Compact Digital Storage Oscilloscope and Digital Multimeter

GDS-200 & GDS-300 Series

PROGRAMMING MANUAL

GW INSTEK PART NO. V1.01

ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

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The information in this manual was correct at the time of printing. However, Good Will continues to improve products and reserves the right to change specifications, equipment, and maintenance procedures at any time without notice.

Good Will Instrument Co., Ltd.
No. 7-1, Jhongsing Rd., Tucheng Dist., New Taipei City 236, Taiwan.

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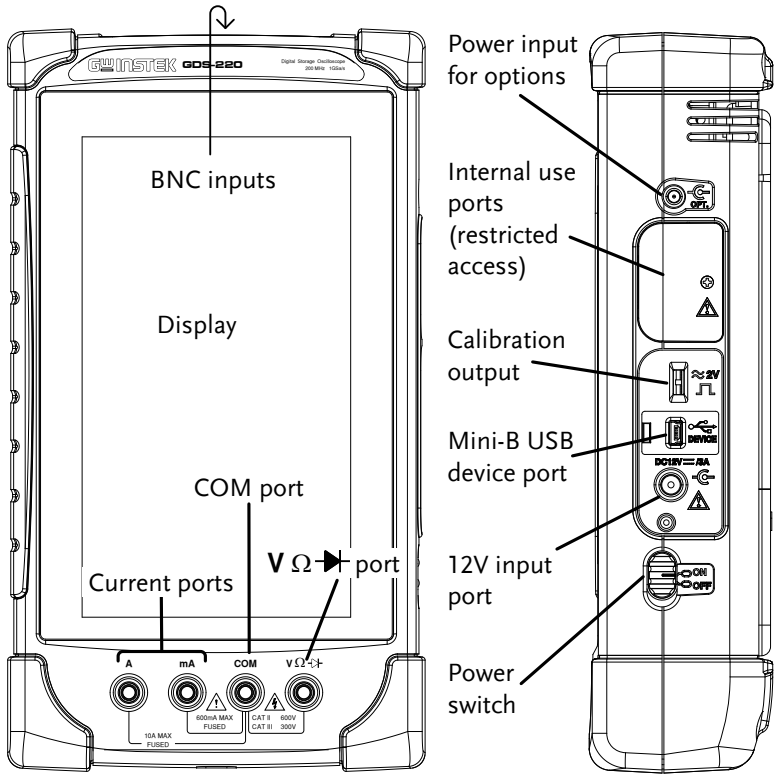
INTERFACE OVERVIEW

This manual describes how to use the remote command functionality and lists the command details. The Overview chapter describes how to configure the GDS-200/300 USB remote control interface.

Panel Overview



Interface Configuration

The GDS-200/300 uses the USB device port for remote control. When using the remote control function, the GDS-200/300 acts as a virtual COM port (VCP).

Note

New drivers can be downloaded from the GW Instek website, www.gwinstek.com.

Configure USB Interface

Configuration	PC side connection GDS side connection	Type A, host port Type Mini-B, device port

Background

The GDS's USB device port needs to be configured to the "Communication" mode to enable the remote connection.

Configuration

1. Connect the PC to the GDS-200/300 using the supplied USB-A to USB Mini-B cable.
2. From the Drop Down menu press the Utility icon>USB device port and select Communication.
3. 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. The driver automatically sets the GDS-200/300 as a virtual COM port.
4. The DSO should now be ready for remote control. See page 7 for the remote control function check.

Remote Control Function Check

Functionality check	Invoke a terminal application such as Realterm. In the terminal program, set the COM port, baud rate, stop bit, data bit and parity to match the settings for the virtual COM port of the DSO. To check the COM settings of the DSO in Windows, see the Windows Device Manager. For example, in WinXP go to the Control panel → System → Hardware tab.
⚠ Note	If you are not familiar with using a terminal application to send/receive remote commands, please page 8 (Using Realterm to Establish a Remote Connection) for more information.
	Run this query command via the terminal after the instrument has been configured for USB remote control (page 6). *idn? This should return the Manufacturer, Model number, Serial number, and Firmware version in the following format. GW,GDS-310, XXXXXXX, VX.XX

Using Realterm to Establish a Remote Connection

Background

Realterm is a terminal program that can be used to communicate with a device attached to the serial port of a PC or via an emulated serial port via USB.

The following instructions apply to version 2.0.0.70. Even though Realterm is used as an example to establish a remote connection, any terminal program can be used that has similar functionality.

Note

Realterm can be downloaded on Sourceforge.net free of charge.

For more information please see http://realterm.sourceforge.net/

Operation

1. Download Realterm and install according to the instructions on the Realterm website.

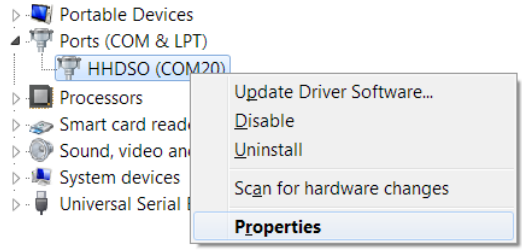
2. Connect the GDS-200/300 via USB to a PC and configure for remote control connection (page 6).

3. Make note of the baud rate, stop bits and parity of the VCP driver.

   Go to the Windows device manager and find the COM port number for the connection. For example, go to the Start menu > Control Panel > Device Manager

   Double click the *Ports* icon to reveal the connected serial port devices and the COM port for the each connected device.

The baud rate, stop bit and parity settings can be viewed by right-clicking connected device and selecting the *Properties* option.



4. Start Realterm on the PC as an administrator. Click:
   Start menu>All Programs>RealTerm>realterm

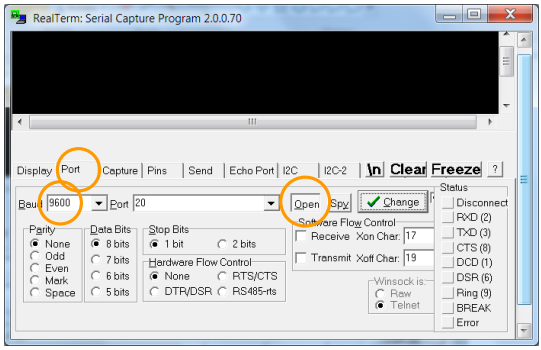
   Tip: to run as an administrator, you can right click the Realterm icon in the Windows Start menu and select the *Run as Administrator* option.

5. After Realterm has started, click on the *Port* tab.

   Enter the *Baud, Parity, Data bits, Stop bits* and *Port* number configuration for the connection.

   The *Hardware Flow Control* and *Software Flow Control* options can be left at the default settings.

   Press *Open* to connect to the GDS-200/300.

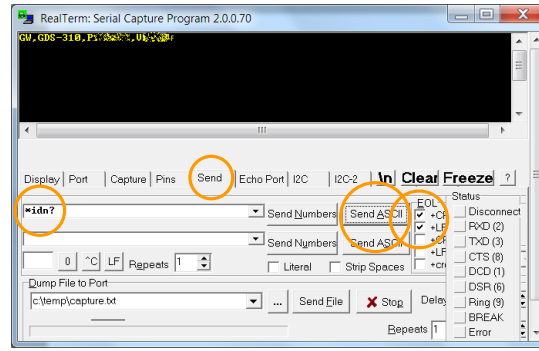


6. Click on the *Send* tab.

   In the *EOL* configuration, check on the *+CR* and *+LF* check boxes.

   Enter the query:
   **idn?*

   Click on *Send ASCII*.



7. The terminal display will return the following:

   GW, GDS-310, XXXXXXX,VX.XX

   (manufacturer, model, serial number, version)

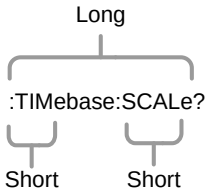
8. If Realterm fails to connect to the unit, please check all the cables and settings and try again.

COMMAND OVERVIEW

The Command overview chapter gives an overview of the command syntax, basic syntax rules and lists all GDS-200/300 commands.

