

Digital Storage Oscilloscope

GDS-2000A Series

PROGRAMMING MANUAL

GW INSTEK PART NO. Version 1.4, August 2013



ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

August 2013

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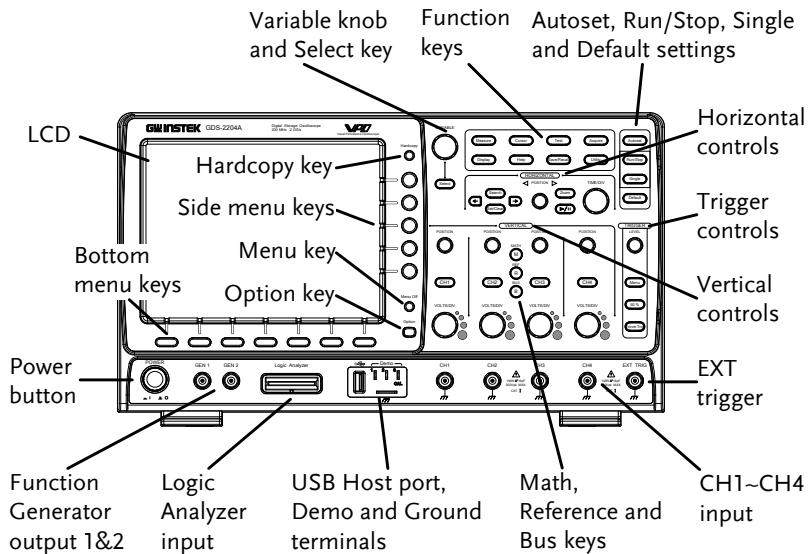
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INTERFACE OVERVIEW

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.

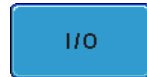
Configure RS-232C Interface

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

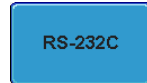
Panel Operation 1. Press the *Utility* key.



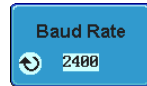
2. Press *I/O* from the bottom menu.



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

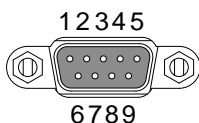
7. Press *Save Now* to save the settings.



8. Connect the RS-232C cable to the rear panel port: DB-9 male connector. For a functionality check, see page 14.



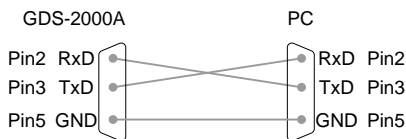
Pin Assignment



- 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 | Domain Name |
| Instrument Name | DNS IP Address |
| User Password | Gateway IP Address |
| Instrument 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 12.

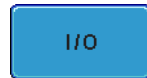
Panel Operation 1. Connect the Ethernet cable to the LAN port on the DS2-LAN module.



2. Press the *Utility* key.



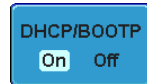
3. Press *I/O* from the bottom menu.



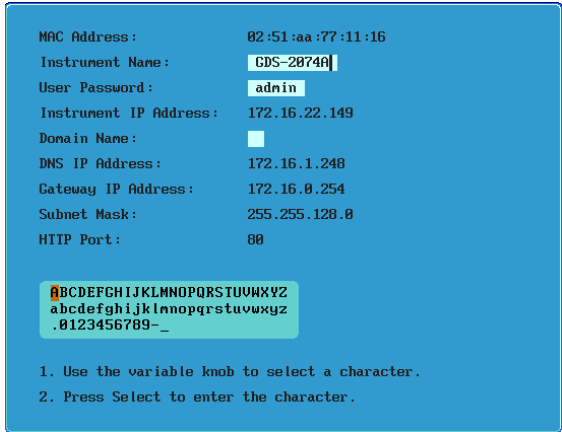
4. Press *Ethernet* from the side menu.



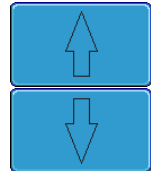
5. Set *DHCP/BOOTP* to *On* or *Off* from the side menu.



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



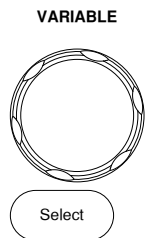
6. Use the *Up* and *Down* arrows on the side menu to navigate to each Ethernet configuration item.



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

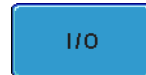
The GDS-2000A supports socket server functionality for direct two-way communication with a client PC or device over LAN. By default, the Sockets Server is off.

Configure Socket Server 1. Configure the IP address for the GDS-2000A. Page 8

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

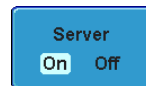
6. Press *Set Port* to confirm the port number.



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.



Utility

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



I/O

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.



GPIB Address



1

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

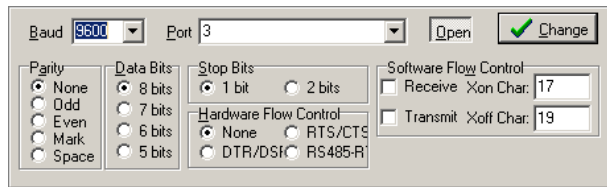
USB/RS-232C Functionality Check

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

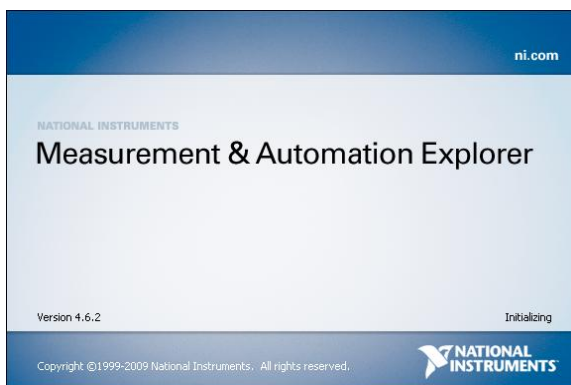
Socket Server Functionality Check

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:

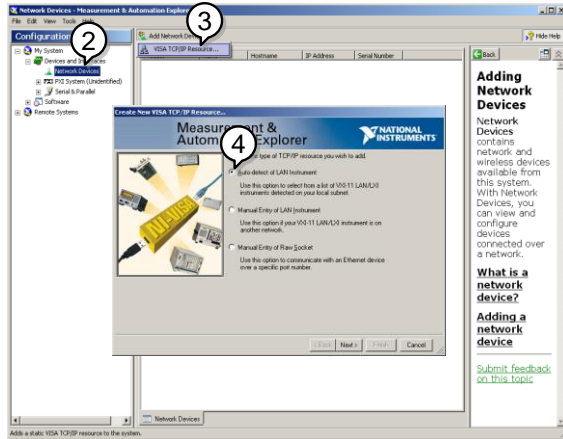


Start>All Programs>National Instruments>Measurement & Automation

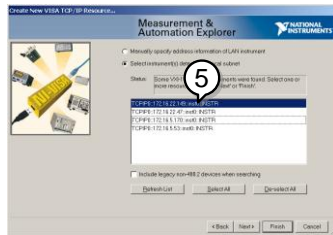


2. From the Configuration panel access;
My System>Devices and Interfaces>Network Devices
3. Press *Add New Network Device>Visa TCP/IP Resource...*

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.



