PM),
 Minute: 28, Second: 30.

Bus Decode Commands

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:BUS1

→ Query

Description Returns the supported BUS types.

Syntax :BUS1?

Return Parameter Returns the supported bus types.

Example BUS1?
 I2C,SPI,UART,Parallel

Set →

→ Query

:BUS1:STATE

Description Sets or queries the state of the bus.

Syntax :BUS1:STATE { OFF | ON | ? }

Related commands :BUS1:TYPE

Parameter/Return parameter	OFF	Turns the bus off.
	ON	Turns the bus on.

Example :BUS1:STATE ON
 Turns the bus on.

Set →

→ Query

:BUS1:TYPE

Description Sets or queries the type of bus.

Syntax :BUS1:TYPE { UART | I2C | SPI | PARallel | ? }

Related commands :BUS1:STATE

Parameter/Return parameter	UART	Sets the bus to UART mode.
	I2C	Sets the bus to I ² C mode.
	SPI	Sets the bus to SPI mode.
	PARallel	Sets the bus to parallel mode.

Example :BUS1:TYPE SPI
 Sets the bus to SPI mode.

:BUS1:I2C:ADDRess:RWINClude



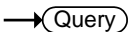

Description	Sets or queries whether the read/write bit is included in the I ² C address.	
Syntax	:BUS1:I2C:ADDRess:RWINClude { OFF ON ? }	
Related commands	:BUS1:STATE	
Parameter	OFF	The R/W is not included.
	ON	The R/W is included.
Return parameter	0	The R/W is not included.
	1	The R/W is included.
Example	:BUS1:I2C:ADDRess:RWINClude ON Includes the R/W bit in the I ² C address.	

:BUS1:I2C:SCLK:SOURce




Description	Sets or queries which channel is used for the I ² C SCLK source.	
Syntax	:BUS1:I2C:SCLK:SOURce { D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 ? }	
Parameter/Return parameter	D0 to D15	Digital channels D0 to D15
Example	:BUS1:I2C:SCLK:SOURce D0 Sets channel D0 as the SCLK source.	

:BUS1:I2C:SDA:SOURce

Description	Sets or queries which channel is used for the I ² C SDA source.	
-------------	--	--

Syntax :BUS1:I2C:SDA:SOURce { D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | ? }

Parameter/Return parameter D0 to D15 Digital channels D0 to D15

Example :BUS1:I2C:SDA:SOURce D1
Sets channel D1 as the SDA source.

Set →

← Query

:BUS1:UART:BITRate

Description Sets or queries the UART bit rate.

Syntax :BUS1:UART:BITRate { <NR1> | ? }

Parameter/Return parameter	<NR1>			
	UART bit rate (0~31)			
	<NR1>	Rate (bps)	<NR1>	Rate (bps)
	0	50	16	15200
	1	75	17	19200
	2	110	18	28800
	3	134	19	31250
	4	150	20	38400
	5	300	21	56000
	6	600	22	57600
	7	1200	23	76800
	8	1800	24	115200
	9	2000	25	128000
	10	2400	26	230400
	11	3600	27	460800
	12	4800	28	921600
	13	7200	29	1382400
	14	9600	30	1843200
	15	14400	31	2764800

Example :BUS1:UART:BITRate 10
Sets the bit rate to 2400.

:BUS1:UART:PARItY

Set →

→ Query

Description Sets or queries the UART bus parity.

Syntax :BUS1:UART:PARItY { <NR1> | ? }

Parameter/Return parameter	<NR1>	0: None 1: Odd parity 2: Even parity
----------------------------	-------	--

Example :BUS1:UART:PARItY 1
Sets the parity to odd.

Set →

→ Query

Description Sets or queries the UART packet setting.

Syntax :BUS1:UART:PACKEt {<NR1> | ? }

Parameter/Return parameter	<NR1>	0: Off 1: On
----------------------------	-------	-----------------

Example :BUS1:UART:PACKEt 1
Turns UART packets on.

Set →

→ Query

:BUS1:UART:EOFPAcket

Description Sets or queries the EOF character for the UART packet setting.

Syntax :BUS1:UART:EOFPAcket <NR1>

Parameter/Return parameter	<NR1>	0: NULL 1: LF (line feed) 2: CR (carriage return) 3: SP (space character) 4: FF
----------------------------	-------	---

Example :BUS1:UART:EOFPAcket 2
Sets the OEF character to CR.

Set →

:BUS1:UART:TX:SOURce

→ Query

Description Sets or queries which channel is used for the UART Tx source.

Syntax :BUS1:UART:TX:SOURce { OFF | D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | ? }

Parameter/Return parameter	OFF	Off, no Tx source
	D0 to D15	Digital channels D0 to D15

Example :BUS1:UART:TX:SOURce D1
Sets channel D1 as the Tx source.

Set →

:BUS1:UART:RX:SOURce

→ Query

Description Sets or queries which channel is used for the UART Rx source.

Syntax :BUS1:UART:RX:SOURce { OFF | D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | ? }

Parameter/Return parameter	OFF	Off, no Rx source
	D0 to D15	Digital channels D0 to D15


Example :BUS1:UART:RX:SOURce D1
Sets channel D1 as the Rx source.

:BUS1:SPI:SCLK:POLARity



Description	Sets or queries the polarity of the SCLK line for the SPI bus.	
Syntax	:BUS1:SPI:SCLK:POLARity { FALL RISE ? }	
Parameter/Return parameter	FALL	Sets the polarity to falling edge.
	RISE	Sets the polarity to rising edge.
Example	:BUS1:SPI:SCLK:POLARity FALL Sets the polarity to falling edge.	

:BUS1:SPI:SS:POLARity



Description	Sets or queries the polarity of the SS line for the SPI bus.	
Syntax	:BUS1:SPI:SS:POLARity { LOW HIGH ? }	
Parameter/Return parameter	LOW	Active low polarity
	HIGH	Active high polarity
Example	:BUS1:SPI:SS:POLARity LOW Sets the SS line to active low.	

:BUS1:SPI:WORDSize



Description	Sets the number of bits per word for the SPI bus.	
Syntax	:BUS1:SPI:WORDSize {<NR1> ? }	
Parameter/Return parameter	<NR1>	Bits per word (4~32)
Example	:BUS1:SPI:WORDSize 4 Sets the word size to 4 bits per word.	

Set →
 → Query

:BUS1:SPI:BITORder

Description	Sets or queries the bit order for the SPI bus.	
Syntax	:BUS1:SPI:BITORder {<NR1> ? }	
Parameter/Return parameter	<NR1>	0: MSB bit first 1: LSB bit first
Example	:BUS1:SPI:BITORder? 0 The bit order is currently set as MSB bit first.	

Set →
 → Query

:BUS1:SPI:SCLK:SOURce

Description	Sets or queries which channel is used for the SPI SCLK source.	
Syntax	:BUS1:SPI:SCLK:SOURce { D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 ? }	
Parameter/Return parameter	D0 to D15	Digital channels D0 to D15
Example	:BUS1:SPI:SCLK:SOURce D1 Sets channel D1 as the SPI SCLK source.	

Set →
 → Query

:BUS1:SPI:SS:SOURce

Description	Sets or queries which channel is used for the SPI SS source.	
Syntax	:BUS1:SPI:SS:SOURce { D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 ? }	
Parameter/Return parameter	D0 to D15	Digital channels D0 to D15

Example :BUS1:SPI:SS:SOURce D0
Sets channel D0 as the SPI SS source.