Command Syntax

Compatible standard	• USB CDC_ACM compatible • SCPI, 1994 (partially compatible)
Command forms	Commands and queries have two different forms, long and short. The command syntax is written with the short form of the command in capitals and the remainder (long form) in lower case.



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

Below are examples of correctly written commands.

LONG	:TIMebase:SCALe?	:TIMEBASE:SCALE?
	:timebase:scale?	
SHORT	:TIM:SCAL?	:TIM:SCAL?

Command format :TIMebase:SCALe <NR3>LF

1: command header
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

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 page14.

Common Commands

*CLS

Set →

Description	Clears the error queue.
Syntax	*CLS

*ESE

Set →
→ Query

Description	Sets or queries the Standard Event Status Enable register.
Syntax	*ESE {<NR1> | ?}
Parameter/ Return parameter	<NR1> 0~255

Bit Weight

Bit#	Weight	Event	Description
0	1	OPC	Operation Complete Bit
1	2	RQC	Not used
2	4	QYE	Query Error

3	8	DDE	Device Error
4	16	EXE	Execution Error
5	32	CME	Command Error
6	64	URQ	User Request
7	128	PON	Power On

Example

*ESE?

>4

Indicates that there is a query error.

*ESR

→ Query

Description

Queries the Standard Event Status (Event) register. The Event Status register is cleared after it is read.

Syntax

*ESR?

Return Parameter

<NR1> 0~255

Bit Weight

Bit#	Weight	Event	Description
0	1	OPC	Operation Complete Bit
1	2	RQC	Not used
2	4	QYE	Query Error
3	8	DDE	Device Error
4	16	EXE	Execution Error
5	32	CME	Command Error
6	64	URQ	User Request
7	128	PON	Power On

Example

*ESR?

>4

Indicates that there is a query error.

*IDN? → Query

Description	Returns the manufacturer, model, serial number and version number of the unit.
Syntax	*IDN?
Example	*IDN? GW,GDS-310,PXXXXXX,VX.XX

*LRN? → Query

Description	Returns the oscilloscope settings as a data string.
Syntax	*LRN?
Example	*LRN? :DISPlay:WAVEform VECTOR;PERSistence Short;INTensity:WAVEform 50;INTensity:GRATicule 50;GRATicule FULL;BRIGHTness 80;:ECO ON;:ECO:TIMe 1;:CHANnel CH1:DISPlay ON;BWLimit OFF;COUPling DC;INVert OFF;POSition 3.600E+00;PROBe:RATio 1.000e+00;PROBe:TYPe VOLTAGE;SCALe 2.000E+00;EXPand GROUND;:CHANnel CH2:DISPlay ON;BWLimit OFF;COUPling DC;INVert OFF;POSition -4.000E+00;PROBe:RATio 1.000e+00;PROBe:TYPe VOLTAGE;SCALe 2.000E+00;EXPand GROUND;:MATH:TYPe DUAL;DISP OFF;DUAL:SOURce1 CH1;SOURce2 CH2;OPERator PLUS;POSition 0.000E+00; SCALe ;FFT:SOURce CH1;MAG DB;WINDow HANNING;POSition 0.000E+00;SCALe ?;:TIMebase:MODe MAIN;SCALe 5.000E-04;POSition -1.150E-04;WINDow:SCALe 5.000E-06;:MEASure:GATingSCREEN;SOURce1 CH1;SOURce2 CH2;:ACQuire:MODe SAMPE;AVERage 4;:CURSor:SOURce CH2;MODeOFF;H1Position ;H2Position ;V1Position ;V2Position ;: HARDcopy:MODe SAVE;SAVEFORMat PNG;ASSIGN IMAGE;:TRIGger:FREQuency 2.000E+00;TYPe EDGE;SOURce CH2;COUPle DC;NREJ OFF;REJect OFF;MODe AUTO;HOLDoff 1.000e-08;LEVel 4.000E-01;EDGe:SLOP RISE;PULSEWidth:POLarity POSITIVE;VIDeo:TYPe NTSC;VIDeo:FIELd FIELD1;VIDeo:LINe 1;VIDeo:POLarity NEGATIVE;PULSe:WHEn LESSTHAN;PULSe:TIME 0.000;ALTernate OFF;:REF1:DISPlay OFF;OFFSet ;SCALe ;TIMebase:POSition ;SCALe ;:REF2:DISPlay OFF;OFFSet -8.000E-01;SCALe 2.000E+00;TIMebase:POSition 0.000E+00;SCALe 5.000E-07;:ROTATELANDscape(1); REPLAY:TOTalnum3000;:REPLAY:CURRent3000; :DMM:Mode:DCV; :Value:0.000;:Max Value:0.000;:Min Value:-0.003;:Hold:ON;:BRIEF:MODe ON;DATE OFF; VERTicalOFF;

	HORizontal OFF;TRIGger OFF;MEASUrement OFF;CURSor OFF;CURSor:MEASure OFF;:BUZZER OFF

*OPC

Set → / → Query

Description	The *OPC command sets the OPC bit (bit0) of the Standard Event Status Register when all current commands have been processed. The *OPC? Query returns 1 when all the outstanding commands have completed.
Syntax	*OPC, *OPC?
Return parameter	1 Returns 1 when all the outstanding commands have completed.
Example	*OPC? >1

*RCL

Set →

Description	Recalls a panel setup.
Syntax	*RCL {1 | 2 | 3 |.... | 20}
Example	*RCL 1 Recalls the setup from Set 1.

*RST

Set →

Description	Resets the GDS-200/300 (recalls the default panel settings).
Syntax	*RST

*SAV

Set →

Description	Saves the current panel setup to the selected setup number file number.
Syntax	*SAV {1 | 2 | 3 |.... | 20}

Example	*SAV 1 Saves the current setup to Set 1.

*SRE

Set → / → Query

Description	Sets or queries the Service Request Enable register. The Service Request Enable register determines which registers of the Status Byte register are able to generate service requests.
Syntax	*SRE {<NR1> | ?}
Parameter/ Return parameter	<NR1> 0~255

Bit Weight

Bit#	Weight	Event	Description
0	1		Not used
1	2		Not used
2	4		Not used
3	8		Not used
4	16	MAV	Message Available Bit
5	32	ESB	Event Status Bit
6	64	MSS	Master Summary Bit
6	64	RQS	Request Service Bit
7	128		Not used

Example	*SRE? >48 Indicates that the MAVB and ESB bit are both set.

*STB

→ Query

Description	Queries the bit sum of the Status Byte register with MSS (Master summary Status).

Syntax	*STB?			
Return Parameter	<NR1>	0~255		
Bit Weight	Bit#	Weight	Event	Description
	0	1		Not used
	1	2		Not used
	2	4		Not used
	3	8		Not used
	4	16	MAV	Message Available Bit
	5	32	ESB	Event Status Bit
	6	64	MSS	Master Summary Bit
	6	64	RQS	Request Service Bit
	7	128		Not used
Example	*STB?			
	>16			
	Indicates that the MAV bit is set.			

Acquisition Commands

: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 2)
Example	:ACQuire1:MEMory? Format,0.20;Memory Length, 10000;IntpDistance,0;Trigger Address,5229;Trigger Level,4.000E-01;Source,CH1;Vertical Units,V; Vertical Units Div,0;Vertical Units Extend Div,15; Label, ;Probe Type,0;Probe Ratio,1.000e+00;Vertical Scale,2.000e+00;Vertical Position,3.600e-00;Horizontal Units,S;Horizontal Scale,5.000E-04;Horizontal Position,0.000E+00; Horizontal Mode,Main;SincET Mode,Real Time;Sampling Period,4.000e-07;Horizontal Old Scale,5.000E-04;Horizontal Old Position,0.000E+00; Firmware,V0.42;Time,05-May-14 12:25:17; Waveform Data;<LF>#520000 <Raw Data><LF>

:ACQuire<X>:STATe? → Query

Description	Returns the status of waveform data.
Syntax	:ACQuire<X>:STATe?

Parameter	<X>	Channel number (1 to 2)
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.	

:ACQuire:INTERpolation

Set → / → 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.	

