

Digital Storage Oscilloscope

GDS-1000A Series

PROGRAMMING MANUAL

GW INSTRON PART NO. 82DS-1102A101



ISO-9001 CERTIFIED MANUFACTURER

GW INSTRON

May 2009 edition

This manual contains proprietary information which is protected by copyright. All rights are reserved. No part of this manual may be photocopied, reproduced or translated to another language without prior written consent of Good Will Corporation.

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.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

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

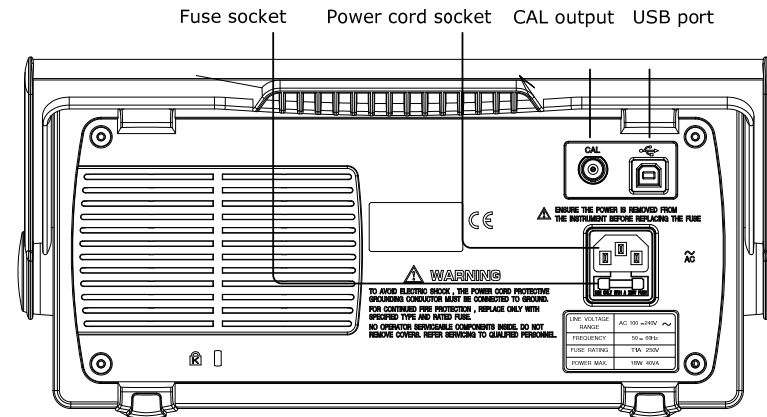
Table of Contents

- INTERFACE OVERVIEW** 4
 - Rear Panel Overview 4
 - Configuring the USB Interface 5
- COMMAND OVERVIEW** 6
 - Command Syntax 6
 - List of Command in Functional Order 7
 - List of Command in Alphabetical Order ... 11
- COMMAND DETAILS** 13
 - System command 14
 - Acquisition Command..... 17
 - Autoset Command 22
 - Channel / Math Command..... 23
 - Cursor Command..... 28
 - Display Command..... 32
 - Measure command 35
 - Save/Recall Command 45
 - Time (Horizontal) command 50
 - Trigger command 53

INTERFACE OVERVIEW

This manual describes how to use the GDS-1000A's remote command functionality and lists the command details. The Overview chapter describes how to configure the GDS-1000A USB remote control interface.

Rear Panel Overview



Configuring the USB Interface

USB connection	PC side connector	Type A, host
	GDS-1000A side connector	Type B, slave
	Speed	1.1/2.0 (full speed)

- Panel operation
1. Connect the USB cable to the USB slave port on the rear.



2. When the PC asks for the USB driver, select dso_cdc_1000.inf which is downloadable from the GW Instek website, www.gwinstek.com, in the GDS-1000A downloads section.
3. On the PC, activate a terminal application such as MTTY (Multi-Threaded TTY). To check the COM port No., see the Device Manager in the PC. For WindowsXP, select Control panel → System → Hardware tab.
4. Run this query command via the terminal application.
*idn?
This command should return the manufacturer, model number, serial number, and firmware version in the following format.
GW, GDS-1002A, 000000001, V1.00
5. Configuring the command interface is completed. Refer to the other chapters for more details.
 - Page6: list of commands and command syntax
 - Page13: details of each command

COMMAND OVERVIEW

The Command overview chapter lists all GDS-1000A commands in functional order as well as alphabetical order. The command syntax section shows you the basic syntax rules you have to apply when using commands.

Command Syntax

- Compatible standard
- USB CDC_ACM compatible
 - SCPI, 1994 (partially compatible)

Command format `trig:del:mod <NR1>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>	decimal numbers	0.1, 3.14, 8.5
	<NR3>	floating point	4.5e-1, 8.25e+1
	<NRf>	any of NR1, 2, 3	1, 1.5, 4.5e-1

Message terminator	LF^END	Description
	LF	line feed code (hexadecimal 0A) with END message
	<dab>^END	line feed code
	<dab>^END	last data byte with END message

Note Commands are non-case sensitive.

List of Command in Functional Order

System	*IDN	14
	*LRN	14
	*RST	15
	:SYSTem:ERRor.....	15
	:SYSTem:VERSion	16
<hr/>		
Acquisition	:ACQuire:AVERage	17
	:ACQuire:HDELay.....	18
	:ACQuire:MODE	18
	:ACQuire<X>:LMEMory	19
	:ACQuire<X>:MEMory	20
<hr/>		
Autoset	:AUToset.....	22
<hr/>		
Channel / Math	:CHANnel<X>:BWLimit	23
	:CHANnel<X>:COUPling	23
	:CHANnel<X>:DISPlay	24
	:CHANnel<X>:EXPand	24
	:CHANnel<X>:INVert	25
	:CHANnel<X>:MATH	25
	:CHANnel<X>:OFFSet	26
	:CHANnel<X>:PROBe	26
	:CHANnel<X>:SCALE	27
<hr/>		
Cursor	:CURSor:X<X>Position.....	28
	:CURSor:Y<X>Position.....	29
	:CURSor:<X>DELta.....	29
	:CURSor:<X>DISplay.....	30
	:CURSor:SOURce.....	31