:BUS1:SPI:MOSI:SOURce (Set) →
→ (Query)

Description Sets or queries which channel is used for the SPI MOSI source.

Syntax :BUS1:SPI:MOSI:SOURce { OFF | D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | ? }

Parameter/Return parameter	D0 to D15	Digital channels D0 to D15
	OFF	No MOSI source.

Example :BUS1:SPI:MOSI:SOURce D2
Sets channel D2 as the SPI MOSI source.

:BUS1:SPI:MISO:SOURce (Set) →
→ (Query)

Description Sets or queries which channel is used for the SPI MISO source.

Syntax :BUS1:SPI:MISO:SOURce { OFF | D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | ? }

Parameter/Return parameter	D0 to D15	Digital channels D0 to D15
	OFF	No MISO source.

Example :BUS1:SPI:MISO:SOURce D3
Sets channel D3 as the SPI MISO source.

:BUS1:PARAllel:BIT<X>:SOURce (Set) →
→ (Query)

Description Sets or queries which channels are assigned to what bits for the parallel bus.

Syntax :BUS1:PARAllel:BIT<X>:SOURce{ D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | ? }

Parameter/Return parameter	<X>	Bit number: 0~15
	D0 to D15	Digital channels D0 to D15

Example :BUS1:PARAllel:BIT0:SOURce D0
 Assigns D0 to bit 0.

:BUS1:PARAllel:CLOCK:EDGE (Set) →
→ (Query)

Description Sets or queries the clock edge configuration for the parallel bus.

Syntax :BUS1:PARAllel:CLOCK:EDGE { RISE | FALL | EITHER | OFF | ? }

Parameter/Return parameter	FALL	Sets the clock edge to falling edge.
	RISe	Sets the clock edge to rising edge.
	EITHer	Sets the clock edge to rising or falling.
	OFF	Disables the clock edge setting.

Example :BUS1:PARAllel:CLOCK:EDGE FALL
 Sets the clock edge to falling edge.

:BUS1:PARAllel:CLOCK:SOURce (Set) →
→ (Query)

Description Sets or queries which channels are assigned as the clock source.

Syntax :BUS1:PARAllel:CLOCK:SOURce { D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | ? }


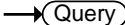
Parameter/Return parameter	D0 to D15	Digital channels D0 to D15
----------------------------	-----------	----------------------------

Example :BUS1:PARAllel:CLOCK:SOURce D0
 Assigns D0 as the clock source.

:BUS1:PARAllel:WIDth



Description	Sets or queries the number of bits for the parallel bus.	
Syntax	:BUS1:PARAllel:WIDth {<NR1> ? }	
Parameter/Return parameter	<NR1>	1~16
Example	:BUS1:PARAllel:WIDth 16 Sets the width of the bus to 16 bits.	

:BUS1:DISPlay:FORMAt



Description	Sets or queries the display format for the bus, either binary or hexadecimal.	
Syntax	:BUS1:DISPlay:FORMAt { BINary HEXadecimal ? }	
Parameter/Return parameter	BINary HEXadecimal	Binary format Hexadecimal format
Example	: BUS1:DISPlay:FORMAt BINary Sets the display format to binary.	

Mark Commands

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:MARK (Set) →

Description	Move to next or previous event mark.	
Syntax	:MARK { NEXT PREVIOUS }	
Related commands	:MARK:CREATE :MARK:DELEte	
Parameter	NEXT	Move to next mark
	PREVIOUS	Move to previous mark
Example	:MARK NEXT Moves to the next event mark.	

:MARK:CREATE (Set) →

Description	Creates a mark on the waveform at the current position or creates a mark for all the events for the current waveform.	
Syntax	:MARK:CREATE { CURRENT ALL }	
Related commands	:MARK :MARK:DELEte	
Parameter	CURRENT	Creates a mark at the current position
	ALL	Creates a mark for all the events.
Example	:MARK:CREATE CURRENT Creates a mark at the current position.	

:MARK:DELEte

Description	Deletes the current mark or all the marks on a waveform.
-------------	--

Syntax	:MARK:DELEte { CURRent ALL }
--------	--------------------------------

Related commands	:MARK :MARK:CREATE
------------------	-----------------------

Parameter	CURRent	Deletes the current mark
	ALL	Deletes all the marks.

Example	:MARK:DELEte CURRent Deletes the current mark.
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Search Commands

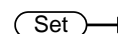
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:SEARCH:COPY



Description	Copies the search settings to the trigger settings or copies the trigger settings to the search settings.	
Syntax	:SEARCH:COPY {SEARCHtotrigger TRIGgertosearch}	
Parameter	SEARCHtotrigger	Copy the search setting to the trigger settings.
	TRIGgertosearch	Copy the trigger settings to the search settings.
Example	:SEARCH:COPY SEARCHtotrigger Copies the search settings to the trigger settings.	



:SEARCH:STATE



Description	Sets or queries whether the Search function is on or off.	
Syntax	:SEARCH:STATE { OFF ON ? }	
Parameter/Return parameter	OFF	Turn the Search function on.
	ON	Turn the Search function off.
Example	:SEARCH:STATE ON Turn Search on.	

:SEARCH:TOTAL → Query

Description Returns the total number of events found from the search function.

Syntax :SEARCH:TOTAL?

Parameter <NR1> Number of events.

Example :SEARCH:TOTAL?
5

Set →

:SEARCH:TRIGger:TYPe → Query

Description Sets or queries the search trigger type.

Syntax :SEARCH:TRIGger:TYPe { EDGe | PULSEWidth | RUNT | RISEFall | LOGic | BUS | ? }

Parameter/Return parameter	EDGe	Edge trigger
	PULSEWidth	Pulse width trigger
	RUNT	Runt trigger
	RISEFall	Rise and Fall trigger
	LOGic	Logic trigger
	BUS	Bus trigger

Example :SEARCH:TRIGger:TYPe EDGe
Sets the search trigger to the edge type.

Set →

:SEARCH:TRIGger:SOURce → Query

Description Sets or queries the search trigger source.

Syntax :SEARCH:TRIGger:SOURce {CH1 | CH2 | CH3 | CH4 | D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | ? }

Parameter/Return parameter	CH1 to CH4	Channel 1 to Channel 4
	D0 to D15	Digital channels D0 to D15

Example :SEARCH:TRIGger:SOURce CH1
Sets the search trigger source as CH1.

:SEARCH:TRIGger:EDGE:SLOP 

Description	Sets or queries the search trigger slope.	
Syntax	:SEARCH:TRIGger:EDGE:SLOP { RISE FALL EITHER ? }	
Related commands	:SEARCH:TRIGger:TYPE	
Parameter	RISe	Rising slope
	FALL	Falling slope
	EITHer	Either rising or falling slope

Return parameter Returns the trigger slope.

Example :SEARCH:TRIGger:EDGE:SLOP FALL
Sets the search trigger slope to falling.

:SEARCH:TRIGger:LEVel 

Description	Sets or queries the search trigger level.	
Syntax	:SEARCH:TRIGger:LEVel {TTL ECL SETTO50 <NRf> ?}	
Related commands	:SEARCH:TRIGger:TYPE	
Parameter	<NRf>	Trigger level value
	TTL	Sets the search trigger level to TTL.
	ECL	Sets the search trigger level to ECL.
	SETTO50	Sets the search trigger level to the User level (50% by default).
Return parameter	<NR3>	Returns the trigger.