:ACQuire:RECOrdlength

Set → / → Query

Description	Sets or queries the record length. Please see the user manual for full details.	
Syntax	:ACQuire:RECOrdlength {<NRf> | ?}	
Parameter/Return parameter	<NRf>	1e+3, 1e+4, 1e+5, 1e+6, 5e+6 (GDS-300 only)
Example	:ACQuire:RECOrdlength?	
	1.000000e+04	
	The record length is currently set to 10000.	

:HEADer

Set → / → Query

Description	Configures whether the :ACQuire:MEM? query return data will contain header information or not. It is set to ON by default.
Syntax	:HEADer {OFF | ON | ?}
Related Commands	:ACQuire<X>:MEMory?
	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

:AUTOSet

Set →

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

:AUTORSET:MODe

Set →
→ Query

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:MODE? FITSCREEN	

Vertical Commands

:CHANnel<X>:BWLimit

Set → / → Query

Description	Sets or returns the bandwidth limit (20MHz) on/off.	
Syntax	:CHANnel<X>:BWLimit {OFF | ON | ?}	
Parameter	<X>	Specified channel 1,2
	ON	Bandwidth limit is on.
	OFF	Bandwidth limit is off.
Return parameter	Returns the bandwidth limit status for the selected channel.	
Example	:CHANnel1:BWLimit ON Sets the channel 1 bandwidth limit on.	

:CHANnel<X>:COUPling

Set → / → Query

Description	Selects or returns the coupling mode.	
Syntax	CHANnel<X>:COUPling {AC | DC | GND | ?}	
Parameter	<X>	Channel 1,2
	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>:DISPlay

Set → Query

Description	Turns a channel on/off or returns its status.	
Syntax	:CHANnel<X>:DISPlay {OFF | ON | ?}	
Parameter	<X>	Channel 1,2
	OFF	Channel off
	ON	Channel on
Return Parameter	Returns the status of the channel.	
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
	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>:INVert

Set → / → Query

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

:CHANnel<X>:POSition

Set → / → Query

Description	Sets or returns the position level for a channel.	
Note	The vertical position will only be set to the 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>	Specifies channel number (1, 2)
	<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
	<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
	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	Sets or returns the vertical scale. The scale depends on the probe attenuation factor. Note the probe attenuation factor should be set before the scale.

Syntax	:CHANnel<X>:SCALe { <NRf> | ?}	
Parameter	<X>	Channel 1, 2
	<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

:MATH:DISP

Set → / → Query

Description	Turns the math waveform on or off on the screen.	
Syntax	:MATH:DISP {OFF|ON|?}	
Related commands	:MATH:TYPe	
Parameter/ Return parameter	OFF	Math waveform is not displayed
	ON	Math waveform is displayed on screen
Example	:MATH:DISP OFF Turn the Math waveform off.	

:MATH:TYPe

Set → / → Query

Description	Queries or sets the Math type to FFT or to dual channel math operations
Syntax	:MATH:TYPe { DUAL | FFT | ? }

Related Commands	:MATH:DISP	
Parameter/ Return parameter	DUAL	Dual channel operations
	FFT	FFT operations
Example	:MATH:TYPe DUAL Sets the Math type to dual channel math operation.	

:MATH:DUAL:SOURce<X>

Set → Query

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

:MATH:DUAL:OPERator

Set → Query

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

Set → / → Query

Description	Sets the vertical position of the displayed math result expressed by unit/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

Set → / → Query

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.	

:MATH:FFT:SOURce

Set → / → Query

Description	Sets or queries the FFT math source.	
Syntax	:MATH:FFT:SOURce { CH1 | CH2 | REF1 | REF2 | ? }	
Parameter	CH1~2	Channel 1 to 2
	REF1~2	Reference waveform 1 to 2
Return parameter	Returns the FFT source.	
Example	:MATH:FFT:SOURce CH1 Sets the FFT math source as channel 1.	

:MATH:FFT:MAG

Set →
→ Query

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

:MATH:FFT:WINDow

Set →
→ Query

Description	Sets the windowing filter used for the FFT function.	
Syntax	:MATH:FFT:WINDow {RECTangular|HAMming|HANning|BLAckman|?}	
Parameter	RECTangular	Rectangular window
	HAMming	Hamming window
	HANning	Hanning window
	BLAckman	Blackman window
Return parameter	Returns the FFT window.	
Example	:MATH:FFT:WINDow HAMming Sets the FFT window filter to hamming.	

:MATH:FFT:POSition

Set →
→ 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.	

:MATH:FFT:SCALe

Set / 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+ (2mV~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 horizontal scaling factor for FFT math.	
Syntax	:MATH:FFT:HORizonatal:SCALe {<NRf> | ?}	
Parameter	<NRf>	Scale: 1, 2, 5, 10, 20 times
Return parameter	<NR3>	Returns the scaling factor.
Example	:MATH:FFT:HORizontal:SCALe 5 Scales the FFT waveform 5X.	

:MATH:FFT:HORizontal:POSition

Set / Query

Description	Sets or queries the FFT horizontal position.	
Syntax	:MATH:FFT:HORizonatal:POSition {<NRf> | ?}	
Parameter	<NRf>	FFT window position
Return parameter	<NR3>	Returns the zoom scale.

Example :MATH:FFT:HORizontal:POSition 6e+5

Sets the horizontal position to 60kHz.

Cursor Commands

:CURSor:MODe

Set →
→ Query

Description	Sets cursor mode to horizontal or horizontal and vertical (Combined cursor).	
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.	

:CURSor:SOURce

Set → / → Query

Description	Sets or queries the cursor source.	
Syntax	:CURSor:SOURce {CH1 | CH2 | REF1 | REF2 | MATH | | ?}	
Parameter	CH1~CH2	Channel 1 to 2
	REF1~2	Reference waveform 1 to 2
	MATH	Math source
Return parameter	Returns the cursor source.	
Example	:CURSor:SOURce CH1 Turns the cursor source as channel 1.	

:CURSor:HUNI

Set → / → Query

Description	Sets or queries the units for the horizontal bar cursors.	
Syntax	:CURSor:HUNI {SEConds | HERtz | ?}	
Related Commands	:CURSor:MODe	
Parameter	SEConds	Sets the cursor units to time in seconds.
	HERtz	Sets the cursor units to frequency.
Return parameter	Returns the unit type.	
Example	:CURSor:HUNI SEConds Sets the units to time in seconds.	

:CURSor:DDT → Query

Description	Returns the deltaY/deltaT (dY/dT) readout.
Note	Only supports CH1~CH2, REF1~REF2 & Math.
Syntax	:CURSor:DDT?
Related Commands	:CURSor:MODe
Return Parameter	<NR3> Returns the readout in <NR3> format.
Example	:CURSor:DDT? 4.00E-05

:CURSor:H1Position → Set / → Query

Description	Sets or returns the first horizontal cursor (H1) position.
Syntax	:CURSor:H1Position {<NRf>| ?}
Related Commands	:CURSor:H2Position
Parameter	<NRf> Horizontal position
Return parameter	Returns the cursor position.
Example	:CURSor:H1Position? -1.34E-3 Returns the H1 cursor position as -1.34ms.

:CURSor:H2Position → Set / → Query

Description	Sets or returns the second horizontal cursor (H2) position.
Syntax	:CURSor:H2Position {<NRf> | ?}
Related Commands	:CURSor:H1Position

Parameter	<NRf>	Horizontal Position
Return parameter	Returns the cursor position.	
Example	:CURSor:H2Position 1.5E-3 Sets the H2 cursor position to 1.5ms.	

:CURSor:HDELta

Query

Description	Returns the delta of H1 and H2.	
Syntax	:CURSor:HDELta?	
Return Parameter	<NR3>	Returns the distance between two horizontal cursors.
Example	:CURSor:HDELta? 5.0E-9 Returns the horizontal delta as 5ns.	

:CURSor:V1Position

Set

Query

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 160mV.	

:CURSor:V2Position

Set

Query

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 110mV.	

:CURSor:VDELta → Query

Description	Returns the delta of V1 and V2.	
Syntax	:CURSor:VDELta?	
Return Parameter	<NR3>	Returns the difference between two vertical cursors.
Example	:CURSor:VDELta? 4.00E+0 Returns the vertical delta as 4 volts.	