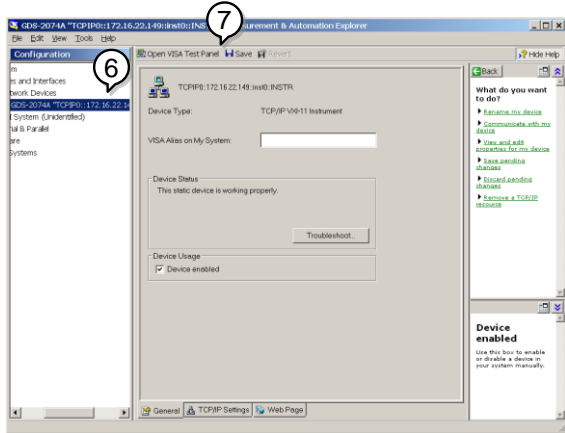
5. Select the IP address that corresponds to the GDS-2000A and click *N*ext.



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

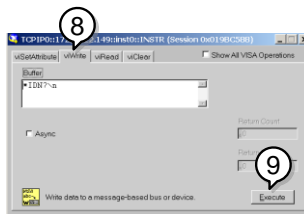
Functionality Check

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

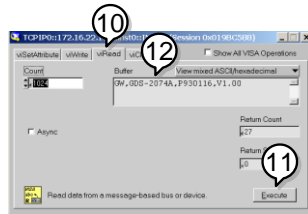


- Click on the *viWrite* tab. The **IDN?* query should already be in the buffer area.

- 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



GPIB Functionality Check

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

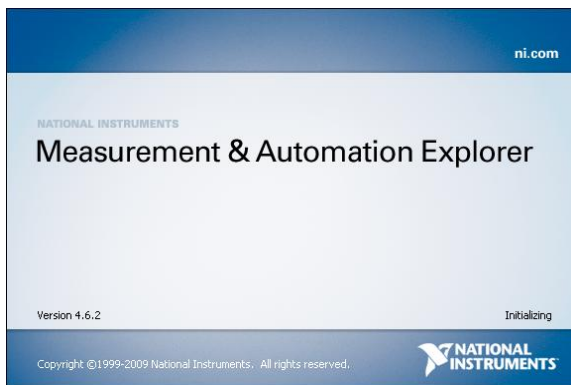
For further information about National Instruments, please see the NI website at www.ni.com.

Operation

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

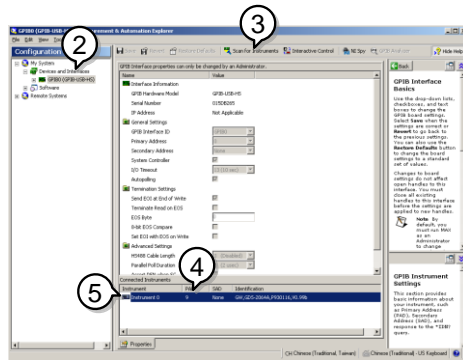


Start>All Programs>National Instruments>Measurement & Automation



2. From the Configuration panel access;
My System>Devices and Interfaces>GPIB0

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.



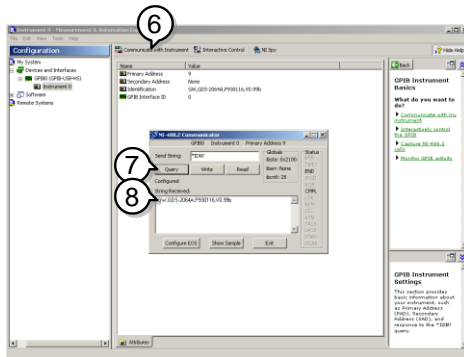
6. Click on *Communicate with Instrument*.
7. In the *NI-488.2 Communicator* window, ensure **IND?* is written in the *Send String:* text box.

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.

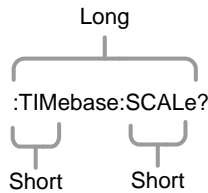
C **COMMAND OVERVIEW**

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 :TIMbase:SCALE <NR3>LF

1: command header
 2: single space
 3: parameter
 4: message terminator

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?	37
	*LRN?	37
	*SAV	39
	*RCL	40
	*RST	40
	*CLS	40
<hr/>		
Acquisition	:ACQuire:AVERAge	41
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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 page 24.

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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:EOfPACket 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 ;;D
 4:LABel ;;D5:LABel ;;D6:LABel ;;D7:LABel ;;D8:LABel ;;D9:LABel ;;D
 10:LABel ;;D11:LABel ;;D12:LABel ;;D13:LABel ;;D14:LABel ;;D15:LA
 Bel ;;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
Set →
 → Query

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
Set →
 → Query

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;<LF>#510000 <Raw Data><LF>	

:ACquire<X>:LMEMory?

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;<LF>#72000000<Raw Data><LF>

:ACquire<X>:STATe?

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 →

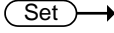
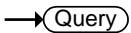
:ACquire:RECOrdlength

→ 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:RECOrdlength? AUTO The record length is currently set to AUTO.						
:HEADer	<div style="text-align: right;">   </div>						
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	<table border="0"> <tr> <td><X></td> <td>Channel number (1 to 4)</td> </tr> <tr> <td>ON</td> <td>Add header information.</td> </tr> <tr> <td>OFF</td> <td>Don't add header information.</td> </tr> </table>	<X>	Channel number (1 to 4)	ON	Add header information.	OFF	Don't add header information.
<X>	Channel number (1 to 4)						
ON	Add header information.						
OFF	Don't add header information.						
Return parameter	Returns the configuration (ON, OFF) for the selected channel.						
Example	:HEADer ON						

Autoscale Commands

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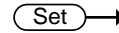
:AUTOSet



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

:CHANnel<X>:BWLimit.....	47
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:CHANnel<X>:SCALE	51

: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)

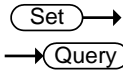
Description Returns the impedance of the oscilloscope.

Syntax :CHANnel<X>:IMPedance?

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

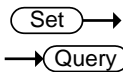
Return parameter <NR3> Returns the impedance value.

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.	

:CHANnel<X>:PROBE:RATio (Set) →
→ (Query)

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	

:CHANnel<X>:PROBE:TYPE (Set) →
→ (Query)

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.	

:CHANnel<X>:SCALE (Set) →
→ (Query)

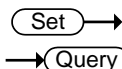
Description	<p>Sets or returns the vertical scale. The scale depends on the probe attenuation factor.</p> <p>Note the probe attenuation factor should be set before the scale.</p>
-------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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	

Math Commands

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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	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 2px;">DUAL</td> <td style="padding: 2px;">Dual channel operations</td> </tr> <tr> <td style="padding: 2px;">ADVanced</td> <td style="padding: 2px;">Advanced math operations</td> </tr> <tr> <td style="padding: 2px;">FFT</td> <td style="padding: 2px;">FFT operations</td> </tr> </table>	DUAL	Dual channel operations	ADVanced	Advanced math operations	FFT	FFT operations
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	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 2px;"><X></td> <td style="padding: 2px;">Source number 1 or 2</td> </tr> <tr> <td style="padding: 2px;">CH1~4</td> <td style="padding: 2px;">Channel 1 to 4</td> </tr> <tr> <td style="padding: 2px;">REF1~4</td> <td style="padding: 2px;">Reference waveforms 1 to 4</td> </tr> </table>	<X>	Source number 1 or 2	CH1~4	Channel 1 to 4	REF1~4	Reference waveforms 1 to 4
<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
Return parameter	<NR3>	Returns the scale.
Example	:MATH:DUAL:SCALE 2.0E-3 Sets the vertical scale to 2mV/2mA.	

Set →
 → Query

:MATH:FFT:SOURce

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.	

Set →
 → Query

:MATH:FFT:MAG

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.	

Set →
 → Query

:MATH:FFT:WINDow

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.

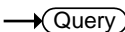
Syntax :MATH:ADVanced:EDIT:SOURce { CH1 | CH2 | CH3 | CH4 | ? }

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 (+).