Display	:DISPlay:ACCumulate.....	32
	:DISPlay:CONTRast.....	32
	:DISPlay:GRATICule	33
	:DISPlay:WAVEform.....	33
	:REFresh	34
<hr/>		
Measure	:MEASure:FALL.....	35
	:MEASure:FOVShoot.....	36
	:MEASure:FPReshoot	36
	:MEASure:FREQuency.....	37
	:MEASure:NWIDth	37
	:MEASure:PDUTy.....	37
	:MEASure:PERiod	38
	:MEASure:PWIDth	38
	:MEASure:RISe.....	39
	:MEASure:ROVShoot.....	39
	:MEASure:RPReshoot.....	40
	:MEASure:SOURce	40
	:MEASure:VAMPliitude	40
	:MEASure:VAverage	41
	:MEASure:VHI.....	41
	:MEASure:VLO	42
	:MEASure:VMAX.....	42
	:MEASure:VMIN	43
	:MEASure:VPP	43
	:MEASure:VRMS	44

Save/Recall	:MEMory<X>:RECall:SETup	45
	:MEMory<X>:RECall:WAVeform.....	45
	:MEMory<X>:SAVe:SETup	46
	:MEMory<X>:SAVe:WAVeform.....	46
	*RCL	47
	:REF<X>:DISPlay.....	47
	:REF<X>:LOCate	48
	:REF<X>:SAVe	48
	*SAV	49
<hr/>		
Time	:TIMebase:DELay	50
(Horizontal)	:TIMebase:SCALe	50
	:TIMebase:SWEp	51
	:TIMebase:WINDow:DELay	51
	:TIMebase:WINDow:SCALe.....	52

(Continued on next page)

Trigger	:FORCe	53
	:RUN	54
	:SINGLe	54
	:STOP	54
	*TRG	54
	:TRIGger:COUPLe.....	54
	:TRIGger:FREQuency.....	55
	:TRIGger:LEVel.....	55
	:TRIGger:MODE.....	55
	:TRIGger:NREJ	56
	:TRIGger:PULSe:MODE.....	57
	:TRIGger:PULSe:TIme	57
	:TRIGger:REJect	58
	:TRIGger:SLOP.....	58
	:TRIGger:STATe	59
	:TRIGger:SOURce	59
	:TRIGger:TYPe.....	60
	:TRIGger:VIDeo:FIELD	60
	:TRIGger:VIDeo:LINE	61
	:TRIGger:VIDeo:POLarity	61
	:TRIGger:VIDeo:TYPe	62

List of Command in Alphabetical Order

Command	Page	Command	Page
A			
:ACQuire:AVERAge	17	*LRN	14
:ACQuire:HDElay	18	M	
:ACQuire:MODE	18	:MEASure:FALL	35
:ACQuire<X>:LMEMory	19	:MEASure:FOVShoot	36
:ACQuire<X>:MEMory	20	:MEASure:FPReshoot	36
:AUToset	22	:MEASure:FREQuency	37
C			
:CHANnel<X>:BWLimit	23	:MEASure:NWIDth	37
:CHANnel<X>:COUPLing	23	:MEASure:PDUTy	37
:CHANnel<X>:DISPlay	24	:MEASure:PERiod	38
:CHANnel<X>:EXPand	24	:MEASure:PWIDth	38
:CHANnel<X>:INVert	25	:MEASure:RISe	39
:CHANnel<X>:MATH	25	:MEASure:ROVShoot	39
:CHANnel<X>:OFFSet	26	:MEASure:RPReshoot	40
:CHANnel<X>:PROBE	26	:MEASure:SOURce	40
:CHANnel<X>:SCALE	27	:MEASure:VAMPlitude	40
:CURSor:SOURce	31	:MEASure:VAverage	41
:CURSor:X1Position	28	:MEASure:VHI	41
:CURSor:X2Position	28	:MEASure:VLO	42
:CURSor:XDELta	29	:MEASure:VMAX	42
:CURSor:XDISplay	30	:MEASure:VMIN	43
:CURSor:Y1Position	29	:MEASure:VPP	43
:CURSor:Y2Position	29	:MEASure:VRMS	44
:CURSor:YDELta	29	:MEMory<X>:RECall:SETup	45
:CURSor:YDISplay	30	:MEMory<X>:RECall:WAVEform	45
D			
:DISPlay:ACCumulate	32	:MEMory<X>:SAVe:SETup	46
:DISPlay:CONTrast	32	:MEMory<X>:SAVe:WAVEform	46
:DISPlay:GRATicule	33	R	
:DISPlay:WAVEform	33	*RCL	47
F			
:FORCe	53	:REF<X>:DISPlay	47
I			
*IDN	14	:REF<X>:LOCate	48
		:REF<X>:SAVe	48
		:REFresh	34
		*RST	15
		:RUN	54

Command	Page	Command	Page
S			
*SAV	49	:TRIGger:LEVel	55
:SINGle	54	:TRIGger:MODE	55
:STOP	54	:TRIGger:NREJ	56
:SYSTem:ERRor	15	:TRIGger:PULSe:MODE	57
:SYSTem:VERsion	16	:TRIGger:PULSe:TIME	57
T			
:TIMebase:DElay	50	:TRIGger:REJect	58
:TIMebase:SCALE	50	:TRIGger:REject	58
:TIMebase:SWEEp	51	:TRIGger:SLOP	58
:TIMebase:WINDow:DElay	51	:TRIGger:SOURce	59
:TIMebase:WINDow:SCALE	52	:TRIGger:STATE	59
*TRG	54	:TRIGger:TYPE	60
:TRIGger:COUPLe	54	:TRIGger:VIDeo:FIELD	60
:TRIGger:FREQuency	55	:TRIGger:VIDeo:LINE	61
		:TRIGger:VIDeo:POLarity	61
		:TRIGger:VIDeo:TYPe	62

C COMMAND DETAILS

The Command details chapter shows the detailed syntax, equivalent panel operation, and example for each command. For the list of all commands, see page 7.