:CURSor:XY:RECTangular:X:POSition<X> → 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	<X>	Cursor 1, 2
	<NRf>	Horizontal position co-ordinates
Return parameter	<NR3>	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	<NR3>	Returns the delta value of cursor 1 and 2 as <NR3>.
Example	:CURSor:XY:RECTangular:X:DELta?	
	80.0E-3	
	Returns the horizontal delta as 80mV.	

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

Set → / → Query

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

:CURSor:XY:RECTangular:Y:DELta

→ Query

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

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

Description	Queries the polar radius position for the specified cursor in XY mode, where X can be either cursor 1 or 2.	
Syntax	:CURSor:XY:POLar:RADIUS:POSition<X>?	
Parameter	<X>	1, 2 (cursor 1, cursor 2)
Return Parameter	<NR3>	Returns the polar radius position.
Example	:CURSor:XY:POLar:RADIUS:POSition? 80.0E-3 Returns the polar radius position as 80.0mV.	

:CURSor:XY:POLar:RADIUS:DELta → 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:THETA: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

: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%.	

:DISPlay:INTensity:GRATicule

Set → / → Query

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

:DISPlay:PERSistence

Set → / → Query

Description	Sets or queries the waveform persistence level.	
Syntax	:DISPlay:PERSistence { INFInite | SHORT | MEDium | LONG | OFF| ? }	
Parameter	INFInite	Infinite persistence
	SHORT	Shortest persistence time
	MEDium	Medium persistence
	LONG	Long persistence
	OFF	No persistence
Return Parameter	Returns the persistence setting.	
Example	:DISPlay:PERSistence LONG Sets the persistence the longest time.	

:DISPlay:GRATicule

Set → / → Query

Description	Sets or queries graticule display type.			
Syntax	:DISPlay:GRATicule {FULL | GRID|CROSs | FRAMe | ?}			
Parameter	FULL		CROSs	
	FRAMe		GRID	
Return parameter	Returns the graticule type.			
Example	:DISPlay:GRATicule FULL Sets the graticule to  .			

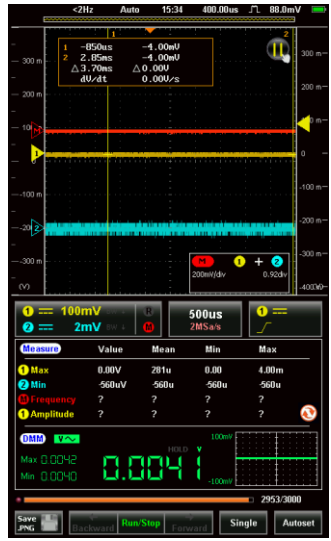
:DISPlay:WAVEform

Set → / → Query

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.	

:DISPlay:OUTPut → Query

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.
Example Image (Image extracted using Labview)	

:DISPlay:BRIGHTness

Set → / → Query

Description	Sets or queries the screen brightness.	
Syntax	:DISPlay:BRIGHTness {<NRf> | ? }	
Parameter	<NRf>	0.0E+0 to 1.0E+2 (0% to 100%)
Return Parameter	<NR3>	Returns the brightness.
Example	:DISPlay:BRIGHTness 100 Sets the brightness to 100%.	

:DISPlay:ECO

Set → / → Query

Description	Sets or queries ECO mode status.	
Syntax	:DISPlay:ECO {ON | OFF| ?}	
Parameter	ON	Turns on the ECO mode.
	OFF	Turns off the ECO mode.
Return parameter	Returns ON or OFF	
Example	:DISPlay:ECO ON Turns the ECO mode on.	

:DISPlay:ECO:TIMe

Set → / → Query

Description	Sets or queries ECO time setting. The ECO mode dims the display after a set amount of time.	
Syntax	:DISPlay:ECO:TIMe {<NRf>| ?}	
Parameter	<NRf>	1, 2, 5, 10, 30 minutes
Return parameter	<NR3>	Returns the ECO time
Example	:DISPlay:ECO:TIMe 10 Sets the ECO mode to minutes.	

Hardcopy Commands

:HARDcopy:START

Set →

Description	Executing the HARDcopy:START command is the equivalent of pressing the Save hardcopy key on the screen.
Syntax	:HARDcopy:START
Related Commands	:HARDcopy:ASSIGN

:HARDcopy:ASSIGN

Set →
→ Query

Description	Sets or queries what file type the Save hardcopy key has been assigned to save.	
Syntax	:HARDcopy:ASSIGN {IMAGe | WAVEform | SETUp | ALL | ?}	
Related Commands	:HARDcopy:START	
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

: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 | ? }	
Parameter	<X>	Source1 or source2
	CH1~CH2	Channel 1 to 2
	MATH	Math
Return parameter	Returns the source (CH1, CH2)	
Example	:MEASure:SOURce1 CH1 Sets source1 to channel 1.	

: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:MAX → Query

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

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

:MEASure:MIN → Query

Description	Returns the minimum amplitude.	
Syntax	:MEASure:MIN?	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the minimum amplitude.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	:MEASure:SOURce1 CH1 :MEASure:MIN? -8.00E-3 Selects Channel 1, and then measures the minimum amplitude.	

:MEASure: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:HIGH → Query

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	:MEASure:SOURce1 CH1 :MEASure:HIGH? 3.68E-3 Selects Channel 1, and then measures the high voltage/current.	

:MEASure:LOW → Query

Description	Returns the low voltage/current.
Syntax	:MEASure:LOW?

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

: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	:MEASure:SOURce1 CH1 :MEASure:CMEan? 9.480E-01 Selects Channel 1, and then measures the mean value of the first period.	

: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:CRMS → Query

Description	Returns the root-mean-square voltage/current of one full period.	
Syntax	:MEASure:CRMS?	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the CRMS 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 CRMS 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 → Query

Description	Returns the voltage/current area over one full period.	
Syntax	:MEASure:CAREa?	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the area value.
	Chan Off	Indicates the source channel is not activated.
Note	Before using this command, select the measurement channel. See the example below.	
Example	:MEASure:SOURce1 CH1 :MEASure:CAREa? 1.958E-03 Selects Channel 1, and then measures the area.	

:MEASure: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:FOVShoot

→ Query

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

:MEASure: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	:MEASure:SOURce1 CH1 :MEASure:RPReshoot? 2.13E-2 Selects Channel 1, and then measures the rise preshoot.	

: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:PERiod → Query

Description	Returns the period.	
Syntax	:MEASure:PERiod?	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the period.
	Chan Off	Indicates the source channel is not activated.

Note	Before using this command, select the measurement channel. See the example below.
Example	:MEASure:SOURce1 CH1 :MEASure:PERiod? 1.0E-3 Selects Channel 1, and then measures the period.

:MEASure: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:FALL → Query

Description	Returns the fall time measurement result.	
Syntax	:MEASure:FALL?	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	
	Chan Off	Indicates the source channel is not activated.

Note	Before using this command, select the measurement channel. See the example below.
Example	:MEASure:SOURce1 CH1 :MEASure:FALL? Selects Channel 1 as the source, and then measures the fall time.

:MEASure: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: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:PPULSE → Query

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	:MEASure:SOURce1 CH1 :MEASure:PPULSE? 6.000E+00 Selects Channel 1, and then measures the number of positive pulses.	

: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	:MEASure:SOURce1 CH1 :MEASure:NPULSE? 4.000E+00 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: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	:MEASure:SOURce1 CH1 :MEASure:SOURce2 CH2 :MEASure:FRRDelay? -4.68E-6 Select channel 1 and 2 as source1/2, and then measure FRR.	

:MEASure:FRFDelay → Query

Description	Returns the delay between the first rising edge of source1 and the first falling edge of source2.
Syntax	:MEASure:FRFDelay?

Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.
Note	Select the two source channels before entering this command.	
Example	:MEASure:SOURce1 CH1 :MEASure:SOURce2 CH2 :MEASure:FRFDelay? 3.43E-6 Select channel 1 and 2 as source1/2, and then measure FRF.	