Set →
 → Query

:MATH:ADVanced:POSition

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.	

Set →
 → Query

:MATH:ADVanced:SCALE

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	

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Set →

→ Query

:CURSor:MODE

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.

 									
: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	<table border="0"> <tr> <td>SEConds</td> <td>Sets the cursor units to time in seconds.</td> </tr> <tr> <td>HERtz</td> <td>Sets the cursor units to frequency.</td> </tr> <tr> <td>DEGrees</td> <td>Sets the cursor units to degrees.</td> </tr> <tr> <td>PERcent</td> <td>Sets the cursor units to percent.</td> </tr> </table>	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.
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.								

	
: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.

Set →
 → Query

:CURSor:VUNI

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.	

Set →

:CURSor:VUSE

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.	

→ Query

:CURSor:DDT

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

Set →

→ Query

:CURSor:H1Position

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.

Set →

→ Query

:CURSor:H2Position

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.


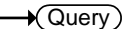
:CURSor:XY:RECTangular:X:DELta → Query

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> .
------------------	--------------------------	-------------------------------------------------------------------------

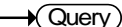
Example :CURSor:XY:RECTangular:X:DELta?
 80.0E-3
 Returns the horizontal delta as 80mV.

:CURSor:XY:RECTangular:Y:POSition<X>  

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 

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> 

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 → Query

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> → Query

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 → Query

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 →

:DISPlay:INTensity:GRATICule

→ Query

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 →

:DISPlay:PERsistence

→ Query

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 →

:DISPlay:GRATICule


→ Query

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 .

Set →
 → Query

: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.	

→ Query

:DISPlay:OUTPut

Description	Returns the screen image as a 16 bit RGB run length encoded image.	
Syntax	:DISPlay:OUTPut {?}	
Return parameter	Format: header+data+LF For example assuming the image data size is 31649 bytes then the following would be returned: #531649<[count] [color] [count] [color]..... ><LF> Where #531649 is the header, each [count] and [color] data are 2 bytes and <LF> is a line feed character.	

Hardcopy Commands

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:HARDcopy:START

Set →

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

Set →

→ Query

Description Sets or queries whether hardcopy is set to print or save.

Syntax :HARDcopy:MODE { PRINT | SAVE | ? }

Related Commands :HARDcopy:START

Parameter	PRINT	Print mode
	SAVE	Save mode

Return parameter Returns the mode.(PRINT/SAVE)

Example :HARDcopy:MODE PRINT
 Sets hardcopy to print.

:HARDcopy:PRINTINKSaver

Set →

→ Query

Description Sets Inksaver On or Off for printing.

Syntax :HARDcopy:PRINTINKSaver { OFF | ON | ? }

Related Commands :HARDcopy:START
 :HARDcopy:MODE

Parameter	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 (Set) →
→ (Query)

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 (Set) →
→ (Query)

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.

Set →

→ Query

: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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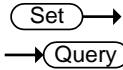
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:MEASure:GATing
 Set →
 → Query

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.	



: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



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	<pre>:MEASure:SOURce1 CH1 :MEASure:FOVShoot? 1.27E+0</pre> 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.
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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

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

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 :MEASure:SOURce1 CH1
 :MEASure:PK2Pk?
 2.04E-1
 Selects Channel 1, and then measures the peak-to-peak amplitude.

: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 :MEASure:SOURce1 CH1
 :MEASure:RMS?
 1.31E-3
 Selects Channel 1, and then measures the RMS voltage/current.

: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



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> <p>Select channel 1 and 2 as source1/2, and then measure FRR.</p>	

: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

```
:MEASure:SOURce1 CH1
:MEASure:SOURce2 CH2
:MEASure:FFFDelay?
-8.89E-6
```

Select channel 1 and 2 as delay source1/2, and then measure FFF.

: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

```
:MEASure:SOURce1 CH1
:MEASure:SOURce2 CH2
:MEASure:LRRDelay?
-8.89E-6
```

Select channel 1 and 2 as delay source1/2, and then measure LRR.

: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 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: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 Commands :MEASure:SOURce<X>

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: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 | CRM s | 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 :MEASure: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 → Query

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.

:MEASUREMENT:STATISTICS:WEIGHTING (Set) →
→ (Query)

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 (Set) →
→ (Query)

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 (Set) →
→ (Query)

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> | ?}

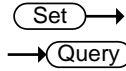
Related commands :REF<X>:DISPlay

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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:TIMebase:EXPand

Description	Sets or queries the horizontal expansion mode. Only available for firmware V1.18 or above.	
Note	Requires the Horizontal Expansion app. Available for download on the GW Instek website.	
Syntax	:TIMebase:EXPand {CENTER TRIGger?}	
Parameter/Return parameter	CENTer	Expand from the center of the display.
	TRIGger	Expand from the trigger point.
Example	:TIMebase:EXPand TRIGger Sets the expansion point to the trigger point.	

: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 →

:TIMEbase:SCALE

→ Query

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 →

:TIMEbase:MODE

→ Query

Description	Sets or queries the time base mode. The time base mode determines the display view window on the scope.	
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.	

Set →

:TIMEbase:WINDow:POSition

→ Query

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

Set →

→ Query

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



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 →

→ Query

:TRIGger:TYPE

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 →

→ Query

:TRIGger:SOURce

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.

:TRIGger:COUple

Set →

→ Query

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.	

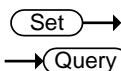
Set →

→ Query

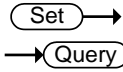
:TRIGger:LEVel

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

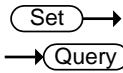


Description	Sets or queries the high trigger level.	
Note	Applicable for Rise and Fall/Pulse Runt triggers.	
Syntax	:TRIGger:HLEVel {TTL ECL <NRf> ?}	
Related commands	:TRIGger:TYPe	
Parameter	<NRf>	High level value.
	TTL	Sets the high trigger level to TTL.
	ECL	Sets the high trigger level to ECL.
Return 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.	




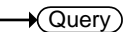
:TRIGger:LLEVel

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.	


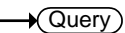


:TRIGger:EDGE:SLOP


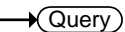
Description	Sets or queries the trigger slope.	
Syntax	:TRIGger:EDGE:SLOP {RISe FALL EITHer ?}	
Related commands	:TRIGger:TYPe	
Parameter	RISe	Rising slope
	FALL	Falling slope
	EITHer	Either rising or falling slope
Return parameter	Returns the trigger slope.	
Example	:TRIGger:EDGE:SLOP FALL Sets the 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	<table border="1"> <tr> <td>RISe</td> <td>Rising slope</td> </tr> <tr> <td>FALL</td> <td>Falling slope</td> </tr> <tr> <td>EITHer</td> <td>Either rising or falling slope</td> </tr> </table>	RISe	Rising slope	FALL	Falling slope	EITHer	Either rising or falling slope
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	<table border="1"> <tr> <td>TImE</td> <td>Sets the delay type to time.</td> </tr> <tr> <td>EVENt</td> <td>Sets the delay type to event.</td> </tr> </table>	TImE	Sets the delay type to time.	EVENt	Sets the delay type to event.
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:TImE	
Description	Sets or queries the delay time value.
Syntax	:TRIGger:DElay:TImE {<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.

Set →
 → Query

: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 (≠).

Set →
 → Query

: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.	

Set →
→ Query

: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.

Set →
→ Query

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

Set →
→ Query

: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 (≠).


Set →

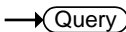
→ Query

: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.





: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.	



: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.	