System command	14
Acquisition Command.....	17
Autoset Command	22
Channel / Math Command.....	23
Cursor Command.....	28
Display Command.....	32
Measure command	35
Save/Recall Command	45
Time (Horizontal) command	50
Trigger command.....	53

System command

*IDN	14
*LRN.....	14
*RST	15
:SYSTem:ERRor.....	15
:SYSTem:VERSion.....	16

*IDN → Query

Description	Returns the oscilloscope ID: manufacturer, model name, serial number, and firmware version. Same as: Utility key → F4
Syntax	:idn?
Example	:idn? Returns the ID for a GW, GDS-1102A, P930116, GDS-1102A. V1.00

*LRN → Query

Description	Returns the oscilloscope settings as a data string.
Syntax	:lrm?

Example :lrn?
 :DISPlay:WAVeform 0;ACCumulate 0;CONTRast 0;GRATicule 0;;CHANnel1:DISPlay 1;BWLimit 0;COUPling 0;INVert 0;OFFSet 2.000e+00;PROBe 3;SCALe 2.000e+00;;CHANnel2:DISPlay 1;BWLimit 0;COUPling 0;INVert 0;OFFSet 2.000e+00;PROBe 3;SCALe 2.000e+00;;CHANnel1:MATH 0;TIMEbase:SWEEp 0;SCALe 2.500e-06;DELAy 0.000e+00;WINDow:SCALe 2.50000e-07;DELAy 0.00000e+00;;ACQuire:MODE 0;AVERAge 0;TRIGger:TYPe 0;SOURce 0;MODE 1;SLOP 0;COUPlE 1;REJect 0;NREJ 0;LEVEl 0.00000e+00;PULSe:MODE: 0;TIME 0.00000e+00;;VIDeo:TYPe 1;POLarity 0;FIElD 0;LINE 0;;CURSor:SOURce 1;XDISPlay 0;X1Position 75;X2Position 175;YDISPlay 0;Y1Position 54;Y2Position 154;REF1:DISPlay 0;LOCate 50;;REF2:DISPlay 0;LOCate -50;;RUN

***RST**

Set →

Description Resets the GDS-1000A (recalls the default panel settings).
 Same as: Save/Recall key → F1

Syntax *rst

:SYSTem:ERRor

→ Query

Description Returns the oscilloscope system error message, if there is any.

Syntax < Long > < Short >
 :system:error? :sys:err?

Parameter	ID	Contents	ID	Contents
	-100	command error	-102	syntax error
	-220	parameter error	-221	settings conflict
	-222	data out of range	-223	too much data
	-224	illegal parameter	-232	invalid format

Example :system:error?
 -102 Indicates that the command syntax is wrong

:SYSTem:VERSion

→ Query

Description Returns the oscilloscope firmware version.
 Same as: Utility key → F4 (only the firmware version)

Syntax < Long > < Short >
 :system:version? :sys:vers?

Note For retrieving all system information including the firmware version, use the *idn? command.

Acquisition Command

:ACquire:AVERage	17
:ACquire:HDElay.....	18
:ACquire:MODE	18
:ACquire<X>:LMEMory	19
:ACquire<X>:MEMory	20

Set →
 → Query

:ACquire:AVERage				
Description	Selects or returns the average number of waveform acquisition in the average acquisition mode. Same as: Acquire key → F2			
Syntax	< Long >			< Short >
	:acquire:average <NR1>			:acq:aver <NR1>
	:acquire:average?			:acq:aver?
Parameter	<NR1>	Average No.	<NR1>	Average No.
	1	2	5	32
	2	4	6	64
	3	8	7	128
	4	16	8	256
Note	Before using this command, select the average acquisition mode. See the example below.			
Example	:acquire:mode 2	Selects the average acquisition mode, and select the average number 4		
	:acquire:average 2			

Set →
 → Query

:ACquire:HDElay				
Description	Set or query Delay On or Delay Off. Same as: Acquire key → F4			
Syntax	< Long >			< Short >
	:acquire:hdelay <Boolean>			:acq:hdel <Boolean>
	:acquire:hdelay?			:acq:hdel?
Parameter	<NR1>	Delay		
	0	Off		
	1	On		
Example	:acquire:hdelay 1	Turns Delay On. Returns the Delay as On.		
	:acquire:hdelay?			
	1			

Set →
 → Query

:ACquire:MODE				
Description	Selects or returns the acquisition mode. Same as: Acquire key → F1 ~ F3			
Syntax	< Long >			< Short >
	:acquire:mode <NR1>			:acq:mod <NR1>
	:acquire:mode?			:acq:mod?
Parameter	<NR1>	Mode	<NR1>	Mode
	0	Normal	2	Average
	1	Peak detect		
Example	:acquire:mode 2	Selects the average acquisition mode, and select the average number 4		
	:acquire:average 2			

:ACquire<X>:LMEMory → **Query**

Description	Returns the total waveform data in the acquisition memory for long memory.	
Syntax	< Long >	< Short >
	:acquire<X>:lmemory?	:acq<X>:lmem?
Parameter	<X>	Channel
	1/2	Channel1/2
Note	<p>Please note that the number of points is limited to 4000 when the scope is running.</p> <p>You can get the full memory depth when the “Single” key is pressed with a triggered signal.</p> <p>You can also get the full memory depth when the “STOP” key is pressed,</p> <p>However, the long memory may not fully fill up if a slow time base is used with a fast sample rate</p> <p>Also note that there are several time base settings that don’t result in 100% of available memory, due to a limited number of available sample rates.</p>	
Example	:acquire1:lmemory?	<p>Returns the channel 1 long memory waveform data</p> <p>If both channels are active up to 1M points are returned. If only CH1 is active then up to 2M points are returned.</p>
Data format	Six data elements are concatenated to form one data string.	