:MEASure:FFRDelay → Query

Description	Returns the delay between the first falling edge of source1 and the first rising edge of source2.	
Syntax	:MEASure:FRRDelay?	
Related Commands	:MEASure:SOURce<X>	
Return parameter	<NR3>	Returns the delay.
	Chan Off	Indicates the source channel is not activated.
Note	Select the two source channels before entering this command.	
Example	:MEASure:SOURce1 CH1 :MEASure:SOURce2 CH2 :MEASure:FRRDelay? -8.56E-6 Select channel 1 and 2 as delay source1/2, and then measure FFR.	

:MEASure:FFFDelay → Query

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

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

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

Set → / → Query

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 | MATH | ? }	
Related commands	:MEASUrement:MEAS<X>:TYPe	
Parameter	MEAS<X>	The automatic measurement number from 1 to 4.
	SOURCE<X>	SOURCE1: Source#1 for all single channel measurements.
	SOURCE<X>	SOURCE2: Source#2 for all delay or phase measurements.
	CH1 to CH2	Channel 1, 2
	MATH	Math source
Return parameter	CH1 to CH2	Channel 1, 2
	MATH	Math source

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

:MEASUrement:MEAS<X>:TYPe

Set → / → Query

Description	Sets or queries the measurement type for a selected automatic measurement. This is a statistics related command.
Syntax	:MEASUrement:MEAS<X>:TYPe {PK2pk | MAXimum | MINImum | AMPlitude | HIGH | LOW | MEAN | CMEan | RMS | CRMs | AREa | CAREa | ROVShoot | FOVShoot | RPReshoot | FPReshoot | FREQuency | PERIod | RISe | FALL | PWIdth | NWIdth | PDUTy | PPULSE | NPULSE | PEDGE | NEDGE | FRRDelay | FRFDelay | FFRDelay | FFFDelay | LRRDelay | LRFDelay | LFRDelay | LFFDelay | PHAse | ?}
Related commands	:MEASUrement:MEAS<X>:SOURCE<X>
Parameter	MEAS<X> The automatic measurement number from 1 to 4.
Return parameter	Returns the measurement type
Example	:MEASUrement:MEAS1:TYPe RMS Sets measurement 1 to RMS measurement.

: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> :MEASUrement:MEAS<x>:TYPe

Return parameter	MEAS<X>	The automatic measurement number from 1 to 4.
Note	The measurement source(s), measurement number and measurement type must first be set before a measurement result can be returned.	
Example	:MEASUrement:MEAS1:SOUrce1 CH1 :MEASUrement:MEAS1:TYPe PK2PK :MEASUrement:MEAS1:VALue? 5.000E+0 Selects channel 1 as the source for measurement 1 and sets measurement 1 to peak to peak 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 4.
Example	:MEASUrement:MEAS3:SOUrce1 CH1 :MEASUrement:MEAS3:TYPe PK2PK :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 4.
Example	:MEASUrement:MEAS3:SOUrce1 CH1 :MEASUrement:MEAS3:TYPe PK2PK :MEASUrement:STATIstics:MODe ON :MEASUrement:MEAS3:MEAN? 2.090E-02 Returns the mean measurement result for measurement number 3.	

:MEASUrement:MEAS<X>:MINImum → 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>:MINImum?	
Related Commands	:MEASUrement:STATIstics:MODe	
Parameter	MEAS<X>	The automatic measurement number from 1 to 4.

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

:MEASUrement:STATIstics:MODe

Set → / → Query

Description	Puts the statics measurement results on the display or queries whether the statistics are displayed. This is the equivalent of showing the automatic measurements in the expanded mode (statistics mode on) condensed mode (statistics mode off).	
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

Set →

Description	Resets the statics calculations. This command will clear all the currently accumulated measurements.
Syntax	:MEASUrement:STATIstics {RESET}

:MEASUrement:DISPlay

Set → / → Query

Description	Sets or returns the display status of the automatic measurements.	
Syntax	:MEASUrement:DISPlay {OFF | ON | ?}	
Related commands	MEAS<x>:SOUrce<x> :MEASUrement:MEAS<x>:TYPe	
Parameter/ Return parameter	ON	Measurements are displayed on the screen.
	OFF	Measuremetns are not displayed on the screen.
Example	:MEASUrement:DISPlay ON Displays measurements on the screen.	

Reference Commands

: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
	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
	<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.	

:REF<X>:TIMebase:SCALe

Set → / → Query

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
	<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.	

:REF<X>:OFFSet

Set → / → Query

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
	<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

Set → / → Query

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
	<NRf>	Vertical scale
Return parameter	<NR3>	Returns the reference waveform vertical scale.
Example	:REF1:SCALe 5.000E-4 Selects reference 1, and then sets the vertical scale to 500u /div.	

Run Command

:RUN

Set →

Description	The run command allows the oscilloscope to continuously make acquisitions, equivalent to toggling the scope to RUN mode (using the Run/Stop key on the LCD screen).
Syntax	:RUN

Stop Command

:STOP

Set →

Description	The stop command stops the oscilloscope making further acquisitions, equivalent to toggling the scope to STOP mode (using the Run/Stop key on the LCD screen).
Syntax	:STOP

Single Command

:SINGle

Set →

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 screen).
Syntax	:SINGle

Force Command

:FORCe

Set →

Description	The Force command forces an acquisition (equivalent to pressing the Force-Trigger key in Trigger menu).
Syntax	:FORCe

Utility Commands

:BUZZER

Set → / → Query

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.	

:DATe

Set →

Description	Sets the system date and time.	
Syntax	:DATe {string}	
Parameter	{string}	"YYYYMMDDhhmm" Where: YYYY: year MM: month DD: day hh: hour mm: minute
Example	:date "201405021428" Sets the time and date as: Year: 2014, Month: 05, Day: 02, Hour: 14 (2PM), Minute: 28.	

Timebase Commands

:TIMebase:POSition

Set →
→ Query

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.	

:TIMebase:SCALe

Set →
→ 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.	

:TIMebase:MODe

Set → / → 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.	

:TIMebase:WINDow:POSition

Set → / → 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-2 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 1.0E-3 Sets the zoom horizontal scale to 1ms.	

:TIMebase:EXPand

Set → / → Query

Description	Sets or queries the horizontal expand mode.	
Syntax	:TIMebase:EXPand { CENTer | TRIGger | ? }	
Parameter	CENTer	Sets the horizontal expand mode by center.
	TRIGger	Sets the horizontal expand mode by the trigger position.
Return parameter	Sets the horizontal expand mode (CENTER, TRIGGER).	
Example	:TIMebase:EXPand TRIGger Sets the horizontal expansion from the trigger position.	

Trigger Commands

:TRIGger:FREQuency → Query

Description	Queries the trigger frequency.	
Syntax	:TRIGger:FREQuency?	
Return parameter	<NR3>	Returns the trigger frequency.
Example	:TRIGger:FREQuency? 1.032E+3 Returns the trigger frequency.	

:TRIGger:TYPe

Set / Query

Description	Sets or queries the trigger type.	
Syntax	:TRIGger:TYPe {EDGe | PULSEWidth | VIDeo | ? }	
Parameter	EDGE	Edge trigger
	PULSEWidth	Pulse width trigger
	VIDeo	Video trigger
Return parameter	Returns the trigger type.	
Example	:TRIGger:TYPe EDGE Sets the trigger type to edge.	

:TRIGger:SOURce

Set / Query

Description	Sets or queries the trigger source.	
Syntax	:TRIGger:SOURce { CH1 | CH2 | ? }	
Parameter	CH1 to CH2	Channel 1 to channel 2
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 pulse width 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.

:TRIGger:NREJ

Set → Query

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.	

:TRIGger:REJect

Set → Query

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.	

:TRIGger:MODe

Set → Query

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.

:TRIGger:HOLDoff

Set → Query

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.	

:TRIGger:LEVel

Set → Query

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 50%
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:EDGe:SLOP

Set / Query

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:PULSEWidth:POLarity

Set / Query

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:VIDeo:TYPe

Set / Query

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.	