		Set →
		→ Query
: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	

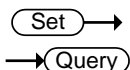
		Set →
		→ Query
:TRIGger:EXTERnal:PROBe:RATio		
Description	Sets or queries the external probe ratio (attenuation).	
Syntax	:TRIGger:EXTERnal:PROBe:RATio {<NRf> ?}	
Related commands	:TRIGger:EXTERnal:PROBe:TYPe	
Parameter	<NRf>	External probe attenuation factor.
Return parameter	<NR3>	Returns the probe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

		→ Query
: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



Description	Sets or queries the I ² C 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.

: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.	

: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 | TXPARIttyerr | RXPARTtyerr | ? }

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.
	RXPARTtyerr	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.
	TXPARIttyerr	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.

Example 1 :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)

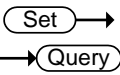
Description	Sets or queries the number of words for SPI data.	
Note	This setting only applies when the SPI trigger is set to trigger on MISO, MOSI or MISO/MOSI	
Syntax	:TRIGger:BUS:B1:SPI:DATA:SIZE {<NR1> ?}	
Related commands	:TRIGger:BUS:B1:SPI:CONDition	
Parameter	<NR1>	Number of words (1 to 32).
Return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



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.	

Example 1 :BUS1:PARAllel:WIDth 8
 :TRIGger:BUS:B1:PARAllel:VALue "1x1x0101"
 Sets the value to 1x1x0101

Example 2 :TRIGger:BUS:B1:PARAllel:VALue?
 1X1X0101

:TRIGger:LOGic:FUNCTion



Description	Sets or queries the Boolean logical for the logic trigger. Only available for firmware V1.18 or above.	
Syntax	:TRIGger:LOGic:FUNCTion {AND NAND NOR OR ?}	
Related commands	:TRIGger:LOGic:PATtern:INPut:D<X>	

Parameter/Return parameter	AND	AND logic trigger
	NAND	NAND logic trigger
	NOR	NOR logic trigger
	OR	OR logic trigger

Example TRIGger:LOGic:FUNcTion AND
Sets the logic function to AND.

Set →

:TRIGger:LOGic:INPut:CLOCK:SOURce

→ 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


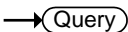
→ Query

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:DELTATIME 1.000e-08;

:TRIGger:LOGic:PATtern:INPut:D<X>  

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)
----------------------------	-------	------------------------------------------------------

Example :TRIGger:LOGic:PATtern:DELTatime?
8.960e-05

Set →

← Query

:TRIGger:LOGic:PATtern:WHEn

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


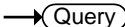
Syntax :TRIGger:LOGic:PATtern:WHEn { TRUE | FALSE | LESSthan | THAN | Equal | UNEQUAL | ? }

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

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

Example2 :TRIGger:LOGic:PATtern:WHEn?
FALSE

:TRIGger:TIMEOut:WHEn  

Description Sets or queries the timeout trigger condition.

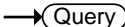
Syntax :TRIGger:TIMEOut:WHEn {HIGH|LOW|EITher|?}

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	148
:SYSTem:ERRor	148

: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

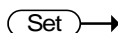


Description	Queries the error queue. See the appendix on page 235 for details.	
Syntax	:SYSTem:ERRor?	
Return parameter	Returns the last message in the error queue.	
Example	:SYSTem:ERRor? +0, "No error."	

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.

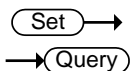
Example 2 :SAVE:WAVEform:FILEFormat LSF
 :SAVE:WAVEform ALL, "Disk:/ALL001"
 Sets the file format to LSF. A folder named "ALL001" is created and saves all displayed waveforms to the "ALL001" directory in the LSF format.

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 LMFCVS ?}	
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)
	LMFCVS	Sets the file format to LM fast CSV. (xxx.CSV)
Return parameter	Returns the file format (LSF , DCSV, FCSV , LMDCSV,LMFCVS).	

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

Ethernet Commands

The Ethernet commands are only available when the DS2-LAN option is installed.

:ETHERnet:DHCP155

:ETHERnet:DHCP
 →
 →

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

:DATE156

: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

The Bus Decode commands are only available when the DS2-8LA or DS2-16LA option is installed.

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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 I²C 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 I²C address.

:BUS1:I2C:SCLK:SOURce



Description Sets or queries which channel is used for the I²C 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
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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 I²C 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 →

:BUS1:UART:BITRate

← Query

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	15200
	1	75	19200
	2	110	28800
	3	134	31250
	4	150	38400
	5	300	56000
	6	600	57600
	7	1200	76800
	8	1800	115200
	9	2000	128000
	10	2400	230400
	11	3600	460800
	12	4800	921600
	13	7200	1382400
	14	9600	1843200
	15	14400	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

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 Binary format
HEXadecimal Hexadecimal format

Example : BUS1:DISPlay:FORMAt BINary
Sets the display format to binary.

:LISTer:DATA


Description Returns the Event Table data as a binary block data.

Syntax :LISTer:DATA?

Return Parameter Returns the event table as binary block data. The binary block data contains comma separated data with new lines at the end of each row.

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.

Search Commands

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:SEARCH:COPY

(Set) →

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.	

(Set) →

:SEARCH:STATE

→ (Query)

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 (Set) →
→ (Query)

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 (Set) →
→ (Query)

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.

: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.

: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 (≠).

Set →

→ Query

: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.

Set →

→ Query

: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 (≠).

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

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.

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

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  

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:FUNction  

Description	Sets or queries the Boolean logic function for logic trigger search. Only available for firmware V1.18 or above.	
Syntax	:SEARCH:TRIGger:LOGic:FUNction {AND NAND NOR OR}	
Related commands	:SEARCH:TRIGger:LOGic:PATtern:INPut:D<X>	
Parameter/Return parameter	AND	AND logic trigger
	NAND	NAND logic trigger
	NOR	NOR logic trigger
	OR	OR logic trigger

Example1 SEARCH:TRIGger:LOGic:FUNction NAND
Sets the search trigger logic function to NAND.

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

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;

:SEARCH:TRIGger:LOGic:PATtern:INPut:D  


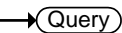
Description Sets or queries the search trigger logic for the selected digital input.

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).

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

:SEARCH:TRIGger:LOGic:PATtern:DELTAtime  

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

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

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

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

:SEARCH:TRIGger:LOGic:PATtern:WHEn Set →
 → Query

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:DELtAtime
------------------	-----------------------------------------

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

	UNEQUAL	Set less than mode Is True \neq time period* *Set from :SEARCH:TRIGger:LOGic:PATtern :DELTatime
Example 1	:SEARCH:TRIGger:LOGic:PATtern:WHEn	FALSE Set the logic to false.
Example 2	:SEARCH:TRIGger:LOGic:PATtern:WHEn?	FALSE

:SEARCH:TRIGger:BUS:TYPE → Query

Description	Returns the current bus type.	
Syntax	:SEARCH:TRIGger:BUS:TYPE?	
Return parameter	I2C	I2C mode
	SPI	SPI mode
	UART	UART mode
	PARALLEL	Parallel mode
Example	:SEARCH:TRIGger:BUS:TYPE?	UART

Set →

:SEARCH:TRIGger:BUS:B1:I2C:CONDition → 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 I²C bus search trigger condition.

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

:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:M Set →
 ODe Query

Description Sets or queries the I²C 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:ADDRess:MODE? 0
The addressing mode is current set to 7 bits.

`:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:TY`  
`Pe`

Description	Sets the I ² C bus address type, or queries what the setting is for the search trigger.	
Syntax	<code>:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:TYPe</code> {GENERALcall STARTbyte HSmode EEPROM CBUS ?}	
Related commands	<code>:SEARCH:TRIGger:BUS:B1:I2C:CONDition</code>	
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	<code>:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:TYPe?</code> CBUS	

`:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:V`  
`ALue`

Description	Sets or queries the I ² C bus address value when the I ² C search trigger is set to trigger on Address or Address/Data.	
Syntax	<code>:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:VALue</code> {string ? }	
Related commands	<code>:SEARCH:TRIGger:BUS:B1:I2C:ADDRess:MODE</code>	

Parameter	<string>	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:DI Set →
Rection ← Query

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:ADDRess: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.

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

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

Note This setting only applies when the I²C 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.

:SEARCH:TRIGger:BUS:B1:I2C:DATA:VALue  

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

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

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

Example 1 :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 Set →
 n ← Query


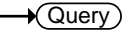
Description Sets or queries the UART search triggering condition.

Syntax :SEARCH:TRIGger:BUS:B1:UART:CONDitio
 { RXSTArt | RXDATA | RXENDPacket | TXSTArt |
 TXDATA | TXENDPacket | TXPARIttyerr | RXPARIttyerr
 | ? }

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


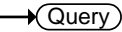
Syntax :SEARCH:TRIGger:BUS:B1:UART:RX:DATA:SIZE {<NR1> | ?}

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.

:SEARCH:TRIGger:BUS:B1:UART:RX:DATA:  →
VALue 

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

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

Related commands :SEARCH: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
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Return Parameter Returns the data value.

Example 1 :SEARCH:TRIGger:BUS:B1:UART:CONDition RXDATA
 :SEARCH:TRIGger:BUS:B1:UART:RX:DATA:SIZE 1
 :SEARCH:TRIGger:BUS:B1:UART:RX:DATA:VALue
 "1x1x0101"

 Sets the value to 1x1x0101

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

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

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 Tx Data

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).
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Return parameter	<NR1>	Returns the number of bytes.
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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 (Set) →
→ (Query)

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	<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.

Example 1 :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

:SEARCH:TRIGger:BUS:B1:SPI:CONDition (Set) →
→ (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.



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: 
 VALue 

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 | ? }


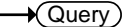
Related commands :SEARCH:TRIGger:BUS:B1:SPI:DATA:SIZE

Parameter	<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.

Example 1 :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	<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: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	<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.	
Example 1	: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

The digital commands are only available when the DS2-8LA or DS2-16LA option is installed.

:D<X>:DISPlay	196
:D<X>:POSition	196
:DISPlay:DIGital:HEIght	197
:DIGital:GROU<X>:THREShold	197
:DIGital:ANALog:A<X>:DISPlay	198
:DIGital:ANALog:A<X>:RATio	199
:D<x>:MEMory.....	199
:D<x>:LMEMory.....	200
:DIGital:MEMory	201
:DIGital:LMEMory	201

:D<X>:DISPlay (Set) →
→ (Query)

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 (Set) →
→ (Query)

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.
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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.	
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Syntax	:DISPlay:DIGital:HEIght {SMALL MEDIUm LARge ?}	
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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.	
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Syntax	:DIGital:GROUP<X>:THREShold { ECL TTL PECL CMOS5 CMOS3 CMOS2 <NR3> ? }	
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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> Returns the threshold level.

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 (Set) →
→ (Query)

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.
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Example1 :DIGital:ANALog:A1:RATio 0.1
Sets the analog waveform scale for A1 to 0.1.

:D<x>:MEMory → (Query)

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
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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;<LF>#510000<Raw Data><LF>

:D<x>:LMEMory



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;<LF>#72000000<Raw Data><LF>

:DIGital:MEMory

→ Query

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,000000000001100,Memory Length,5000,IntpDistance,0,Trigger Address,2500,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,;Label11,;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;<LF>#510000<Raw Data><LF>

:DIGital:LMEMory

→ Query

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,;Label11,;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

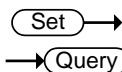
16:52:08,Waveform Data;<LF>#72000000<Raw Data><LF>

Label Commands

The commands, “:BUS1:LABel”, “:BUS1:LABel:DISPlay”, “:D<X>:LABel”, “:D<X>:LABel:DISPlay”, “DIGital:ANALog:A<X>:LABel” and “DIGital:ANALog:A<X>:LABel” are only available when the DS2-8LA or DS2-16LA option is installed.

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:DIGital:ANALog:A<X>:LABel.....	209
:DIGital:ANALog:A<X>:LABel:DISPlay.....	210
:SET<X>:LABel.....	210

:CHANnel<X>:LABel

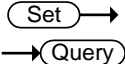


Description	Sets or returns the file label for the selected channel.	
Syntax	:CHANnel<X>:LABel {<string> ?}	
Related commands	:CHANnel<X>:LABel:DISPlay	
Parameter	<X>	Channel 1, ,2, 3, 4
	<string>	The string must be no more than 8 characters and only contain alphanumeric characters in addition to period, dash and underscore characters. The string must be enclosed in double quotes, “string”.

Return parameter	<code><string></code>	Returns the label for the selected channel. No return indicates that there has not been a file label assigned for the selected channel.
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Example1	:CHANnel1:LABel "CH1_lab" Sets the channel 1 label as "CH1_lab".
----------	---------------------------------------------------------------------

Example2	:CHANnel1:LABel? CH1_lab
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: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	<code><X></code> 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.
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: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

:REF<X>:LABel:DISPlay



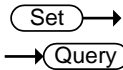
Description	Turns the label on/off for the selected reference waveform or returns its status.	
Syntax	:REF<X>:LABel:DISPlay { OFF ON ? }	
Related commands	:REF<X>:LABel	

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

Set →

→ Query

: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.

Set →

→ Query

:D<X>:LABel

Description Sets or returns the waveform label for the selected digital channel.

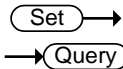
Syntax :D<X>:LABel {<string> | ?}

Related commands :D<X>:LABel:DISPlay

Parameter	<X> <string>	Digital Channel D(0 to 15) 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

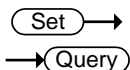


:D<X>:LABel:DISPlay

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> OFF ON	Digital channel D(0 to 15) Turns the file label off for the selected digital channel. 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

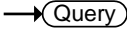
Parameter	<X>	Analog waveform A(1 or 2)
	<string>	The string must be no more than 8 characters and only contain alphanumeric characters in addition to period, dash and underscore characters. The string must be enclosed in double quotes, "string".

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.
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Example1 :DIGital:ANALog:A1:LABel "A1_lab"
 Sets the label for analog waveform 1 as "A1_lab".

Example2 :DIGital:ANALog:A1:LABel?
 A1_lab

:DIGital:ANALog:A<X>:LABel:DISPlay




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> <string>	Setup number 1 to 20 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

:BUZZER212

:BUZZER

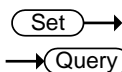



Description	Turns the buzzer on or off or queries its status.	
Syntax	:BUZZER { OFF ON ? }	
Parameter/ Return parameter	OFF	Turns the buzzer off.
	ON	Turns the buzzer on.
Example1	:BUZZER? OFF The buzzer is off.	

Segment Commands

:SEGMENTS:STATE	213
:SEGMENTS:CURRENT	214
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:SEGMENTS:TIME	214
:SEGMENTS:DISPALL	215
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:SEGMENTS:STATE



Description Turns the segmented memory function on/off or queries its state.

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

Related commands :RUN ; :STOP

Parameter/ Return parameter	OFF	Turns the segmented memory off.
	ON	Turns the segmented memory on.

Example1 :SEGMENTS:STATE ON
Turns segmented memory on.