#	A	B	C	D	E	F
A:	Data size digit			B: Data size		
C:	Time interval			D: Channel indicator		
E:	Reserved data			F: Waveform data		

Data size digit

Indicates the number of digits used for the data string that follows. The data size digit is 4 for 4000 points, 7 for 1M or 2M points.

Data size

Indicates the data size. The data size varies from 8008 (4000 points), 2000008 (1M points) or 4000008 (2M points).

Time interval

Indicates the time interval between two adjacent sampling points in the floating point format, compatible with IEEE 754 standards.

Note: The data is sorted in the little-endian format.

Channel indicator

Indicates the channel, 1 or 2.

Reserved data

An unused data block, 3 bytes.

Waveform data

The waveform data comprised of 2M data points. Each point is made up of 2 bytes (16 bits), high byte (MSB) first.

:ACquire<X>:MEMory → **Query**

Description	Returns the total waveform data in the acquisition memory.	
Syntax	< Long >	< Short >
	:acquire<X>:memory?	:acq<X>:mem?

Parameter	<X> 1/2	Channel Channel1/2
Example	:acquire1:memory?	Returns the channel 1 waveform data
Data format	<p>Six data elements are concatenated to form one data string.</p> <p># A B C D E F</p> <p>A: Data size digit B: Data size</p> <p>C: Time interval D: Channel indicator</p> <p>E: Reserved data F: Waveform data</p> <p>Data size digit Indicates the number of digits used for the data string that follows. The data size digit is always 4.</p> <p>Data size Indicates the data size. The data size is always 8008 (4000 points per channel).</p> <p>Time interval Indicates the time interval between two adjacent sampling points in the floating point format, compatible with IEEE 754 standards. Note: The data is sorted in the little-endian format.</p> <p>Channel indicator Indicates the channel, 1 or 2.</p> <p>Reserved data An unused data block, 3 bytes.</p> <p>Waveform data The waveform data comprised of 8000 data points. Each point is made up of 2 bytes (16 bits), high byte (MSB) first.</p>	

Autoset Command

:AUToset Set →

Description	<p>Runs the Autoset function to automatically configure the horizontal scale, vertical scale, and trigger according to the input signal.</p> <p>Same as: Auto Set key</p>	
Syntax	< Long > :autoset	< Short > :aut

Channel / Math Command

:CHANnel<X>:BWLimit	23
:CHANnel<X>:COUPling	23
:CHANnel<X>:DISPlay	24
:CHANnel<X>:EXPand	24
:CHANnel<X>:INVert	25
:CHANnel<X>:MATH	25
:CHANnel<X>:OFFSet	26
:CHANnel<X>:PROBe	26
:CHANnel<X>:SCALE	27

(Set) →
→ (Query)

:CHANnel<X>:BWLimit													
Description	Selects or returns the bandwidth limit on/off. Same as: Channel key → F3												
Syntax	<table border="0"> <tr> <td>< Long ></td> <td>< Short ></td> </tr> <tr> <td>:channel<X>:bwlimit <Boolean></td> <td>:chan<X>:bwlimit</td> </tr> <tr> <td>:channel<X>:bwlimit?</td> <td><Boolean></td> </tr> <tr> <td></td> <td>:chan:bwlimit?</td> </tr> </table>	< Long >	< Short >	:channel<X>:bwlimit <Boolean>	:chan<X>:bwlimit	:channel<X>:bwlimit?	<Boolean>		:chan:bwlimit?				
< Long >	< Short >												
:channel<X>:bwlimit <Boolean>	:chan<X>:bwlimit												
:channel<X>:bwlimit?	<Boolean>												
	:chan:bwlimit?												
Parameter	<table border="0"> <tr> <td><X></td> <td>Channel</td> <td><NR1></td> <td>Limit</td> </tr> <tr> <td>1/2</td> <td>CH1/2</td> <td>0</td> <td>Off</td> </tr> <tr> <td></td> <td></td> <td>1</td> <td>On</td> </tr> </table>	<X>	Channel	<NR1>	Limit	1/2	CH1/2	0	Off			1	On
<X>	Channel	<NR1>	Limit										
1/2	CH1/2	0	Off										
		1	On										
Example	:channel1:bwlimit 1 Turns on the bandwidth limit for Channel 1												

(Set) →
→ (Query)

:CHANnel<X>:COUPling			
Description	Selects or returns the coupling mode. Same as: Channel key → F1		
Syntax	<table border="0"> <tr> <td>< Long ></td> <td>< Short ></td> </tr> </table>	< Long >	< Short >
< Long >	< Short >		

	:channel<X>:coupling <NR1>	:chan<X>:coup <NR1>																
	:channel<X>:coupling?	:chan:coup?																
Parameter	<table border="0"> <tr> <td><X></td> <td>Channel</td> <td><NR1></td> <td>Coupling mode</td> </tr> <tr> <td>1/2</td> <td>CH1/2</td> <td>0</td> <td>AC coupling</td> </tr> <tr> <td></td> <td></td> <td>1</td> <td>DC coupling</td> </tr> <tr> <td></td> <td></td> <td>2</td> <td>Ground coupling</td> </tr> </table>	<X>	Channel	<NR1>	Coupling mode	1/2	CH1/2	0	AC coupling			1	DC coupling			2	Ground coupling	
<X>	Channel	<NR1>	Coupling mode															
1/2	CH1/2	0	AC coupling															
		1	DC coupling															
		2	Ground coupling															
Example	:channel1:coupling 1	Selects the DC coupling for Channel 1																