:TRIGger:VIDeo:FIELd

Set → / → Query

Description	Sets or queries the video trigger field.
Syntax	:TRIGger:VIDeo:FIELd { FIELD1 | FIELD2 | ALLFields | ALLLines | ? }
Related commands	:TRIGger:TYPe

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

Return parameter	Returns the video trigger field.
Example	:TRIGger:VIDeo:FIELd ALLFields Sets the video trigger to trigger on all fields.

:TRIGger:VIDeo:LINe

Set → / → Query

Description	Sets or queries the video trigger line.
Syntax	:TRIGger:VIDeo:LINe {<NR1> | ?}
Related commands	:TRIGger:TYPe

Parameter		
	<NR1>	Video line

Return parameter	<NR3>	Returns the video trigger line.
Example	:TRIGger:VIDeo:LINe 1 Sets the video trigger to line 1.	

:TRIGger:VIDeo:POLarity

Set → Query

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.	

:TRIGger:PULSe:WHEn

Set → Query

Description	Sets or queries the pulse width trigger conditions.	
Syntax	:TRIGger:PULSe:WHEn { MOREthan | LESSthan | EQual | UNEQual | ? }	
Related commands	:TRIGger:TYPe :TRIGger:PULSe:TIMe	
Parameter	MORE than	>
	LESSthan	<
	EQual	=
	UNEQual	≠
Return parameter	Returns the pulse width trigger conditions.	
Example	:TRIGger:PULSe:WHEn UNEQual Sets the trigger pulse width conditions to not equal to (≠).	

:TRIGger:PULSe:TIMe

Set → / → Query

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

Set → / → Query

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

→ Query

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.	

System Commands

:SYSTem:LOCK

Set
Query

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

Set
Query

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

Save/Recall Commands

:RECAll:SETUp

Set →

Description	Recalls setup settings from memory.
Syntax	:RECAll:SETUP {S1~S20 | <file path>("Disk:/xxx.SET"}
Parameter	S1~S20 Recall Set1~Set20

	<file path>	Recall a file from the DSO internal disk.
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:SETUp:NOTE

Set ⟶

Description	Writes a note/overwrites the text note that was previously saved from the last setup file.	
Syntax	:RECAll:SETUp:NOTE {<string>}	
Parameter	<string>	Max. 50 character string enclosed in double quotes.
Example	:RECAll:SETUp:NOTE “this is a note” “this is a note” becomes the note for the last saved setup note.	

:RECAll:WAVEform

Set ⟶

Description	Recalls a waveform from wave1~wave20 or from file to REF1~2	
Note	For *.CSV files, only record lengths of 1k or 10k points can be recalled. *.LSF files have no such limitation.	
Syntax	:RECAll:WAVEform {W<n> | <file path> (“Disk:/xxx.LSF”)},REF<X>	
Parameter	n	1~20 (Wave1~wave20)
	xxx.LSF	Filename in file path.
	<X>	1,2 (REF1, REF2)
Example	:RECAll:WAVEform W1, REF1 Recalls the waveform stored in Wave1 to reference 1.	

Example 2	:RECAll:WAVEform "Disk:/DS0005.CSV", REF1 Recalls the waveform from the DS0005.CSV file to reference 1.

:RECAll:WAVEform:NOTE

Set →

Description	Writes a note/overwrites the text note that was previously saved from the last waveform file.	
Syntax	:RECAll:WAVEform:NOTE {<string>}	
Parameter	<string>	Max. 50 character string enclosed in double quotes.
Example	:RECAll:WAVEform:NOTE “this is a note” “this is a note” becomes the note for the last saved waveform note.	

:SAVe:IMAGe

Set →

Description	Saves a screen image to the assigned file path with a specified filename.	
Syntax	:SAVe:IMAGe {<file path> (“Disk:/xxx.PNG”}	
Related commands	:SAVe:IMAGe:FILEFormat	
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:FILEFormat

Set → / → Query

Description	Sets the file format for image.
Syntax	:SAVe:IMAGe:FILEFormat {PNG | BMP | ?}

Related commands	:SAVe:IMAGe	
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:NOTE

Set →

Description	When an image file is saved, this command saves a note (*.TXT) with the same base filename as the image file that was saved.	
Syntax	:SAVE:IMAGe:NOTE {<string>}	
Parameter	<string>	Max. 50 character string enclosed in double quotes.
Example	:SAVE:IMAGe:NOTE “This is a note.” Saves the note the next time an image is saved and the brief mode is turned off.	

:SAVe:SETUp

Set →

Description	Saves the current setup to internal memory.	
Syntax	:SAVe:SETUp {<file path> (“Disk:/xxx.SET”) | S1~S20}	
Parameter	<file path>	Saves the setup file to the specified file path/file.
	S1~S20	Setup memory Set1 ~ Set 20
Example	:SAVe:SETUp S1 Saves the current setup to Set1 in internal memory. :SAVe:SETUp “Disk:/DS0001.SET” Saves the current setup to Disk:/DS0001.SET.	

:SAVe:SETUp:NOTE

Set →

Description	When a setup file is saved, this command saves a note (*.TXT) with the same base filename as the setup file that was saved.	
Syntax	:SAVe:SETUp:NOTE {<string>}	
Parameter	"String"	Max. 50 character string enclosed in double quotes.
Example	:SAVE:SETUp:NOTE "This is a note." Saves the note the next time an image is saved and the brief mode is turned on.	

:SAVe:WAVEform

Set →

Description	Saves a waveform to internal memory or to a designated file path.	
Related commands	:SAVe:WAVEform:FILEFormat	
Syntax	:SAVe:WAVEform {CH1~REF2, REF<X> } | {CH1~REF2, W1~W20} | {CH1~ALL, file path}	
Parameter	CH1~REF2,	CH1~CH2, Math, REF1~2
	<X>	1,2 (REF1, REF2)
	W1~W20	Wave1~Wave20
	ALL	All the displayed waveforms on screen.
	File path	Saves the waveform(s) to specified file path on the internal disk.
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.

:SAVe:WAVEform:FILEFormat

Set → / → Query

Description	Sets the waveform save file format.	
Syntax	:SAVe:WAVEform:FILEFormat {LSF | FCSV | ?}	
Parameter	LSF	Sets the file format to the internal file format, LSF. (xxx.LSF)
	FCSV	Sets the file format to fast CSV. (xxx.CSV)
Return parameter	Returns the file format (LSF, FCSV).	
Example	:SAVe:WAVEform:FILEFormat LSF Sets the file format to LSF.	

:SAVe:WAVEform:NOTE

Set →

Description	When a waveform is saved, this command saves a note (*.TXT) with the same base filename as the waveform that was saved.	
Syntax	:SAVE:WAVEform:NOTE {<string>}	
Parameter	<string>	Max. 50 character string enclosed in double quotes.
Example	:SAVE:WAVEform:NOTE “This is a note.” Saves the note the next time a waveform file is saved.	

:SAVe:ALL

Set →

Description	Saves all the displayed waveforms, reference and math waveforms, a screenshot of the display and the current setup to a designated file path on the internal disk.	
Related commands	:SAVe:ALL	
Syntax	:SAVe:ALL	
Parameter	<file path>	Saves the waveform(s) to specified file path on the internal disk.
Example 1	:SAVe:ALL “Disk:/ALL0001” Saves to a directory named ALL0001.	

:SAVe:ALL:NOTE

Set →

Description	When the SAVe:ALL command is used, this command saves a note (*.TXT) with the same base filename as the directory in which everything was saved.
Syntax	:SAVE:ALL:NOTE {<string>}

Parameter	<string>	Max. 50 character string enclosed in double quotes.
Example	:SAVE:ALL:NOTE “This is a note.” Saves the note the next time the SAVe:ALL command is used.	

:BRIEF:MODe

Set → / → Query

Description	Turns the brief mode on or off. This is only applicable when saving image files.	
Syntax	:BRIEF:MODe {ON | OFF | ?}	
Related commands	:SAVe:IMAGe	
Parameter/ Return parameter	ON	Turns Brief mode on
	OFF	Turns Brief mode off
Example	:BRIEF:MODe ON Turns brief mode on.	