Set →
 → Query

:SEGMENTS:CURRENT

Description	Sets or queries the current segment.	
Syntax	:SEGMENTS:CURRENT {SETTOMIN SETTOMAX NR1 ?}	
Related commands	:SEGMENTS:STATE ; :SEGMENTS:TOTALNUM	
Parameter/ Return parameter	SETTOMIN	Current segment = min segment
	SETTOMAX	Current segment = max segment
	<NR1>	1~2048
Example1	:SEGMENTS:CURRENT 10 Sets the current segment to segment number 10.	

Set →
 → Query

:SEGMENTS:TOTALNUM

Description	Sets or queries the total number of segments for the segmented memory function.	
Syntax	:SEGMENTS:TOTALNUM {SETTOMIN SETTOMAX <NR1> ?}	
Related commands	:SEGMENTS:STATE ; :SEGMENTS:CURRENT	
Parameter/ Return parameter	SETTOMIN	Sets to the minimum number
	SETTOMAX	Sets to the maximum number
	<NR1>	1~2048
Example1	:SEGMENTS:TOTALNUM SETTOMAX Sets the number of segments to max number (2048).	

→ Query

:SEGMENTS:TIME

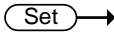

Description	Returns the time of the current segment in relation to the first segment.
-------------	---------------------------------------------------------------------------

Syntax	:SEGMents:TIME?
Related commands	:SEGMents:STATE ; :SEGMents:CURRent
Return parameter	The segment time as <NR3>.
Example	:SEGMents:TIME? >8.040E-03 Returns the segment time.

:SEGMents:DISPALL



Description	Sets or queries whether all the segments are displayed on the screen.	
Syntax	:SEGMents:DISPALL {OFF ON ?}	
Related commands	:SEGMents:STATE ; :SEGMents:CURRent	
Parameter/ Return parameter	OFF	Turns the display all function off.
	ON	Turns the display all function on.
Example1	:SEGMents:DISPALL ON Turns the display all function on.	

:SEGMents:MEASure:MODE



Description	Sets or queries the measurement mode.	
Syntax	:SEGMents:MEASure:MODE {OFF PLOT TABLE ?}	
Related commands	:MEASUrement:MEAS<x>	
Parameter/ Return parameter	OFF	Disables the automatic measurement function for the segments measurement.
	PLOT	Sets the measurement mode to Statistics.

TABLE	Sets the measurement mode to a measurement list.
-------	--------------------------------------------------

Example1 :SEGMents:MEASure:MODE?
>PLOT
Returns the measurement mode as Statistics.

(Set) →

:SEGMents:MEASure:PLOT:SOURce ← (Query)

Description	Sets or queries the statistics source.
-------------	----------------------------------------

Syntax	:SEGMents:MEASure:PLOT:SOURce {<NR1> ? }
--------	---------------------------------------------

Related commands	:SEGMents:MEASure:MODE ; :SEGMents:MEASure:PLOT:DIVide ; :SEGMents:MEASure:PLOT:SElect ; :SEGMents:MEASure:PLOT:RESults
------------------	-------------------------------------------------------------------------------------------------------------------------

Parameter/ Return parameter	<NR1>	1~8 (Automatic measurement item 1~8)
--------------------------------	-------	--------------------------------------

Example1 :SEGMents:MEASure:PLOT:SOURce 1
Sets the source as auto measurement item 1.

(Set) →

:SEGMents:MEASure:PLOT:DIVide ← (Query)

Description	Sets or queries the number of bins for the statistics function.
-------------	-----------------------------------------------------------------

Syntax	:SEGMents:MEASure:PLOT:DIVide {<NR1> ? }
--------	---------------------------------------------

Related commands	:SEGMents:MEASure:PLOT:SOURce ; :SEGMents:MEASure:PLOT:SElect
------------------	---------------------------------------------------------------

Parameter/ Return parameter	<NR1>	1~20
--------------------------------	-------	------

Example1 :SEGMents:MEASure:PLOT:DIVide 5
Sets the number bins to 5 for the statistics function.

		Set →
		→ Query
:SEGMents:MEASure:PLOT:SElect		
Description	Sets or queries which bin to view the statics of.	
Syntax	:SEGMents:MEASure:PLOT:SElect {<NR1> ? }	
Related commands	:SEGMents:MEASure:PLOT:SOURce ; :SEGMents:MEASure:PLOT:DIVide	
Parameter	<NR1>	1~20 (cannot exceed the number of bins)
Return parameter	Return the bin number as <NR3>.	
Example1	:SEGMents:MEASure:PLOT:SElect 5 Set to bin number 5.	

		→ Query
:SEGMents:MEASure:PLOT:RESults		
Description	Returns the results of the currently selected bin for the statistics measurement.	
Syntax	:SEGMents:MEASure:PLOT:RESults?	
Related commands	:SEGMents:MEASure:PLOT:SOURce ; :SEGMents:MEASure:PLOT:DIVide ; :SEGMents:MEASure:PLOT:SElect	
Return parameter	Returns the statistics measurements as a string.	
Example	:SEGMents:MEASure:PLOT:RESults? > MAX:240mv,MIN:200mv,MEAN:206mv,Bin Statistics:15 of 20,Percent:0.00%,Count:0,Measured:345,Unmeasured:0,Bin Range:228~230mv	

		Set →
		→ Query
:SEGMents:MEASure:TABLE:SOURce		
Description	Sets or queries the source of the measurement list.	
Syntax	:SEGMents:MEASure:TABLE:SOURce {CH1 CH2 CH3 CH4 ? }	

Related commands :SEGMents:MEASure:MODE ; :SEGMents:MEASure:TABLE:SElect ; :SEGMents:MEASure:TABLE:LIST

Parameter/ Return parameter CH1~CH4 Channel 1 to 4

Example1 :SEGMents:MEASure:TABLE:SOURce CH1
Sets the source to CH1.

Set →

:SEGMents:MEASure:TABLE:SElect

← Query

Description Sets or queries a segment to view in the measurement table.

Syntax :SEGMents:MEASure:TABLE:SElect {<NR1> | ? }

Related commands :SEGMents:TOTALnum

Parameter <NR1> 1~2048

Return parameter Returns the number of segments as <NR3>.

Example1 :SEGMents:MEASure:TABLE:SElect 10
Select segment number 10.

:SEGMents:MEASure:TABLE:LIST

← Query

Description Returns the measurement results of each segment in the list.

Syntax :SEGMents:MEASure:TABLE:LIST?

Return parameter Returns the measurements results as a string for each segment.

Example :SEGMents:MEASure:TABLE:LIST?
>"GW GDS-2064A, serial number P930116, version V1.11",Segment Summary : CH1, Seg.,Pk-Pk (V),Pk-Pk (V),1,8.00m,8.00m.....etc

:SEGMents:MEASure:TABLE:SAVE (Set) →

Description Saves the list of segment automatic measurement results.

Syntax :SEGMents:MEASure:TABLE:SAVE

:SEGMents:SAVE (Set) →

Description Saves the segments.

Syntax :SEGMents:SAVE

Related Commands :SEGMents:SAVE:SOURce ; :SEGMents:SAVE:SElect:START ; :SEGMents:SAVE:SElect:END

Example :SEGMents:SAVE:SOURce CH1
 :SEGMents:SAVE:SElect:START 1
 :SEGMents:SAVE:SElect:END 10
 :SEGMents:SAVE

:SEGMents:SAVE:SOURce (Set) →
→ (Query)

Description Sets or queries the source segment waveform to save.

Syntax :SEGMents:SAVE:SOURce {CH1 | CH2 | CH3 | CH4 | ? }

Parameter/ Return parameter	CH1~CH4	Channel 1 to 4.
--------------------------------	---------	-----------------

Example :SEGMents:SAVE:SOURce CH1
 >Sets the source to CH1.