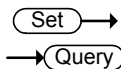
(Set) →
→ (Query)

:CHANnel<X>:DISPlay													
Description	Turns a channel on/off or returns its status. Same as: Channel key												
Syntax	<table border="0"> <tr> <td>< Long ></td> <td>< Short ></td> </tr> <tr> <td>:channel<X>:display <Boolean></td> <td>:chan<X>:disp <Boolean></td> </tr> <tr> <td>:channel<X>:display?</td> <td><Boolean></td> </tr> <tr> <td></td> <td>:chan<X>:disp?</td> </tr> </table>	< Long >	< Short >	:channel<X>:display <Boolean>	:chan<X>:disp <Boolean>	:channel<X>:display?	<Boolean>		:chan<X>:disp?				
< Long >	< Short >												
:channel<X>:display <Boolean>	:chan<X>:disp <Boolean>												
:channel<X>:display?	<Boolean>												
	:chan<X>:disp?												
Parameter	<table border="0"> <tr> <td><X></td> <td>Channel</td> <td><NR1></td> <td>Channel on/off</td> </tr> <tr> <td>1/2</td> <td>CH1/2</td> <td>0</td> <td>Off</td> </tr> <tr> <td></td> <td></td> <td>1</td> <td>On</td> </tr> </table>	<X>	Channel	<NR1>	Channel on/off	1/2	CH1/2	0	Off			1	On
<X>	Channel	<NR1>	Channel on/off										
1/2	CH1/2	0	Off										
		1	On										
Example	:channel1:display 1 Turns on Channel 1												

(Set) →
→ (Query)

:CHANnel<X>:EXPand									
Description	Sets Expand from ground or from center for a channel. Queries the Expand status of a channel. Same as: Channel key → Expand								
Syntax	<table border="0"> <tr> <td>< Long ></td> <td>< Short ></td> </tr> <tr> <td>:channel<X>:expand <Boolean></td> <td>:chan<X>:exp <Boolean></td> </tr> <tr> <td>:channel<X>:expand?</td> <td><Boolean></td> </tr> <tr> <td></td> <td>:chan<X>:exp?</td> </tr> </table>	< Long >	< Short >	:channel<X>:expand <Boolean>	:chan<X>:exp <Boolean>	:channel<X>:expand?	<Boolean>		:chan<X>:exp?
< Long >	< Short >								
:channel<X>:expand <Boolean>	:chan<X>:exp <Boolean>								
:channel<X>:expand?	<Boolean>								
	:chan<X>:exp?								

Parameter	<X> 1/2	Channel CH1/2	<NR1> 0 1	Expand Ground Center
Example	:channel1:expand 1		Sets Channel 1 to Expand from Center.	
	:channel1:expand? 1		Returns expand from center (1) as channel 1's Expand status.	

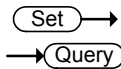


:CHANnel<X>:INVert

Description	Inverts a channel or returns its status. Same as: Channel key → F2		
Syntax	< Long >	< Short >	
	:channel<X>:invert <Boolean>	:chan<X>:inv <Boolean>	
	:channel<X>:invert?	:chan<X>:inv?	

Parameter	<X> 1/2	Channel CH1/2	<NR1> 0 1	Channel invert off on
-----------	------------	------------------	-----------------	-----------------------------

Example :channel1:invert 1 Inverts Channel 1



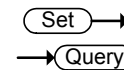
:CHANnel<X>:MATH

Description	Selects or returns the math operation type. Same as: Math key → F1		
Syntax	< Long >	< Short >	
	:channel<X>:math <NR1>	:chan<X>:math <NR1>	
	:channel<X>:math?	:chan<X>:math?	

Parameter	<X> 1/2	Channel CH1 or CH2	<NR1> 0	Math operation Math off
-----------	------------	-----------------------	------------	----------------------------

		1	Add
		2	Subtract
		3	Multiply
		4	FFT
		5	FFTrms

Example1 :channel1:math 2 Channel 1 - Channel 2
 Example2 :channel2:math 2 Channel 2 - Channel 1
 Example3 :channel2:math 4 Runs FFT on Channel 2

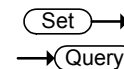


:CHANnel<X>:OFFSet

Description	Sets or returns the offset level for a channel. The offset level range depends on the vertical scale.		
Syntax	< Long >	< Short >	
	:channel<X>:offset <NR3>	:chan<X>:offs <NR3>	
	:channel<X>:offset?	:chan<X>:offs?	

Parameter	<X> 1/2	Channel CH1/2	<NR3> ±0.5~ ±5 ±5.0~ ±50 ±50.0~ ±300	Offset level ±0.5V ~ ±5V (2mV/div~50mV/div) ±5.0V ~ ±50V (100mV/div~500mV/div) ±50.0V ~ ±300V (1V/div ~ 10V/div)
-----------	------------	------------------	--	--

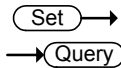
Example :channel1:scale 1.00e-2 Sets the Channel 1 scale to 10mV/div
 :channel1:offset 2.00e-2 Sets the Channel 1 offset to 20mV



:CHANnel<X>:PROBe

Description	Sets or returns the probe attenuation factor. Same as: Channel key → F4			
Syntax	< Long >		< Short >	
	:channel<X>:probe <NR3>		:chan<X>:prob <NR1>	
	:channel<X>:probe?		:chan<X>:prob?	
Parameter	<X>	Channel	<NR1>	Probe attenuation factor
	1/2	CH1/2	0	1x
			1	10x
			2	100x
Example	:channel1:probe 1		Sets the Channel 1 probe attenuation factor to 10x	