:BRIEF:DATE

Set → / → Query

Description	Adds the time and date to the image file that is saved when Brief mode is on.	
Syntax	:BRIEF:DATE {ON | OFF | ?}	
Related commands	:SAVe:IMAGe	
Parameter/ Return parameter	ON	Adds date and time for Brief mode
	OFF	Turns off the date and time from Brief mode
Example	:BRIEF:DATE ON Adds the date and time to Brief mode.	

:BRIEF:VERTical

Set → / → Query

Description	Adds vertical information to the image file that is saved when Brief mode is on.	
Syntax	:BRIEF:VERTical {ON | OFF | ?}	
Related commands	:SAVe:IMAGe	
Parameter/ Return parameter	ON	Adds vertical information for Brief mode
	OFF	Turns off vertical information from Brief mode
Example	:BRIEF:VERTical ON Adds vertical information to Brief mode.	

:BRIEF:HORizontal

Set → / → Query

Description	Adds horizontal information to the image file that is saved when Brief mode is on.	
Syntax	:BRIEF:HORizontal {ON | OFF | ?}	
Related commands	:SAVe:IMAGe	
Parameter/ Return parameter	ON	Adds horizontal information for Brief mode
	OFF	Turns off horizontal information from Brief mode
Example	:BRIEF:HORizontal ON Adds horizontal information to Brief mode.	

:BRIEF:TRIGger

Set → / → Query

Description	Adds trigger information to the image file that is saved when Brief mode is on.
Syntax	:BRIEF:TRIGger {ON | OFF | ?}

Related commands	:SAVe:IMAGe	
Parameter/ Return parameter	ON	Adds trigger information for Brief mode
	OFF	Turns off trigger information from Brief mode
Example	:BRIEF:TRIGger ON Adds trigger information to Brief mode.	

:BRIEF:CURsor

Set → Query

Description	Adds cursors to the image file that is saved when Brief mode is on.	
Syntax	:BRIEF:CURSor {ON | OFF | ?}	
Related commands	:SAVe:IMAGe	
Parameter/ Return parameter	ON	Adds cursors for Brief mode
	OFF	Turns off cursors from Brief mode
Example	:BRIEF:CURSor ON Adds cursors to the image file for Brief mode.	

:BRIEF:CURsor:MEASure

Set → Query

Description	Adds cursor measurement information to the image file that is saved when Brief mode is on.	
Syntax	:BRIEF:CURSor:MEASure {ON | OFF | ?}	
Related commands	:SAVe:IMAGe	
Parameter/ Return parameter	ON	Adds cursor measurement information for Brief mode
	OFF	Turns off cursor measurement information from Brief mode

Example	:BRIEF:CURSor:MEASure ON Adds cursor measurements to the image file for Brief mode.

:BRIEF:MEASure

Set → / → Query

Description	Adds automatic measurement results to the image file that is saved when Brief mode is on.	
Syntax	:BRIEF:MEASure {ON | OFF | ?}	
Related commands	:SAVe:IMAGe	
Parameter/ Return parameter	ON	Adds automatic measurement results for Brief mode
	OFF	Turns off automatic measurement results from Brief mode
Example	:BRIEF:MEASure ON Adds automatic measurement results to the image file for Brief mode.	

:BRIEF:NOTE

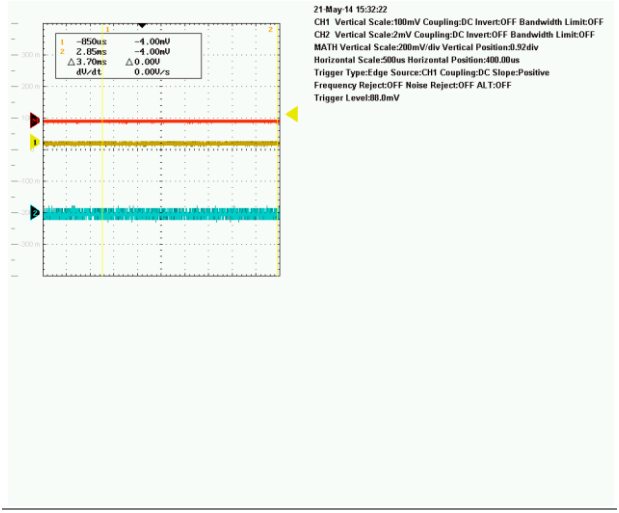
Set →

Description	Adds a note in an image file when an image file is saved and Brief mode is turned on.	
Syntax	:BRIEF:NOTE {<string>}	
Parameter	<string>	Max. 50 character string enclosed in double quotes.
Example	:BRIEF:NOTE “This is a note.” Adds the note when the image file is saved.	

:BRIEF:OUTPut

→ Query

Description	Returns the “Brief note” image as a 16 bit RGB run length encoded image.

Syntax	:BRIEF: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.
Example Image (Image extracted using Labview)	

Go_NoGo Commands

The GoNoGo function must be turned on(or use the command, ":GONogo:FUNCtion") before any of the Go_NoGo or Template commands can be used.

:GONogo:CLEar

Set →

Description	Clears the Go/NoGo counter.
Syntax	:GONogo:CLEar

:GONogo:EXECute

Set →
→ Query

Description	Executes the Go/NoGo function or queries its state.
Syntax	:GONogo:EXECute {OFF|ON|?}

Parameter/ Return Parameter	OFF	Pauses/Stops the test
	ON	Starts the test
Example	:GONogo:EXECute OFF Turns Go/NoGo off.	

:GONogo:FUNCtion

Set →

Description	Initializes the Go/NoGo function. This must be run before any Go/NoGo commands can be used.
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/ Return Parameter	EXITs	Sets the NoGo condition to when the input signal exceeds the limit boundary.
	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.	

:GONogo:SOURce

Set → / → Query

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

:GONogo:VIOLation

Set → / → Query

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.	

:GONogo:MODe

Set → / → Query

Description	Turns Go-NoGo on or off or returns its state.	
Syntax	:GONogo:MODe {OFF | ON | ? }	
Parameter/ Return Parameter	OFF	Turns Go-NoGo mode off
	ON	Turns Go- NoGo mode on
Example	:GONogo:MODe ON Turns Go-NoGo mode on.	

:TEMPlate:MODe

Set → / → Query

Description	Sets or returns the Go/NoGo template mode.	
Syntax	:TEMPlate:MODe {MAXimum|MINimum|AUTO|?}	
Parameter/ Return Parameter	MAXimum	Maximum template
	MINimum	Minimum template
	AUTO	Auto template
Example	:TEMPlate:MODe AUTO Sets the template mode to AUTO.	

:TEMPlate:MAXimum

Set → / → Query

Description	Defines or queries which waveform memory (REF1 or W1~W20) is set to the maximum template.	
Syntax	:TEMPlate:MAXimum {REF1|W1~W20|?}	
Parameter/ Return Parameter	REF1	Reference one
	W1~W20	Waveform memory 1 to 20
Example	:TEMPlate:MAXimum REF1 Saves the maximum template to REF1.	

:TEMPlate:MINimum

Set → / → Query

Description	Defines or queries which waveform memory (REF2 or W1~W20) is set to the minimum template.	
Syntax	:TEMPlate:MINimum {REF2|W1~W20|?}	
Parameter/ Return Parameter	REF2	Reference one
	W1~W20	Waveform memory 1 to 20
Example	:TEMPlate:MINimum REF2 Saves the minimum template to REF2.	

:TEMPlate:POSition:MAXimum

Set → / → 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.	

:TEMPlate:POSition:MINimum

Set → / → Query

Description	Sets or queries the position of the minimum template.	
Syntax	:TEMPlate:POSition:MINimum {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

Replay Commands

The replay function automatically logs acquisitions when the scope is in Run mode.

:REPLAY:TOTalnum

→(Query)

Description	Queries the total number of waveforms that can be stored for the replay function.	
Syntax	:REPLAY:TOTalnum?	
Related commands	REPLAY:CURRent	
Return parameter	<NR1>	Returns the total number of waveforms.
Example	:REPLAY:TOTalnum? >3000 A maximum of 3000 waveforms can be stored for the replay function.	