Example1 :SEARCH:TRIGger:LEVel TTL
Sets the search trigger level to TTL.

Example2 :SEARCH:TRIGger:LEVel 3.30E-1
Sets the search trigger level to 330mV/mA.

Set →
 → Query

:SEARCH:TRIGger:HLEVel

Description Sets or queries the high level search trigger.

Note Applicable for Rise and Fall/Pulse Runt search triggers.

Syntax :SEARCH:TRIGger:HLEVel {TTL | ECL | <NRf> | ?}

Related commands :SEARCH:TRIGger:TYPE

Parameter	<NRf>	High level value.
	TTL	Sets the high level search trigger to TTL.
	ECL	Sets the high level search trigger to ECL.

Return parameter <NR3> Returns the high level search trigger.

Example1 :SEARCH:TRIGger:HLEVel TTL
Sets the high level search trigger to TTL

Example2 :SEARCH:TRIGger:HLEVel 3.30E-1
Sets the high level search trigger to 330mV/mA.

Set →
 → Query

:SEARCH:TRIGger:LLEVel

Description Sets or queries the low level search trigger.

Note Applicable for Rise and Fall/Pulse Runt triggers.

Syntax :SEARCH:TRIGger:LLEVel {TTL | ECL | <NRf> | ?}

Related commands :SEARCH:TRIGger:TYPE

Parameter	<NRf>	Low level value.
	TTL	Sets the low trigger level to TTL.
	ECL	Sets the low trigger level to ECL.

Return parameter <NR3> Returns the low level.

Example :SEARCH:TRIGger:LLEVel TTL
Sets the low level search trigger to TTL.

Example :SEARCH:TRIGger:LLEVel -3.30E-3
Sets the low level search trigger to 330mV/mA.

:SEARCH:TRIGger:PULSEWidth:POLarity  

Description Sets or queries the pulse width search trigger polarity.

Syntax :SEARCH:TRIGger:PULSEWidth:POLarity {POSitive | NEGative | ?}

Related commands :SEARCH:TRIGger:TYPE

Parameter	POSitive	Positive polarity
	NEGative	Negative polarity

Return parameter Returns the pulse width polarity.

Example :SEARCH:TRIGger:PULSEWidth:POLarity POSitive
Sets the pulse width polarity to positive.

:SEARCH:TRIGger:RUNT:POLarity  

Description Sets or queries the Pulse Runt search trigger polarity.

Syntax :SEARCH:TRIGger:RUNT:POLarity {POSitive | NEGative | EITher | ?}

Related commands :SEARCH:TRIGger:TYPE

Parameter	POSitive	Positive polarity
	NEGative	Negative polarity
	EITHer	Positive or negative polarity

Return parameter Returns the pulse runt search trigger polarity.

Example :SEARCH:TRIGger:RUNT:POLarity POSitive
Sets the Pulse Runt search trigger polarity to positive.

:SEARCH:TRIGger:RISEFall:SLOP (Set) →
→ (Query)

Description Sets or queries the slope of the Rise and Fall search trigger.

Syntax :SEARCH:TRIGger:RISEFall:SLOP { RISE | FALL | EITHer | ? }

Related commands :SEARCH:TRIGger:TYPE

Parameter	RISe	Rising slope
	FALL	Falling slope
	EITHer	Either rising or falling slope

Return parameter Returns the rise & fall slope.

Example :SEARCH:TRIGger:RISEFall :SLOP RISe
Sets the Rise & Fall search trigger slope to rising.

:SEARCH:TRIGger:PULSe:WHEn (Set) →
→ (Query)

Description Sets or queries the pulse width search trigger conditions.

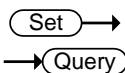
Syntax :SEARCH:TRIGger:PULSe:WHEn {THAN | LESSthan | EQual | UNEQual | ?}

Related commands :SEARCH:TRIGger:TYPE
:SEARCH:TRIGger:PULSe:TIME

Parameter	THAN	>
	LESSthan	<
	EQual	=
	UNEQual	≠

Return parameter Returns the pulse width search trigger conditions.

Example :SEARCH:TRIGger:PULSe:WHEn UNEQual
Sets the pulse width search trigger conditions to not equal to (≠).



:SEARCH:TRIGger:PULSe:TIME

Description Sets or queries the pulse width search trigger time.

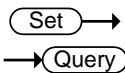
Syntax :SEARCH:TRIGger:PULSe:TIME {<NRf> | ?}

Related commands :SEARCH:TRIGger:TYPE
:SEARCH:TRIGger:PULSe:WHEn

Parameter <NRf> Pulse width time (4ns~10s)

Return parameter <NR3> Returns the pulse width time in seconds.

Example :SEARCH:TRIGger:PULSe:TIME 4.00E-5
Sets the pulse width search trigger to 40.0us.



:SEARCH:TRIGger:RUNT:WHEn

Description Sets or queries the pulse runt search trigger conditions.

Syntax :SEARCH:TRIGger:RUNT:WHEn {THAN | LESSthan | EQual | UNEQual | ?}

Related commands :SEARCH:TRIGger:TYPE
:SEARCH:TRIGger:RUNT:TIME

Parameter THAN >
LESSthan <

Equal	=
UNEQual	≠

Return parameter Returns the pulse runt search trigger conditions.

Example :SEARCH:TRIGger:RUNT:WHEn UNEQual
 Sets the pulse runt search trigger condition to unequal (≠).

Set →

→ Query

:SEARCH:TRIGger:RUNT:TIME

Description Sets or queries the pulse runt search trigger time.

Syntax :SEARCH:TRIGger:RUNT:TIME {<NRf> | ? }

Related commands :SEARCH:TRIGger:TYPE
 :SEARCH:TRIGger:RUNT:WHEn

Parameter <NRf> Pulse runt time (4nS to 10S)

Return Parameter <NR3> Returns the runt time in seconds.

Example :SEARCH:TRIGger:RUNT:TIME 4.00E-5
 Sets the pulse runt time to 40.0uS.

Set →

→ Query

:SEARCH:TRIGger:RISEFall:WHEn

Description Sets or queries the rise and fall search trigger conditions.

Syntax :SEARCH:TRIGger:RISEFall:WHEn {THAN | LESSthan | Equal | UNEQual | ? }

Related commands :SEARCH:TRIGger:TYPE
 :SEARCH:TRIGger:RISEFall:TIME

THAN	>
LESSthan	<
Equal	=
UNEQual	≠

Return parameter Returns the rise and fall search trigger condition.

Example :SEARCH:TRIGger:RISEFall:WHEn UNEQual
 Sets the rise andfall search trigger condition to unequal (≠).

:SEARCH:TRIGger:RISEFall:TIME (Set) →
 → (Query)

Description	Sets or queries the rise and fall time.	
Syntax	:SEARCH:TRIGger:RISEFall:TIME {<NRF> ? }	
Related commands	:SEARCH:TRIGger:TYPE :SEARCH:TRIGger:RISEFall:WHEn	
Parameter	<NRF>	Rise and Fall time (4nS to 10S)
Return Parameter	<NR3>	Returns the rise and fall time in seconds.

Example :SEARCH:TRIGger:RISEFall:TIME 4.00E-5
 Sets the trigger rise and fall time to 40.0us.