Set →

→ Query

:SEGMENTS:SAVE:SELECT:START

Description	Sets or queries the starting segment to save from.	
Syntax	:SEGMENTS:SAVE:SELECT:START {SETTOMIN SETTOMAX <NR1> ? }	
Related commands	:SEGMENTS:TOTALNUM	
Parameter/ Return parameter	SETTOMIN	Sets the starting segment to min segment.
	SETTOMAX	Sets the starting segment to the max segment.
	<NR1>	Sets the segment to 1~2048.

Example :SEGMENTS:SAVE:SELECT:START 2
Sets the starting segment to segment number 2.

Set →

→ Query

:SEGMENTS:SAVE:SELECT:END

Description	Sets or queries the ending segment to save from.	
Syntax	:SEGMENTS:SAVE:SELECT:END {SETTOMIN SETTOMAX <NR1> ? }	
Related commands	:SEGMENTS:TOTALNUM	
Parameter/ Return parameter	SETTOMIN	Sets the starting segment to min segment.
	SETTOMAX	Sets the starting segment to the max segment.
	<NR1>	Sets the segment to 1~2048.

Example :SEGMENTS:SAVE:SELECT:END 10
Sets the ending segment to segment number 10.

DVM Commands

The DVM commands are only available when the optional DVM software is installed.

:DVM:STATE	221
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:DVM:STATE

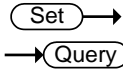



Description	Sets or queries the DVM state to on or off.	
Syntax	:DVM:STATE {OFF ON ? }	
Related commands	:DVM:SOURce ; :DVM:MODe	
Parameter/ Return parameter	OFF	Turns the DVM off.
	ON	Turns the DVM on.
Example	:DVM:STATE ON Turns the DVM state on.	

:DVM:SOURce




Description	Sets or queries the source of the DVM.	
Syntax	:DVM:SOURce {CH1 CH2 CH3 CH4 ?}	
Related commands	:DVM:SOURce ; :DVM:MODe	
Parameter/ Return parameter	CH1~CH4	Channel 1 to 4.
Example	:DVM:SOURce CH1 Sets the DVM source to channel 1.	



:DVM:MODE

Description	Sets or queries the DVM mode.	
Syntax	:DVM:MODE {ACRMS DC DCRMS DUTY FREQUENCY ?}	
Related commands	:DVM:SOURce ; :DVM:STATE	
Parameter/ Return parameter	ACRMS	Sets the mode of the DVM to AC RMS
	DC	Sets the mode of the DVM to DC
	DCRMS	Sets the mode of the DVM to DC RMS
	DUTY	Sets the mode of the DVM to AC Duty
	FREQUENCY	Sets the mode of the DVM to AC frequency
Example	:DVM:MODE DUTY Sets the DVM mode to DUTY.	

Function Generator Commands

The function generator commands are only available when the DS2-FGN option is installed.

:FUNction<x>:MODE.....	223
:FUNction<x>:FREQuency.....	223
:FUNction<x>:AMPlitude.....	224
:FUNction<x>:OFFSet	224
:FUNction<x>:DUTYcycle	225

:FUNction<x>:MODE

Set →

→ Query

Description	Sets or queries the function generator mode.	
Syntax	:FUNction<x>:MODE {SINE SQUAre TRIAngle ?}	
Related commands	:FUNction<x>:FREQuency ; :FUNction<x>:AMPlitude :FUNction<x>:OFFSet ; :FUNction<x>:DUTYcycle	
Parameter/ Return parameter	<x>	Module 1 or 2.
	SINE	Sets the function generator to Sine
	SQUAre	Sets the function generator to Square
	TRIAngle	Sets the function generator to Triangle

Example :FUNction1:MODE SINE
Sets the function generator mode to Sine for the function generator in module slot 1.

Set →

→ Query

:FUNction<x>:FREQuency

Description	Sets or queries the function generator frequency.
Syntax	:FUNction<x>:FREQuency {<NRf> ?}
Related commands	:FUNction<x>:MODE

Parameter	<x> <NRf>	Module 1 or 2. The frequency of the function generator in Hz. (0.1 ~ 5000000)
Return parameter	Returns the frequency of the function generator function in <NR3> format.	

Example :FUNction1:FREquency 1000
Sets the function generator frequency to 1kHz for the function generator in module slot 1.

:FUNction<x>:AMPlitude Set →
→ Query

Description	Sets or queries the function generator amplitude.	
Syntax	:FUNction<x>:AMPlitude {<NRf> ?}	
Related commands	:FUNction<x>:MODE	

Parameter	<x> <NRf>	Module 1 or 2. The amplitude of the waveform in volts.
Return parameter	Returns the amplitude of the function generator function in <NR3> format.	

Example :FUNction1:AMPlitude 2.00
Sets the function generator amplitude to 2.00 Vpp.

:FUNction<x>:OFFSet Set →
→ Query

Description	Sets or queries the function generator DC offset.	
Syntax	:FUNction<x>:OFFSet {<NRf> ?}	
Related commands	:FUNction<x>:MODE	

Parameter	<x> <NRf>	Module 1 or 2. (-1 ~ +1) The offset of the waveform in volts.
-----------	--------------	------------------------------------------------------------------

Return parameter Returns the offset of the function generator function in <NR3> format.

Example :FUNction1:OFFSet 1.00
Sets the function generator offset to 1.00 volts.

:FUNction<x>:DUTYcycle 

Description Sets or queries the duty cycle for the square mode waveform.

Syntax :FUNction<x>:DUTYcycle {<NRf>|?}

Related commands :FUNction<x>:MODE

Parameter <x> Module 1 or 2.
<NRf> (5 ~ 95) The duty cycle as a percentage (5% ~ 95%)

Return parameter Returns the offset of the function generator function in <NR3> format.

Example :FUNction1:DUTYcycle 10
Sets the function generator duty cycle to 10%.

Go_NoGo Commands

The GoNoGo APP must first be launched (or use the command, “:GONogo:SCRipt”) before any of the Go_NoGo or Template commands can be used.

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:GONogo:EXECute	226
:GONogo:FUNCTion.....	227
:GONogo:NGCount	227
:GONogo:NGDefine.....	227
:GONogo:SOURce	228
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:TEMPlate:SAVe:MINimum	231
:TEMPlate:TOLerance.....	231
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:GONogo:CLear

Set →

Description Clears the Go/NoGo counter.

Syntax :GONogo:CLear

:GONogo:EXECute

Set →
→ Query

Description Enables or disables the Go/NoGo function or queries its state.

Syntax :GONogo:EXECute {OFF|ON|?}

Parameter/	OFF	Disabled
Return Parameter	ON	Enabled

Example :GONogo:EXECute OFF
Turns Go/NoGo off.

:GONogo:FUNCTION (Set) →

Description Initializes the Go/NoGo APP. This must be run after the Go/NoGo APP has been started.

Syntax :GONogo:FUNCTION

:GONogo:NGCount → (Query)

Description Returns the Go/NoGo counter.

Syntax :GONogo:NGCount {?}

Return parameter Returns a string in the following format “number of violations,total tests”

Example :GONogo:NGCount?
> 3,25
Indicates that 3 violations occurred over 25 tests.

:GONogo:NGDefine (Set) →
→ (Query)

Description Sets the Go/NoGo “When” conditions.

Syntax :GONogo:NGDefine {EXITs|ENTers|?}

Parameter/	EXITs	Sets the NoGo condition to when the input signal exceeds the limit boundary.
Return Parameter	ENTers	Sets the NoGo condition to when the input signal stays within the limit boundary.