:REPLAY:CURRent

(Set)→
→(Query)

Description	Sets or queries the current waveform that is displayed when using the replay function. Note: the scope may need to be in Stop mode to use this function.	
Syntax	REPLAY:CURRent { FORward | BACKward | <NRf> | ? }	
Related commands	REPLAY:TOTalnum?	
Parameter/Return parameter	FORward	Moves to the next waveform in memory

	BACKward	Moves to the previous waveform in memory
	<NRf>	Sets the current waveform number. The waveform number must be equal to or less than the total number of waveforms, as returned by the REPLAY:TOTalnum? query.

Example

REPLAY:TOTalnum?

8.960E+02

REPLAY:CURRent 100

REPLAY:TOTalnum?

1.000E+02

Indicates that there are a total of 896 waveforms. Set the current waveform to #100. The return value (100) indicates that the current waveform is #100.

Rotate Commands

The rotate function sets the screen orientation.

:ROTATE

Set → / → Query

Description	Sets or queries the screen orientation.	
Syntax	:ROTATE { PORTrait | LANDscape | 0 | 1 | ? }	
Parameter/Return parameter	PORTrait / 0	PORTrait
	LANDscape / 1	LANDscape

Example

:ROTATE 0
:ROTATE?

0

Sets the orientation to portrait. Returns the orientation (portrait).

DMM Commands

The DMM commands control the DMM functions on the unit remotely.

:DMM

→ Query

Description	Returns the DMM status.	
Syntax	:DMM?	
Related commands	:MEASUrement:DISPlay	
Parameter/Return parameter	<string>	Returns the mode, current measurement, max measurement, minimum measurement, Hold state.
Example	:DMM? Mode:ACV,Value:0.000,Max Value:0.000,Min Value:0.000,Hold:OFF	

:DMM:VALue

→ Query

Description	Returns the measurement value.
Syntax	:DMM:VALue?

Related commands	:MEASUrement:DISPlay	
Return parameter	<string>	Returns the measurement or value on the display as a string.
Example	:DMM:VALue? 0.000 Returns the value on the DMM display.	

:DMM:HOLD

Set → / → Query

Description	Sets or queries the Hold function status.	
Syntax	:DMM:HOLD { ON | OFF | ?}	
Parameter/Return parameter	ON	Turns the Hold function on.
	OFF	Turns the Hold function off.
Example	:DMM:HOLD ON Turns the Hold function on.	

:DMM:MOD

Set → / → Query

Description	Sets or queries the DMM mode.	
Syntax	:DMM:MOD { DCV | DCMV | ACV | ACMV | DCA | DCMA | ACA | ACMA | OHM | DIODE | BEEP | TEMPerature | ?}	
Parameter/Return parameter	DCV	DCV mode
	DCMV	DCMV mode
	ACV	ACV mode
	ACMV	ACMV mode
	DCA	DCA mode
	DCMA	DCMA mode
	ACA	ACA mode
	ACMA	ACMA mode

	OHM	Resistance measurement mode
	DIODE	Diode tester
	BEEP	Continuity tester
	TEMPerature	Temperature measurement mode
Example	:DMM:MOD DCV Sets the measurement mode to DCV.	

:DMM:TRENDplot

Set →

Description	Resets the DMM trend plot.
Syntax	:DMM:TRENDplot {RESET}
Example	:DMM:TRENDplot RESET

:DMM:ADVanced

Set →
→ Query

Description	Turns the advanced function on or off or returns its status.	
Syntax	:DMM:ADVanced { ON | OFF | ?}	
Parameter/Return parameter	ON	Turn Advanced DMM function on.
	OFF	Turn Advanced DMM function off.
Example	:DMM:ADVanced ON Turns the Advanced DMM function on.	

:DMM:TIMe

Set →
→ Query

Description	Sets or queries the interval time for the trend plot data.
Syntax	:DMM:TIMe {TIME40S|TIME3M|TIME6M|TIME15M|TIME30M|TIME1H|TIME3H|TIME6H}
Parameter/Return	TIME40S

parameter	TIME3M	
	TIME6M	
	TIME15M	
	TIME30M	
	TIME1H	
	TIME3H	
	TIME6H	
Example	:DMM:TIMe 6M Sets the measurement interval time to 6M.	

:DMM:CURSORPOS

Set → / → Query

Description	Sets the cursor position for trend plot in the Advanced DMM function. This command is only applicable when the Hold function is turned on.	
Syntax	:DMM:CURSORPOS { <NR1> | ? }	
Parameter	<NR1>	0 ~ 400
Return parameter	<string>	Returns the cursor position (#data); time at position; measurement value at position
Example	DMM:HOLD ON DMM:CURSORPOS 200 :DMM:CURSORPOS? 200;20.0s;0.0000V Returns cursor position #200 @ 20s with a value of 0V.	

:DMM:TEMPerature:UNITs

Set → / → Query

Description	Sets the units for the temperature measurement function. This command only applies to the GDS-300.	
Syntax	:DMM:TEMPerature:UNITs { Celsius | Fahrenheit | ? }	
Parameter/Return parameter	Celsius	Degrees Celsius
	Fahrenheit	Degrees Fahrenheit
Example	:DMM:TEMPerature:TYPe Celsius Sets the temperature measurement to °C.	

:DMM:TEMPerature:TYPe

Set → / → Query

Description	Sets the type of thermocouple used for the temperature measurement function. This command only applies to the GDS-300.	
Syntax	:DMM:TEMPerature:TYPe { TYPEB | TYPEE | TYPEJ | TYPEK | TYPEN | TYPER | TYPES | TYPET | ? }	
Parameter/Return parameter	TYPEB	B
	TYPEE	E
	TYPEJ	J
	TYPEK	K
	TYPEN	N
	TYPER	R
	TYPES	S
	TYPET	T
Example	:DMM:TEMPerature:TYPe K Sets the temperature measurement function to use the K type thermocouple.	

APPENDX

Error messages

Description	The following error messages may be returned from the :SYSTem:ERRor? query. For details see page 105.
List of error messages	Error number, "Error Description" +0, "No error." -100, "Command error" -101, "Invalid character" -102, "Syntax error" -103, "Invalid separator" -104, "Data type error" -105, "GET not allowed" -108, "Parameter not allowed" -109, "Missing parameter" -110, "Command header error" -111, "Header separator error" -112, "Program mnemonic too long" -113, "Undefined header" -114, "Header suffix out of range" -115, "Unexpected number of parameters" -120, "Numeric data error" -121, "Invalid character in number" -123, "Exponent too large" -124, "Too many digits" -128, "Numeric data not allowed" -130, "Suffix error" -131, "Invalid suffix" -134, "Suffix too long" -138, "Suffix not allowed"

-140, "Character data error"
-141, "Invalid character data"
-144, "Character data too long"
-148, "Character data not allowed"
-150, "String data error"
-151, "Invalid string data"
-158, "String data not allowed"
-160, "Block data error"
-161, "Invalid block data"
-168, "Block data not allowed"
-170, "Expression error"
-171, "Invalid expression"
-178, "Expression data not allowed"
-180, "Macro error"
-181, "Invalid outside macro definition"
-183, "Invalid inside macro definition"
-184, "Macro parameter error"

-200, "Execution error"
-201, "Invalid while in local"
-202, "Settings lost due to rtl"
-203, "Command protected"
-210, "Trigger error"
-211, "Trigger ignored"
-212, "Arm ignored"
-213, "Init ignored"
-214, "Trigger deadlock"
-215, "Arm deadlock"
-220, "Parameter error"
-221, "Settings conflict"
-222, "Data out of range"
-223, "Too much data"
-224, "Illegal parameter value"
-225, "Out of memory"
-226, "Lists not same length"
-230, "Data corrupt or stale"
-231, "Data questionable"
-232, "Invalid format"
-233, "Invalid version"
-240, "Hardware error"

-241, "Hardware missing"
-250, "Mass storage error"
-251, "Missing mass storage"
-252, "Missing media"
-253, "Corrupt media"
-254, "Media full"
-255, "Directory full"
-256, "File name not found"
-257, "File name error"
-258, "Media protected"
-260, "Expression error"
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