:SEARCH:TRIGger:LOGic:INPut:CLOCK:SO (Set) →
 → (Query)
 URce

Description	Sets or queries which channel is used as the clock source for the logic search trigger.	
Note	When “NONE” is selected as the clock source, the trigger will use the Pattern search trigger type.	
Syntax	:SEARCH:TRIGger:LOGic:INPut:CLOCK:SOURce {NONE D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 ? }	
Related commands	:SEARCH:TRIGger:LOGic:INPut:CLOCK:SOURce :SEARCH:TRIGger:LOGic:INPut:CLOCK:EDGE	
Parameter/Return parameter	NONE	No clock source, Set to Pattern search trigger.
	D0 to D15	Digital channels D0 to D15

Example1 :SEARCH:TRIGger:LOGic:INPut:CLOCK:SOURce D0
:SEARCH:TRIGger:LOGic:INPut:CLOCK:EDGE FALL

:SEARCH:TRIGger:LOGic:PATtern →(Query)

Description Returns the conditions that are used to generate a logic pattern search trigger with respect to the defined input pattern and identifies the time at which the selected pattern may be true and still generate a search trigger.

Syntax :SEARCH:TRIGger:LOGic:PATtern?

Return parameter Returns a string containing the conditions for a logic pattern search trigger.

Example :SEARCH:TRIGger:LOGic:PATtern?
:INPUT:D0 X;D1 X;D2 X;D3 X;D4 X;D5 X;D6 X;D7 X;D8 X;D9 X; D10 X;D11 X;D12 X;D13 X;D14 X;D15 X;:TRIGGER:LOGIC:PATTERN:WHEN TRUE; :TRIGGER:LOGIC:PATTERN:DELTA TIME 1.000e-08;

(Set) →

:SEARCH:TRIGger:LOGic:PATtern:INPut:D →(Query)


Description Sets or queries the search trigger logic for the selected digital input.

Syntax :SEARCH:TRIGger:LOGic:PATtern:INPut:D<X>
{ HIGH | LOW | X | ? }

Parameter	<X>	X is the digital channel number D(0~15)
	HIGH	Set to a high logic state
	LOW	Set to a low logic state
	X	Set to a "don't care" state.

Return parameter Returns the logic state of the selected channel (HIGH, LOW, X).

Example1 :SEARCH:TRIGger:LOGic:PATtern:INPut:D0?
X

:SEARCH:TRIGger:LOGic:PATtern:DELtati 
me 

Description Sets or returns the pattern search trigger delta time value.

Syntax :SEARCH:TRIGger:LOGic:PATtern:DELtati me {<NR3> | ? }

Related commands :SEARCH:TRIGger:LOGic:PATtern:WHEn

Parameter/Return parameter <NR3> Pattern search trigger delta time in seconds. (10nS to 10S)

Example :SEARCH:TRIGger:LOGic:PATtern:DELtati me 8.960e-05

:SEARCH:TRIGger:LOGic:PATtern:WHEn 


Description Sets or returns the pattern logic condition on which to trigger the search.

Syntax :SEARCH:TRIGger:LOGic:PATtern:WHEn { TRUE | FALSE | LESSthan | THAN | Equal | UNEQual | ? }

Related commands :SEARCH:TRIGger:LOGic:PATtern:DELtati me

Parameter/ Return parameter	TRUE	Set true mode.
	FALSE	Set false mode.
	LESSTHAN	Set less than mode Is True < time period* *Set from :SEARCH:TRIGger:LOGic:PATtern :DELtati me

MORETHAN	Set less than mode Is True > time period* *Set from :SEARCH:TRIGger:LOGic:PATtern :DELtetime
EQUAL	Set less than mode Is True = time period* *Set from :SEARCH:TRIGger:LOGic:PATtern :DELtetime
UNEQUAL	Set less than mode Is True ≠ time period* *Set from :SEARCH:TRIGger:LOGic:PATtern :DELtetime

Example1 :SEARCH:TRIGger:LOGic:PATtern:WHEn FALSE
Set the logic to false.

Example2 :SEARCH:TRIGger:LOGic:PATtern:WHEn?
FALSE

:SEARCH:TRIGger:BUS:TYPE → Query

Description Returns the current bus type.

Syntax :SEARCH:TRIGger:BUS:TYPE?

Return parameter	12C I2C mode
	SPI SPI mode
	UART UART mode
	PARALLEL Parallel mode

Example :SEARCH:TRIGger:BUS:TYPE?
UART

:SEARCH:TRIGger:BUS:B1:I2C:CONDition
 Set →
 Query

Description	Sets or queries the I ² C search trigger conditions.	
Syntax	:SEARCH:TRIGger:BUS:B1:I2C:CONDition {START STOP REPEATstart ACKMISS ADDRess DATA ADDRANDDATA ? }	
Parameter	START	Set Start as the I ² C search trigger condition.
	STOP	Set Stop as the I ² C search trigger condition.
	REPEATstart	Set Repeat of Start as the I ² C search trigger condition.
	ACKMISS	Set Missing Acknowledgement as the I ² C search trigger condition.
	ADDRess	Set Address as the I ² C search trigger condition.
	DATA	Set Data as the I ² C search trigger condition.
	ADDRANDDATA	Set Address and Data as the I ² C search trigger condition.
Return parameter	Returns the I ² C bus search trigger condition.	
Example	:SEARCH:TRIGger:BUS:B1:I2C:CONDition ADDRess Set Address as the I ² C search trigger condition.	

:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:MODE
 Set →
 Query

Description	Sets or queries the I ² C addressing mode (7 or 10 bits) for the search trigger.	
Syntax	:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:MODE {ADDR7 ADDR10 ? }	

Related commands :SEARCH:TRIGger:BUS:B1:I2C:CONDition

Parameter	ADDR7	7 bit addressing
	ADDR10	10 bit addressing

Return Parameter	0	7 bit addressing
	1	10 bit addressing

Example :SEARCH:TRIGger:BUS:B1:I2C:ADDRes:MODE? 0
 The addressing mode is current set to 7 bits.

:SEARCH:TRIGger:BUS:B1:I2C:ADDRes:TY Set →
 Pe Query

Description Sets the I²C bus address type, or queries what the setting is for the search trigger.



Syntax :SEARCH:TRIGger:BUS:B1:I2C:ADDRes:TYPe {GENeralcall | STARtbyte | HSmode | EEPROM | CBUS | ?}

Related commands :SEARCH:TRIGger:BUS:B1:I2C:CONDition

Parameter	GENeralcall	Set a general call address (0000 000 0).
	STARtbyte	Set a start byte address. (0000 000 1)
	HSmode	Set a high-speed mode address. (0000 1xx x)
	EEPROM	Set an EEPROM address. (1010 xxx x)
	CBUS	Set a CBUS address. (0000 001 x)

Return Parameter Returns the address type

Example :SEARCH:TRIGger:BUS:B1:I2C:ADDRes:TYPe? CBUS

:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:VALue  

Description Sets or queries the I²C bus address value when the I²C search trigger is set to trigger on Address or Address/Data.

Syntax :SEARCH:TRIGger:BUS:B1:I2C:ADDRess:VALue {string | ? }



Related commands :SEARCH:TRIGger:BUS:B1:I2C:ADDRess:MODE

Parameter < sting > 7/10 characters, must be enclosed in double quotes "string".
 x = don't care
 1 = binary 1
 0 = binary 0

Return Parameter Returns the address value in binary.