Example :GONogo:NGDefine EXITs
Sets the Go/NoGo condition to EXITs.

Set →
 → Query

:GONogo:SOURce

Description	Sets the source for the Go/NoGo signal.	
Syntax	:GONogo:SOURce {CH1 CH2 CH3 CH4 ?}	
Parameter/ Return Parameter	CH1~CH4	
Example	:GONogo:SOURce CH1 Sets the source to CH1.	

Set →
 → Query

:GONogo:VIOLation

Description	Sets or returns actions for the Go/NoGo violations.	
Syntax	:GONogo:VIOLation {STOP STOP_Beep CONTInue CONTINUE_Beep ?}	
Parameter/ Return Parameter	STOP	The waveform will be frozen.
	STOP_Beep	The waveform will be frozen and a beep will be output.
	CONTInue	Ignore the violation.
	CONTINUE_Beep	Output a beep, but continue to monitor the signal.
Example	:GONogo:VIOLation STOP Sets violation action to STOP.	

Set →

:GONogo:SCRipt

Description	Activates/Deactivates the Go/NoGo APP or queries its state.	
Syntax	:GONogo:SCRipt {OFF ON ?}	
Parameter/ Return Parameter	ON	Turns Go/NoGo APP on.
	OFF	Turns the Go/NoGo APP off.

Example :GONogo:SCript?
 >ON
 The Go/NoGo script is on.

Set →

→ Query

:TEMPlate:MODE

Description Sets or returns the Go/NoGo template mode.

Syntax :TEMPlate:MODE{MAXimum|MINimum|AUTO|?}

Parameter/	MAXimum	Maximum template
Return Parameter	MINimum	Minimum template
	AUTO	Auto template

Example :TEMPlate:MODE AUTO
 Sets the template mode to AUTO.

Set →

→ Query

:TEMPlate:MAXimum

Description Defines or queries which waveform memory (REF1 or W1~W20) is set to the maximum template.

Syntax :TEMPlate:MAXimum{REF1|W1~W20|?}

Parameter/	REF1	Reference one
Return Parameter	W1~W20	Waveform memory 1 to 20

Example :TEMPlate:MAXimum REF1
 Saves the maximum template to REF1.

Set →

→ Query

:TEMPlate:MINimum

Description Defines or queries which waveform memory (REF1 or W1~W20) is set to the minimum template.

Syntax :TEMPlate:MINimum{REF2|W1~W20|?}

Parameter/	REF2	Reference one
------------	------	---------------

Return Parameter **W1~W20** Waveform memory 1 to 20

Example :TEMPlate:MINimum REF2
Saves the minimum template to REF2.

Set →

:TEMPlate:POSition:MAXimum

→ Query

Description Sets or queries the position of the maximum template.

Syntax :TEMPlate:POSition:MAXimum{NR2|?}

Parameter <NR2> Desired template position (-12.0 ~ +12.0 divisions)

Return parameter Returns the position in the following format:
“<NR2>Div”

Example :TEMPlate:POSition:MAXimum 3.00
Sets the maximum template position to 3.00 divisions.

Set →

:TEMPlate:POSition:MINimum

→ Query

Description Sets or queries the position of the minimum template.

Syntax :TEMPlate:POSition:MAXimum{NR2|?}

Parameter <NR2> Desired template position (-12.0 ~ +12.0 divisions)

Return parameter Returns the position in the following format:
“<NR2>Div”

Example :TEMPlate:POSition:MINimum 3.00
Sets the minimum template position to 3.00 divisions.

:TEMPlate:SAVe:MAXimum (Set) →

Description Saves the maximum template.

Syntax :TEMPlate:SAVe:MAXimum

:TEMPlate:SAVe:MINimum (Set) →

Description Saves the maximum template.

Syntax :TEMPlate:SAVe:MINimum

:TEMPlate:TOLerance (Set) →
→ (Query)

Description Sets or queries the tolerance as a percentage.

Syntax :TEMPlate:TOLerance{NR2|?}

Parameter/
Return Parameter <NR2> The auto tolerance range (0.4% ~ 40%)

Example :TEMPlate:TOLerance 10
Sets the tolerance to 10%.

:TEMPlate:SAVe:AUTO (Set) →

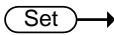
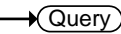
Description Saves the AUTO template (maximum and minimum templates).


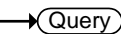
Syntax :TEMPlate:SAVe:AUTO

Data Logging Commands

The data logging commands are only available when the Datalog App is installed and the DS2-LAN option is installed. Note all data logging commands are only available for firmware V1.18 or above.

:DATALOG:STATE	232
:DATALOG:SOURce	232
:DATALOG:SAVe	233
:DATALOG:INTerval	233
:DATALOG:DURation.....	234

		 
:DATALOG:STATE		
Description	Sets or queries the state of the data logging app.	
Syntax	:DATALOG:STATE{OFF ON ?}	
Related commands	:DATALOG:SOURce :DATALOG:SAVe :DATALOG:INTerval :DATALOG:DURation	
Parameter/ Return parameter	OFF	Turns the data logging off.
	ON	Turns the data logging on.
Example	:DATALOG:STATE ON Turns the data logging app on.	

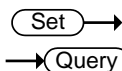
		 
:DATALOG:SOURce		
Description	Sets or queries the data logging source channel.	
Syntax	:DATALOG:SOURce {CH1~CH4 D0~D15 all ?}	

Related commands :DATALOG:STATE
 :DATALOG:SAVe
 :DATALOG:INTerval
 :DATALOG:DURation

Parameter/Return parameter	CH1 ~CH4	Channel 1, 2, 3 or 4
	D0~D15	Digital channels D0 to D15
	all	All displayed channels.

Example :DATALOG:SOURce CH1
 Sets the source to CH1.

:DATALOG:SAVe



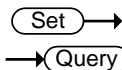
Description Sets or queries the save format as image or waveform.

Syntax :DATALOG:SAVe {IMAGe|WAVEform}[?]

Related commands :DATALOG:STATE
 :DATALOG:SOURce
 :DATALOG:INTerval
 :DATALOG:DURation

Parameter/Return parameter	IMAGe	Save as images.
	WAVEform	Save as waveforms.

Example :DATALOG:SAVe WAVEform
 Sets the save format to waveform.



:DATALOG:INTerval

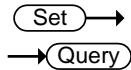
Description Sets or queries the recording interval time in seconds.

Syntax :DATALOG:INTerval {<NR1>[?]}

Related commands :DATALOG:STATE
 :DATALOG:SOURce
 :DATALOG:SAVe
 :DATALOG:DURation

Parameter/Return parameter <NR1> Sets returns the interval time in discrete seconds:
 2, 3, 4, 5, 10, 20, 30, 60, 120, 300, 600, 1200

Example :DATALOG:INTerval 2
 Sets the recording interval to 2 seconds.



:DATALOG:DURation

Description Sets or queries the recording duration time in minutes.

Syntax :DATALOG:DURation {<NR1>|?}

Related commands :DATALOG:STATE
 :DATALOG:SOURce
 :DATALOG:SAVe
 :DATALOG:INTerval

Parameter/Return parameter <NR1> Sets returns the duration time in discrete minutes:
 5, 10, 15, 20, 25, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330, 360, 390, 420, 450, 480, 510, 540, 570, 600, 1200, 1800, 2400, 3000, 3600, 4200, 4800, 5400, 6000

Example :DATALOG:DURation 10
 Sets the recording duration to 10 minutes.

APPENDX

Error messages

Description The following error messages may be returned from the :SYSTem:ERRor? query. For details see page 148.

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"
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