:CHANnel<X>:SCALE

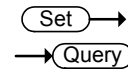


Description	Sets or returns the vertical scale. The scale depends on the probe attenuation factor. Same as: Volts/Div knob			
Syntax	< Long >		< Short >	
	:channel<X>:scale <NR3>		:chan<X>:scal <NR3>	
	:channel<X>:scale?		:chan<X>:scal?	
Parameter	<X>	Channel	<NR3>	Vertical scale
	1/2	CH1/2	2e-3 ~ 5e+0	2mV ~ 10V (Probe x1)
			2e-2 ~ 1e+2	20mV ~ 100V (Probe x10)
			2e-1 ~ 1e+3	200mV ~ 1000V (Probe x100)
Example	:channel1:probe 0		Sets the Channel 1 probe attenuation factor to x1	
	:channel1:scale 2.00e-3		Sets the Channel 1 vertical scale to 2mV/div	

Cursor Command

:CURSor:X<X>Position.....	28
:CURSor:Y<X>Position.....	29
:CURSor:<X>DELta.....	29
:CURSor:<X>DISplay.....	30
:CURSor:SOURce.....	31

:CURSor:X<X>Position



Description	Sets or returns the horizontal (X axis) cursor position. Same as: Cursor key → F5 (X-Y) → F2 (X1) or F3 (X2) + Variable knob		
Syntax	< Long >		< Short >
	:cursor:x<X>position <NR1>		:curs:x<X>p <NR1>
	:cursor:x<X>position?		:curs:x<X>p?
Parameter	<X>	Cursor 1 or 2	<NR1> Cursor position
	1	Cursor X1	1 ~ 249
	2	Cursor X2	1 ~ 249 point
Note	When in the query mode, the returned data format is <NR3> as follows. CH1, CH2, Math (CH1 ± CH2): time (s) Math (FFT): frequency (Hz)		
Example	:cursor:xdisplay 1		Puts the horizontal cursor X1 on the 100 point position
	:cursor:x1position 100		
	:channel:math 3		Returns the X1 cursor position as 2500Hz in the Math FFT mode
	:cursor:xdisplay 1		
	:cursor:x1position?		
	→ 2.500E+03		

Set →
 → Query

:CURSor:Y<X>Position

Description	Selects or returns the vertical (Y axis) cursor position. Same as: Cursor key →F5 (X-Y) → F2(Y1) or F3(Y2) + Vertical knob		
Syntax	< Long >	< Short >	
	:cursor:y<X>position <NR1>	:curs:y<X>p <NR1>	
	:cursor:y<X>position?	:curs:y<X>p?	
Parameter	<X>	Cursor 1 or 2	<NR1> Cursor position
	1	Cursor Y1	1 ~ 199 1 ~ 199 point
	2	Cursor Y2	
Note	When in the query mode, the returned data format is <NR3> as follows. CH1, CH2, Math (CH1 ± CH2): voltage (V) Math (FFT): decibel (dB)		
Example	:cursor:ydisplay 1 :cursor:y1position 100	Puts the vertical cursor Y1 on the 100 point position	
	:channel:math 3 :cursor:ydisplay 1 :cursor:y1position? → 2.500E+00	Returns the Y1 cursor position as 2.5dB in the Math FFT mode	

:CURSor:<X>DELta → Query

Description	Returns the distance between two horizontal (X axis) or vertical (Y axis) cursors. Same as: Cursor key →F5 (X-Y) → F4		
Syntax	< Long >	< Short >	

	:cursor:<X>delta?	:curs:<X>del?
Parameter	<X>	Horizontal or vertical cursor
	x	Horizontal cursor (X axis)
	y	Vertical cursor (Y axis)
Note	The returned data format is <NR3> as follows. CH1, CH2, Math (CH1 ± CH2): time (s) for horizontal cursor, voltage (V) for vertical cursor Math (FFT): frequency (Hz) for horizontal cursor, decibel (dB) for vertical cursor	
Example	:channel:math 3 :cursor:xdisplay 1 :cursor:xdelta? → 2.500E+03	Returns the frequency (2500Hz) between the two horizontal cursors in the Math FFT mode
	:channel:math 3 :cursor:ydisplay 1 :cursor:ydelta? → 2.500E+00	Returns the decibel (2.5dB) between the two vertical cursors in the Math FFT mode

Set →

:CURSor:<X>DISplay

Description	Turns the horizontal or vertical cursors on/off. Same as: Cursor key		
Syntax	< Long >	< Short >	
	:cursor:y<X>display <Boolean>	:curs:y<X>dis <Boolean>	
Parameter	<X>	X or Y cursor	<NR1> Cursor on/off
	x	X (horizontal)	0 off
	y	Y (vertical)	1 on
Example	:cursor:ydisplay 1	Turn Y cursor on	

		(Set) →
		→ (Query)
:CURSor:SOURce		
Description	Selects or returns the cursor source channel. Same as: Cursor key →F1 (Source)	
Syntax	< Long >	< Short >
	:cursor:source <NR1>	:curs:sour <NR1>
	:cursor:source?	:curs:sour?
Parameter	<NR1>	Cursor source channel
	1/2	Channel ½
	3	Math result
Example	:cursor:source 2	Selects Channel 2 as the cursor source

Display Command

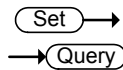
:DISPlay:ACCumulate.....	32
:DISPlay:CONTRast.....	32
:DISPlay:GRATICule.....	33
:DISPlay:WAVEform.....	33
:REFresh.....	34

		(Set) →
		→ (Query)
:DISPlay:ACCumulate		
Description	Turns the display accumulate mode on/off or returns its status. Same as: Display key → F2	
Syntax	< Long >	< Short >
	:display:accumulate <Boolean>	:disp:acc <Boolean>
	:display:accumulate?	:disp:acc?
Parameter	<NR1>	Display accumulation
	0	off
	1	on
Example	:display:accumulate 1	Turns on the accumulation

		(Set) →
		→ (Query)
:DISPlay:CONTRast		
Description	Sets or returns the display contrast level. Same as: Display key → F4	
Syntax	< Long >	< Short >
	:display:contrast <NR1>	:disp:cont <NR1>
	:display:contrast?	:disp:cont?