Example 1 :SEARCH:TRIGger:BUS:B1:I2C:ADDRess:MODE ADDR7
 :SEARCH:TRIGger:BUS:B1:I2C:ADDRess:VALue "xxx0101"
 Sets the address to XXX0101

Example 2 :SEARCH:TRIGger:BUS:B1:I2C:ADDRess:VALue? XXX0101

:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:DIRection  

Description Sets or queries the address bit as read write or don't care for the search function.

Note This setting only applies when the I²C search trigger is set to trigger on Address or Address/Data

Syntax	:SEARCH:TRIGger:BUS:B1:I2C:ADDRes:DIRection { READ WRITE NOCARE ? }	
Related commands	:SEARCH:TRIGger:BUS:B1:I2C:CONDition	
Parameter	READ	Set read as the data direction.
	WRITE	Set write as the data direction.
	NOCARE	Set either as the data direction.
Return Parameter	Returns the direction (READ, WRITE, NOCARE).	
Example	:SEARCH:TRIGger:BUS:B1:I2C:ADDRes:DIRection READ Sets the direction to READ.	

Set →

:SEARCH:TRIGger:BUS:B1:I2C:DATa:SIze ← Query

Description	Sets or queries the data size in bytes for the I ² C bus.	
Note	This setting only applies when the I ² C search trigger is set to trigger on Data or Address/Data	
Syntax	:SEARCH:TRIGger:BUS:B1:I2C:DATa:SIze {<NR1> ? }	
Related commands	:SEARCH:TRIGger:BUS:B1:I2C:CONDition	
Parameter	<NR1>	Number of data bytes (1 to 5).
Return parameter	<NR1>	Returns the number of bytes.
Example	:SEARCH:TRIGger:BUS:B1:I2C:DATa:SIze 3 Sets the number of bytes to 3.	

Set →

:SEARCH:TRIGger:BUS:B1:I2C:DATa:VALue ← Query

Description	Sets or queries the triggering data value for the I ² C bus when the I ² C search trigger is set to trigger on Data or Address/Data.	
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Syntax :SEARCH:TRIGger:BUS:B1:I2C:DATA:VALue {string | ? }


Related commands :SEARCH:TRIGger:BUS:B1:I2C:DATA:SIZE


Parameter	<code><string></code>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0
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Return Parameter Returns the data value.

Example1 :SEARCH:TRIGger:BUS:B1:I2C:DATA:SIZE 1
:SEARCH:TRIGger:BUS:B1:I2C:DATA:VALue "1x1x0101"
Sets the value to XXX0101

Example 2 :SEARCH:TRIGger:BUS:B1:I2C:DATA:VALue? 1X1X0101

:SEARCH:TRIGger:BUS:B1:UART:CONDitio n




Description Sets or queries the UART search triggering condition.



Syntax :SEARCH:TRIGger:BUS:B1:UART:CONDitio n { RXSTArt | RXDATA | RXENDPacket | TXSTArt | TXDATA | TXENDPacket | TXPARItYerr | RXPARItYerr | ? }

Parameter	RXSTArt	Set search trigger on the RX Start Bit.
	RXDATA	Set search trigger on RX Data.
	RXENDPacket	Set search trigger on the RX End of Packet condition.

RXPARIttyerr	Set search trigger on RX Parity error condition.
TXSTArt	Set search trigger on the TX Start Bit.
TXDATA	Set search trigger on TX Data.
TXENDPacket	Set search trigger on the TX End of Packet condition.
TXPARIttyerr	Set search trigger on TX Parity error condition.

Return Parameter Returns the search triggering condition.

Example :SEARCH:TRIGger:BUS:B1:UART:CONDition TXDATA
Sets the UART bus to trigger on Tx Data for the search function.

:SEARCH:TRIGger:BUS:B1:UART:RX:DATA: 
SIZE 

Description Sets or queries the number of bytes for UART data.

Note This setting only applies when the UART search trigger is set to trigger on Rx Data

Syntax :SEARCH:TRIGger:BUS:B1:UART:RX:DATA:SIZE {<NR1> | ?}

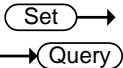
Related commands :SEARCH:TRIGger:BUS:B1:UART:CONDition

Parameter <NR1> Number of bytes (1 to 10).

Return parameter <NR1> Returns the number of bytes.

Example :SEARCH:TRIGger:BUS:B1:UART:RX:DATA:SIZE 5
Sets the number of bytes to 5.

Syntax	:SEARCH:TRIGger:BUS:B1:UART:TX:DATA:SIZE {<NR1> ?}	
Related commands	:SEARCH:TRIGger:BUS:B1:UART:CONDition	
Parameter	<NR1>	Number of bytes (1 to 10).
Return parameter	<NR1>	Returns the number of bytes.
Example	:SEARCH:TRIGger:BUS:B1:UART:TX:DATA:SIZE 5 Sets the number of bytes to 5.	

:SEARCH:TRIGger:BUS:B1:UART:TX:DATA: VALue 

Description	Sets or queries the search triggering data value for the UART bus when the bus is set to trigger on Tx Data.	
Syntax	:SEARCH:TRIGger:BUS:B1:UART:TX:DATA:VALue {string ? }	
Related commands	:SEARCH:TRIGger:BUS:B1:UART:TX:DATA:SIZE	
Parameter	<sting>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0
Return Parameter	Returns the data value.	
Example1	:SEARCH:TRIGger:BUS:B1:UART:CONDition TXDATA :SEARCH:TRIGger:BUS:B1:UART:TX:DATA:SIZE 1 :SEARCH:TRIGger:BUS:B1:UART:TX:DATA:VALue "1x1x0101" Sets the value to 1x1x0101	

Example 2 :SEARCH:TRIGger:BUS:B1:UART:TX:DATA:VALue?
1X1X0101

(Set) →

:SEARCH:TRIGger:BUS:B1:SPI:CONDition → (Query)

Description Sets or queries the SPI search triggering condition.

Syntax :SEARCH:TRIGger:BUS:B1:SPI:CONDition {SS | MISO
| MOSI | MISOMOSI | ? }

Parameter	SS	Set to trigger on the Slave Selection condition.
	MISO	Set to trigger on the Master-In Slave-Out condition.
	MOSI	Set to trigger on the Master-Out Slave-In condition.
	MISOMOSI	Set to trigger on the Master-In Slave-Out and Master-Out Slave-In conditions.

Return Parameter Returns the triggering condition.

Example :SEARCH:TRIGger:BUS:B1:SPI:CONDition MISO
Sets the SPI bus to trigger on MISO.

(Set) →

:SEARCH:TRIGger:BUS:B1:SPI:DATA:SIZE → (Query)

Description Sets or queries the number of words for SPI data for the search function.

Note This setting only applies when the SPI search trigger is set to trigger on MISO, MOSI or MISO/MOSI

Syntax :SEARCH:TRIGger:BUS:B1:SPI:DATA:SIZE {<NR1> | ?}

Related commands :SEARCH:TRIGger:BUS:B1:SPI:CONDition

Parameter <NR1> Number of words (1 to 32).

Return parameter <NR1> Returns the number of words.

Example :SEARCH:TRIGger:BUS:B1:SPI:DATA:SIZE 10
Sets the number of words to 10.

:SEARCH:TRIGger:BUS:B1:SPI:DATA:MISO: Set →
VALue → Query

Description Sets or queries the search triggering data value for the SPI bus when the bus is set to trigger on MISO or MISO/MOSI.

Syntax :SEARCH:TRIGger:BUS:B1:SPI:DATA:MISO:VALue {string | ? }



Related commands :SEARCH:TRIGger:BUS:B1:SPI:DATA:SIZE

Parameter	<sting>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0
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Return Parameter Returns the data value.

Example1 :SEARCH:TRIGger:BUS:B1:SPI:CONDition MISO
:SEARCH:TRIGger:BUS:B1:SPI:DATA:SIZE 2
:SEARCH:TRIGger:BUS:B1:SPI:DATA:MISO:VALue "1x1x0101"
Sets the value to 1x1x0101

Example 2 :SEARCH:TRIGger:BUS:B1:SPI:DATA:MISO:VALue?
1X1X0101

:SEARCH:TRIGger:BUS:B1:SPI:DATa:MOSI:  →
 VALue 

Description	Sets or queries the search triggering data value for the SPI bus when the bus is set to trigger on MOSI or MISO/MOSI.	
Syntax	:SEARCH:TRIGger:BUS:B1:SPI:DATa:MOSI:VALue {string ? }	
Related commands	:SEARCH:TRIGger:BUS:B1:SPI:DATa:SIZE	
Parameter	<sting>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes, "string". x = don't care 1 = binary 1 0 = binary 0

Return Parameter Returns the data value.

Example1 :SEARCH:TRIGger:BUS:B1:SPI:CONDition MOSI
 :SEARCH:TRIGger:BUS:B1:SPI:DATa:SIZE 2
 :SEARCH:TRIGger:BUS:B1:SPI:DATa:MOSI:VALue "1x1x0101"
 Sets the value to 1x1x0101

Example2 :SEARCH:TRIGger:BUS:B1:SPI:DATa:MOSI:VALue? 1X1X0101

:SEARCH:TRIGger:BUS:B1:PARAllel:VALue  → 

Description	Sets or queries the search triggering data value for the Parallel bus.	
Syntax	:SEARCH:TRIGger:BUS:B1:PARAllel:VALue {string ? }	

Related commands :BUS1:PARAllel:WIDth

Parameter	<code><string></code>	The number of characters in the string depends on the data size setting. The string must be enclosed in double quotes "string". x = don't care 1 = binary 1 0 = binary 0
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Return Parameter Returns the data value.

Example1 :BUS1:PARAllel:WIDth 8
 :SEARCH:TRIGger:BUS:B1:PARAllel:VALue "1x1x0101"
 Sets the value to 1x1x0101

Example 2 :SEARCH:TRIGger:BUS:B1:PARAllel:VALue?
 1X1X0101

Digital Commands

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:D<X>:DISPlay



Description	Turns the selected digital channel on or off or queries its status.	
Syntax	:D<X>:DISPlay { OFF ON ? }	
Parameter/ Return parameter	<X>	Digital channel number D(0 to 15).
	OFF	Turns the selected digital channel off.
	ON	Turns the selected digital channel on.
Example	:D0:DISPlay ON Turns D0 on.	

:D<X>:POSition



Description	Sets or returns the position of the selected digital channel.	
Syntax	:D<X>:POSition { <NRf> ? }	
Parameter	<X>	Digital channel number D(0 to 15).
	<NRf>	Position
Return parameter	<NR3>	Returns the position of the selected digital channel.
Example1	:D0:POSition? -1.87 DIV	
Example2	:D0:POSition 0 Sets the position to 0 DIV.	

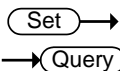
:DISPlay:DIGital:HEIght



Description	Sets or queries the height of the digital channel waveforms.	
Syntax	:DISPlay:DIGital:HEIght {SMALL MEDium LARge ?}	

Parameter/ Return parameter	SMALL	Sets the height to small mode.
	MEDium	Sets the height to medium mode.
	LARge	Sets the height to large mode. This mode is only available for ≤8 active channels.

Example :DISPlay:DIGital:HEIght?
LARGE



:DIGital:GROUP<X>:THREShold

Description	Sets or returns the threshold level for the selected group for a logic analyzer function.	
Syntax	:DIGital:GROUP<X>:THREShold { ECL TTL PECL CMOS5 CMOS3 CMOS2 <NR3> ? }	
Parameter	<X>	Selects the digital group: 1: D0~D3 2: D4~D7 3: D8~D11 4: D12~D15
	ECL	ECL high level of -1.3V.
	TTL	TTL high level of 1.4V.
	PECL	PECL high level of 3.7V.
	CMOS5	5.0V CMOS (high level of 2.5V).
	CMOS3	3.3V CMOS (high level of 1.65V).
	CMOS2	2.5V CMOS (high level of 1.25V).
	<NR3>	Set to a user defined threshold level.
	Return parameter	<NR3>

Example1 :DIGital:GROUP1:THREShold TTL
Sets the threshold to TTL levels.

Example2 :DIGital:GROUP1:THREShold?
1.400e+00

:DIGital:ANALog:A<X>:DISPlay



Description Turns the selected analog waveform on/off or returns its status.

Syntax :DIGital:ANALog:A<x>:DISPlay { OFF | ON | ? }

Parameter	<X>	Analog waveform 1 or 2.
	OFF	Turns the selected analog waveform off.
	ON	Turns the selected analog waveform on.

Return parameter Returns the status of the selected analog waveform (ON, OFF).

Example DIGital:ANALog:A1:DISPlay on
Turns on the A1 analog waveform.

:DIGital:ANALog:A<X>:RATio



Description Sets or returns the vertical scale of the selected analog waveform.

Syntax :DIGital:ANALog:A<X>:RATio {<NRf> | ? }

Parameter	<X>	Analog waveform 1 or 2.
	<NRf>	Ratio (0.1, 0.2, 0.3, 0.4.....1)

Return parameter <NR2> Returns the scale of the selected analog waveform.

Example1 :DIGital:ANALog:A1:RATio 0.1
Sets the analog waveform scale for A1 to 0.1.

:D<x>:MEMory 

Description Returns the data in acquisition memory for the selected digital channel as a header + raw data.

Syntax	D<X>:MEMory?
Related commands	ACQuire:RECOrdlength :HEADer
Parameter	<X> Digital channel D0 to D15
Return parameter	Returns the raw data + header information for the selected channel in the following format: Format,2.0A,Display,1,Memory Length,5000,IntpDistance,0,Trigger Address,2500,Threshold Used,1.400E+00,Source,D2,Vertical Units,V,Label2,;Firmware,V0.99.03,Horizontal Units,S,Horizontal Scale,5.000E-04,Horizontal Position,0.000E+00,Horizontal Mode,Main,SincET Mode,Real Time,Sampling Period,1.000E- 06,Time,25-Sep-12 16:13:41,Waveform Data;#510000<Raw Data> <LF>

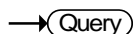
:D<x>:LMEMory → Query

Description	Returns the data in acquisition memory for the selected digital channel as a header + raw data.
Note	The data from this command is equivalent to the data that is saved in the LM Detail format using the scope panel controls.
Syntax	D<X>:LMEMory?
Related commands	ACQuire:RECOrdlength :HEADer
Parameter	<X> Digital channel D0 to D15

Return parameter Returns the raw data + header information for the selected channel in the following format:

```
Format,2.0A,Display,1,Memory
Length,1000000,IntpDistance,0,Trigger Address,-
563219,Threshold
Used,1.400E+00,Source,D2,Vertical
Units,V,Label2,;Firmware,V0.99.03,Horizontal
Units,S,Horizontal Scale,5.000E-04,Horizontal
Position,0.000E+00,Horizontal Mode,Main,SincET
Mode,Real Time,Sampling Period,5.000E-
09,Time,25-Sep-12 16:34:36,Waveform
Data;#72000000<Raw Data> <LF>
```

:DIGital:MEMory



Description Returns the data in acquisition memory for the digital channels as a header + raw data.