Parameter	<NR1> Display contrast
	-10 ~ 10 Lowest (-10) to the Highest (+10)

Example :display:contrast 0 Sets the display contrast to the middle (±0)



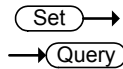
:DISPlay:GRATICule

Description Sets or returns the display grid type.
Same as: Display key → F5

Syntax	< Long >	< Short >
	:display:graticule <NR1>	:disp:grat <NR1>
	:display:graticule?	:disp:grat?

Parameter	<NR1> Grid type	<NR1> Grid type
	0 Full mode	2 Frame mode
	1 Cross mode	

Example :display:graticule 0 Selects the full grid



:DISPlay:WAVEform

Description Sets or returns the display waveform type.
Same as: Display key → F1

Syntax	< Long >	< Short >
	:display:waveform <NR1>	:disp:wav <NR1>
	:display:waveform?	:disp:wav?

Parameter	<NR1> Display waveform type
	0 Vectors
	1 Dots

Example :display:waveform 0 Selects the vectors waveform

:REFresh (Set) →

Description Erases the existing waveform and draws a new one.
Same as: Display key → F3

Syntax	< Long >	< Short >
	:refresh	:refr

Measure command

:MEASure:FALL.....	35
:MEASure:FOVShoot.....	36
:MEASure:FPreShoot.....	36
:MEASure:FREQuency.....	37
:MEASure:NWIDth.....	37
:MEASure:PDUTy.....	37
:MEASure:PERiod.....	38
:MEASure:PWIDth.....	38
:MEASure:RISe.....	39
:MEASure:ROVShoot.....	39
:MEASure:RPreShoot.....	40
:MEASure:SOURce.....	40
:MEASure:VAMPLitude.....	40
:MEASure:VAverage.....	41
:MEASure:VHI.....	41
:MEASure:VLO.....	42
:MEASure:VMAX.....	42
:MEASure:VMIN.....	43
:MEASure:VPP.....	43
:MEASure:VRMS.....	44

:MEASure:FALL → Query

Description	Returns the falltime measurement result. Same as: Measure key → F1~F5 → F3 (Fall Time)
Syntax	< Long > < Short > :measure:fall? :meas:fall?
Returns	<NR3>
Note	Before using this command, select the measurement channel. See the example below.

Example	:measure:source 1 :measure:fall?	Selects Channel 1, and then measures the fall time.
---------	-------------------------------------	---

:MEASure:FOVShoot → Query

Description	Returns the fall overshoot amplitude. Same as: Measure key → F1~F5 → F3 (FOVShoot)	
Syntax	< Long > < Short > :measure:fovshoot? :meas:fovs?	
Returns	<NR2> with % sign	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:fall?	Selects Channel 1, and then measures the fall overshoot.

:MEASure:FPreShoot → Query

Description	Returns fall preshoot amplitude. Same as: Measure key → F1~F5 → F3 (FPREShoot)	
Syntax	< Long > < Short > :measure:fovshoot? :meas:fovs?	
Returns	<NR2> with % sign	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:fall?	Selects Channel 1, and then measures the fall preshoot.

:MEASure:FREQuency → **Query**

Description	Returns the frequency value. Same as: Measure key → F1~F5 → F3 (Frequency)	
Syntax	< Long > :measure:frequency?	< Short > :meas:freq?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:frequency?	Selects Channel 1, and then measures the frequency.

:MEASure:NWIDth → **Query**

Description	Returns the first negative pulse width timing. Same as: Measure key → F1~F5 → F3 (-Width)	
Syntax	< Long > :measure:nwidth?	< Short > :meas:nwid?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:nwidth?	Selects Channel 1, and then measures the negative pulse width.

:MEASure:PDUTy → **Query**

Description	Returns the positive duty cycle ratio. Same as: Measure key → F1~F5 → F3 (DutyCycle)	
Syntax	< Long >	< Short >

	:measure:pduty?	:meas:pdut?
Returns	<NR2> as the percentage	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:pduty?	Selects Channel 1, and then measures the positive duty cycle.

:MEASure:PERiod → **Query**

Description	Returns the period. Same as: Measure key → F1~F5 → F3 (Period)	
Syntax	< Long > :measure:period?	< Short > :meas:per?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:period?	Selects Channel 1, and then measures the period.

:MEASure:PWIDth → **Query**

Description	Returns the first positive pulse width. Same as: Measure key → F1~F5 → F3 (+Width)	
Syntax	< Long > :measure:period?	< Short > :meas:per?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	

Example :measure:source 1 Selects Channel 1, and
:measure:pwidth? then measures the
positive pulse width.

:MEASure:RISe → Query

Description Returns the first pulse rising edge timing.
Same as: Measure key → F1~F5 → F3 (RiseTime)

Syntax < Long > < Short >
:measure:rise? :meas:ris?

Returns <NR3>

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

Example :measure:source 1 Selects Channel 1, and
:measure:rise? then measures the
rising edge timing.