Syntax :DIGital:MEMory?

Related commands ACQuire:RECOrdlength
:HEADer

Return parameter Returns the raw data + header information for the digital channels in the following format:

```
Format,2.0A,Display,0000000000001100,Memory
Length,5000,IntpDistance,0,Trigger
Address,2500,Threshold12_15,1.400E+00,Threshol
d8_11,1.400E+00,Threshold4_7,1.400E+00,Threshol
d0_3,1.400E+00,Vertical
Units,V,Label15,;Label14,;Label13,;Label12,;Label1
1,;Label10,;Label9,;Label8,;Label7,;Label6,;Label5,;
Label4,;Label3,;Label2,;Label1,;Label0,;Firmware,V
0.99.03,Horizontal Units,S,Horizontal Scale,5.000E-
04,Horizontal Position,0.000E+00,Horizontal
Mode,Main,SincET Mode,Real Time,Sampling
Period,1.000E-06,Time,25-Sep-12
16:42:09,Waveform Data; #510000<Raw Data> <LF>
```

:DIGital:LMEMory



Description	Returns the data in acquisition memory for the digital channels as a header + raw data.
Note	The data from this command is equivalent to the data that is saved in the LM Detail format using the scope panel controls.
Syntax	:DIGital:LMEMory?
Related commands	ACQUire:RECOrdlength :HEADEr

Return parameter Returns the raw data + header information for the digital channels in the following format:

```
Format,2.0A,Display,0000000000001100,Memory
Length,1000000,IntpDistance,0,Trigger Address,-
544765,Threshold12_15,1.400E+00,Threshold8_11,1
.400E+00,Threshold4_7,1.400E+00,Threshold0_3,1.
400E+00,Vertical
Units,V,Label15,;Label14,;Label13,;Label12,;Label1
1,;Label10,;Label9,;Label8,;Label7,;Label6,;Label5,;
Label4,;Label3,;Label2,;Label1,;Label0,;Firmware,V
0.99.03,Horizontal Units,S,Horizontal Scale,5.000E-
04,Horizontal Position,0.000E+00,Horizontal
Mode,Main,SincET Mode,Real Time,Sampling
Period,5.000E-09,Time,25-Sep-12
16:52:08,Waveform Data;#72000000<Raw Data>
<LF>
```

Label Commands

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:CHANnel<X>:LABel




Description	Sets or returns the file label for the selected channel.	
Syntax	:CHANnel<X>:LABel {<string> ?}	
Related commands	:CHANnel<X>:LABel:DISPlay	
Parameter	<X>	Channel 1, ,2, 3, 4
	<string>	The string must be no more than 8 characters and only contain alphanumeric characters in addition to period, dash and underscore characters. The string must be enclosed in double quotes, "string".
Return parameter	<string>	Returns the label for the selected channel. No return indicates that there has not been a file label assigned for the selected channel.

Example1 :CHANnel1:LABel "CH1_lab"
 Sets the channel 1 label as "CH1_lab".

Example2 :CHANnel1:LABel?
 CH1_lab

:CHANnel<X>:LABel:DISPlay




Description Turns the label on/off for the selected channel or returns its status.

Syntax :CHANnel<X>:LABel:DISPlay { OFF | ON | ? }

Related commands :CHANnel<X>:LABel

Parameter	<X>	Channel 1, 2, 3, 4
	OFF	Turns the file label off for the selected channel.
	ON	Turns the file label on for the selected channel.

Return parameter Returns the status of the file label for the selected channel (ON, OFF).

Example :CHANnel1:LABel "CH1"
 :CHANnel1:LABel:DISPlay ON
 :CHANnel1:LABel:DISPlay?
 ON
 Sets the channel 1 label to "CH1" and then turns the label display on. The query return shows that the label is on.

:REF<X>:LABel




Description Sets or returns the file label for the selected reference waveform.

Syntax :REF<X>:LABel {<string> | ?}

Related commands :REF<X>:LABel:DISPlay

Parameter	<X>	REF 1, 2, 3, 4
	<string>	The string must be no more than 8 characters and only contain alphanumeric characters in addition to period, dash and underscore characters. The string must be enclosed in double quotes, "string".
Return parameter	<string>	Returns the label for the selected reference waveform. No return indicates that there has not been a file label assigned for the selected reference waveform.

Example1 :REF1:LABel "REF1_lab"
Sets the REF1 label as "REF1_lab".

Example2 :REF1:LABel?
REF1_lab



Description Turns the label on/off for the selected reference waveform or returns its status.

Syntax :REF<X>:LABel:DISPlay { OFF | ON | ? }

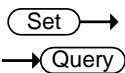
Related commands :REF<X>:LABel

Parameter	<X>	Reference waveform 1, 2, 3, 4
	OFF	Turns the file label off for the selected reference waveform.
	ON	Turns the file label on for the selected reference waveform.

Return parameter Returns the status of the file label for the selected reference waveform (ON, OFF).

Example :REF1:LABel "REF1"
 :REF1:LABel:DISPlay ON
 :REF1:LABel:DISPlay?
 ON

Sets the label for reference waveform 1 to "REF1" and then turns the label display on. The query return shows that the label is on.

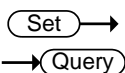


:BUS1:LABel

Description	Sets or returns the file label for the bus.	
Syntax	:BUS1:LABel {<string> ?}	
Related commands	:BUS1:LABel:DISPlay	
Parameter	<string>	The string must be no more than 8 characters and only contain alphanumeric characters in addition to period, dash and underscore characters. The string must be enclosed in double quotes, "string".
Return parameter	<string>	Returns the label for the bus. No return indicates that there has not been a file label assigned for bus.

Example1 :BUS1:LABel "Bus"
 Sets the bus label as "Bus".

Example2 :BUS1:LABel?
 Bus



:BUS1:LABel:DISPlay

Description	Turns the label on/off for the bus or returns its status.	
Syntax	:BUS1:LABel:DISPlay { OFF ON ? }	

Related commands	:BUS1:LABel	
Parameter	OFF	Turns the file label off for the bus.
	ON	Turns the file label on for the bus.
Return parameter	Returns the status of the file label for the bus (ON, OFF).	
Example	:BUS1:LABel "Bus"	
	:BUS1:LABel:DISPlay ON :BUS1:LABel:DISPlay? ON	
	Sets the label for the bus to "Bus" and then turns the label display on. The query return shows that the label is on.	



Description	Sets or returns the waveform label for the selected digital channel.	
Syntax	:D<X>:LABel {<string> ?}	
Related commands	:D<X>:LABel:DISPlay	
Parameter	<X>	Digital Channel D(0 to 15)
	<string>	The string must be no more than 8 characters and only contain alphanumeric characters in addition to period, dash and underscore characters. The string must be enclosed in double quotes, "string".
Return parameter	<string>	Returns the label for the selected digital channel. No return indicates that there has not been a file label assigned for the selected digital channel.

Example1 :D0:LABel "D0_lab"
Sets the D0 label as "D0_lab".

Example2 :D0:LABel?
D0_lab

:D<X>:LABel:DISPlay



Description Turns the label on/off for the selected digital channel or returns its status.

Syntax :D<X>:LABel:DISPlay { OFF | ON | ? }

Related commands :D<X>:LABel

Parameter	<X>	Digital channel D(0 to 15)
	OFF	Turns the file label off for the selected digital channel.
	ON	Turns the file label on for the selected digital channel.

Return parameter Returns the status of the label for the selected digital channel (ON, OFF).

Example :D1:LABel "D1"
:D1:LABel:DISPlay ON
:D1:LABel:DISPlay?
ON
Sets the D1 label to "D1" and then turns the label display on. The query return shows that the label is on.

:DIGital:ANALog:A<X>:LABel



Description Sets or returns the waveform label for the selected analog waveform (from Logic Analyzer function).

Syntax :DIGital:ANALog:A<X>:LABel {<string> | ?}

Related commands	:DIGital:ANALog:A<X>:LABel:DISPlay	
Parameter	<X>	Analog waveform A(1 or 2)
	<string>	The string must be no more than 8 characters and only contain alphanumeric characters in addition to period, dash and underscore characters. The string must be enclosed in double quotes, "string".
Return parameter	<string>	Returns the label for the selected analog waveform. No return indicates that there has not been a file label assigned for the selected analog waveform.

Example1 :DIGital:ANALog:A1:LABel "A1_lab"
 Sets the label for analog waveform 1 as "A1_lab".

Example2 :DIGital:ANALog:A1:LABel?
 A1_lab

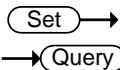


Description	Turns the label on/off for the selected analog waveform or returns its status.	
Syntax	:DIGital:ANALog:A<X>:LABel:DISPlay { OFF ON ? }	
Related commands	:DIGital:ANALog:A<X>:LABel	
Parameter	<X>	Analog waveform A(1 or 2)
	OFF	Turns the waveform label off for the selected analog waveform.
	ON	Turns the waveform label on for the selected analog waveform.

Return parameter Returns the status of the waveform label for the selected analog waveform (ON, OFF).

Example :DIGital:ANALog:A1:LABel "A1"
 :DIGital:ANALog:A1:LABel:DISPlay ON
 :DIGital:ANALog:A1:LABel:DISPlay?
 ON

Sets the label for analog waveform 1 to "A1" and then turns the label display on. The query return shows that the label is on.



:SET<X>:LABel

Description Sets or returns the file label for the selected setup.

Syntax :SET<X>:LABel {<string> | ?}

Related commands :SET<X>:LABel:DISPlay

Parameter	<X>	Setup number 1 to 20
	<string>	The string must be no more than 8 characters and only contain alphanumeric characters in addition to period, dash and underscore characters. The string must be enclosed in double quotes, "string".
Return parameter	<string>	Returns the label for the selected setup. No return indicates that there has not been a file label assigned for the selected setup.

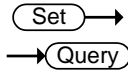
Example1 :SET1:LABel "SET1_lab"
 Sets the label for setup 1 as "SET1_lab".

Example2 :SET1:LABel?
 SET1_lab

Utility Commands

:BUZZER207

:BUZZER



Description Turns the buzzer on or off or queries its status.

Syntax :BUZZER { OFF | ON | ? }

Parameter/	OFF	Turns the buzzer off.
Return parameter	ON	Turns the buzzer on.

Example1 :BUZZER?
 OFF
 The buzzer is off.

APPENDIX

Error messages

Description The following error messages may be returned from the :SYSTem:ERRor? query. For details see page 146.

List of error messages	Error number, "Error Description"
	+0, "No error."
	-100, "Command error"
	-101, "Invalid character"
	-102, "Syntax error"
	-103, "Invalid separator"
	-104, "Data type error"
	-105, "GET not allowed"
	-108, "Parameter not allowed"
	-109, "Missing parameter"
	-110, "Command header error"
	-111, "Header separator error"
	-112, "Program mnemonic too long"
	-113, "Undefined header"
	-114, "Header suffix out of range"
	-115, "Unexpected number of parameters"
	-120, "Numeric data error"
	-121, "Invalid character in number"
	-123, "Exponent too large"
	-124, "Too many digits"
	-128, "Numeric data not allowed"
	-130, "Suffix error"
	-131, "Invalid suffix"
	-134, "Suffix too long"
	-138, "Suffix not allowed"

- 140, "Character data error"
- 141, "Invalid character data"
- 144, "Character data too long"
- 148, "Character data not allowed"
- 150, "String data error"
- 151, "Invalid string data"
- 158, "String data not allowed"
- 160, "Block data error"
- 161, "Invalid block data"
- 168, "Block data not allowed"
- 170, "Expression error"
- 171, "Invalid expression"
- 178, "Expression data not allowed"
- 180, "Macro error"
- 181, "Invalid outside macro definition"
- 183, "Invalid inside macro definition"
- 184, "Macro parameter error"

- 200, "Execution error"
- 201, "Invalid while in local"
- 202, "Settings lost due to rtl"
- 203, "Command protected"
- 210, "Trigger error"
- 211, "Trigger ignored"
- 212, "Arm ignored"
- 213, "Init ignored"
- 214, "Trigger deadlock"
- 215, "Arm deadlock"
- 220, "Parameter error"
- 221, "Settings conflict"
- 222, "Data out of range"
- 223, "Too much data"
- 224, "Illegal parameter value"
- 225, "Out of memory"
- 226, "Lists not same length"
- 230, "Data corrupt or stale"
- 231, "Data questionable"
- 232, "Invalid format"
- 233, "Invalid version"
- 240, "Hardware error"

- 241, "Hardware missing"
- 250, "Mass storage error"
- 251, "Missing mass storage"
- 252, "Missing media"
- 253, "Corrupt media"
- 254, "Media full"
- 255, "Directory full"
- 256, "File name not found"
- 257, "File name error"
- 258, "Media protected"
- 260, "Expression error"
- 261, "Math error in expression"
- 270, "Macro error"
- 271, "Macro syntax error"
- 272, "Macro execution error"
- 273, "Illegal macro label"
- 274, "Macro parameter error"
- 275, "Macro definition too long"
- 276, "Macro recursion error"
- 277, "Macro redefinition not allowed"
- 278, "Macro header not found"
- 280, "Program error"
- 281, "Cannot create program"
- 282, "Illegal program name"
- 283, "Illegal variable name"
- 284, "Program currently running"
- 285, "Program syntax error"
- 286, "Program runtime error"
- 290, "Memory use error"
- 291, "Out of memory"
- 292, "Referenced name does not exist"
- 293, "Referenced name already exists"
- 294, "Incompatible type"

- 300, "Device-specific error"
- 310, "System error"
- 311, "Memory error"
- 312, "PUD memory lost"
- 313, "Calibration memory lost"
- 314, "Save/recall memory lost"

- 315, "Configuration memory lost"
- 320, "Storage fault"
- 321, "Out of memory"
- 330, "Self-test failed"
- 340, "Calibration failed"
- 350, "Queue overflow"
- 360, "Communication error"
- 361, "Parity error in program message"
- 362, "Framing error in program message"
- 363, "Input buffer overrun"
- 365, "Time out error"

- 400, "Query error"
- 410, "Query INTERRUPTED"
- 420, "Query UNTERMINATED"
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