:MEASure:ROVShoot → Query

Description Returns rise overshoot amplitude in percentage.
Same as: Measure key → F1~F5 → F3 (ROVShoot)

Syntax < Long > < Short >
:measure:rovshoot? :meas:rovs?

Returns <NR2> with % sign

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

Example :measure:source 1 Selects Channel 1, and
:measure:rovshoot? then measures the rise
overshoot.

:MEASure:RPReshoot → Query

Description Returns rise overshoot amplitude in percentage.
Same as: Measure key → F1~F5 → F3 (RPReshoot)

Syntax < Long > < Short >
:measure:rprehoot? :meas:rpr?

Returns <NR2> with % sign

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

Example :measure:source 1 Selects Channel 1, and
:measure:rprehoot? then measures the rise
prehoot.

Set →

:MEASure:SOURce → Query

Description Selects the measurement channel.
Same as: Measure key → F1~F5 → F1, F2

Syntax < Long > < Short >
:measure:source <NR1> :meas:sour <NR1>
:measure:source? :meas:sour?

Parameter <NR1>
1 ~ 2 Channel1 ~ 2

Example :measure:source 1 Selects Channel 1, and
:measure:rprshoot? then measures the rise
prehoot.

:MEASure:VAMplitude → Query

Description Returns the voltage difference between positive
and negative peak.
Same as: Measure key → F1~F5 → F3 (Vamp)

Syntax	< Long > :measure:vamplitude?	< Short > :meas:vamp?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:vamplitude?	Selects Channel 1, and then measures the rise Voltage amplitude.

:MEASure:VAverage → Query

Description	Returns the average voltage. Same as: Measure key → F1~F5 → F3 (Vavg)	
Syntax	< Long > :measure:vaverage?	< Short > :meas:vavg?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:vaverage?	Selects Channel 1, and then measures the average Voltage.

:MEASure:VHI → Query

Description	Returns the global high voltage. Same as: Measure key → F1~F5 → F3 (Vhi)	
Syntax	< Long > :measure:vhi?	< Short > :meas:vhi?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	

Example	:measure:source 1 :measure:vhi?	Selects Channel 1, and then measures the global high Voltage.
---------	------------------------------------	---

:MEASure:VLO → Query

Description	Returns the global low voltage. Same as: Measure key → F1~F5 → F3 (Vlo)	
Syntax	< Long > :measure:vlo?	< Short > :meas:vlo?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:vlo?	Selects Channel 1, and then measures the global low Voltage.

:MEASure:VMAX → Query

Description	Returns the maximum amplitude. Same as: Measure key → F1~F5 → F3 (Vmax)	
Syntax	< Long > :measure:vmax?	< Short > :meas:vmax?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:vmax?	Selects Channel 1, and then measures the maximum amplitude.

:MEASure:VMIN → **Query**

Description	Returns the minimum amplitude. Same as: Measure key → F1~F5 → F3 (Vmin)	
Syntax	< Long > :measure:vmin?	< Short > :meas:vmin?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:vmin?	Selects Channel 1, and then measures the minimum amplitude.

:MEASure:VPP → **Query**

Description	Returns the peak-to-peak amplitude (difference between maximum and minimum amplitude) Same as: Measure key → F1~F5 → F3 (Vpp)	
Syntax	< Long > :measure:vpp?	< Short > :meas:vpp?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:vpp?	Selects Channel 1, and then measures the peak-to-peak amplitude.

:MEASure:VRMS → **Query**

Description	Returns the root-mean-square voltage. Same as: Measure key → F1~F5 → F3 (Vrms)	
Syntax	< Long > :measure:vrms?	< Short > :meas:vrms?
Returns	<NR3>	
Note	Before using this command, select the measurement channel. See the example below.	
Example	:measure:source 1 :measure:vrms?	Selects Channel 1, and then measures the root mean square voltage.

Save/Recall Command

:MEMory<X>:RECall:SETup.....	45
:MEMory<X>:RECall:WAVEform.....	45
:MEMory<X>:SAVe:SETup.....	46
:MEMory<X>:SAVe:WAVEform.....	46
*RCL.....	47
:REF<X>:DISPlay.....	47
:REF<X>:LOCate.....	48
:REF<X>:SAVe.....	48
*SAV.....	49

:MEMory<X>:RECall:SETup Set →

Description	Recalls a panel setting from the internal memory. Same as: Save/Recall key (recall) → F3	
Syntax	< Long >	< Short >
	:memory<x>:recall:setup	:mem<x>:rec:set
Parameter	<X>	Internal memory
	1 ~ 15	S1 ~ S15
Example	:memory1:recall:setup	Recalls the settings from the internal memory S1

:MEMory<X>:RECall:WAVEform Set →

Description	Recalls a waveform from the internal memory and saves it to a reference waveform. Same as: Save/Recall key (recall) → F4	
Syntax	< Long >	< Short >
	:memory<x>:recall:waveform	:mem<x>:rec:wav
	<NR1>	<NR1>
Parameter	<X>	Internal memory

1 ~ 15	W1 ~ W15
<NR1>	Reference waveform
1, 2	RefA, RefB

Example	:memory1:recall:waveform 1	Recalls a waveform from the internal memory W1 and saves it to the reference waveform A
---------	----------------------------	---

:MEMory<X>:SAVe:SETup Set →

Description	Saves the current panel settings to an internal memory. Same as: Save/Recall key (save) → F1	
Syntax	< Long >	< Short >
	:memory<x>:save:setup	:mem<x>:sav:set
Parameter	<X>	Internal memory
	1 ~ 15	S1 ~ S15
Example	:memory1:save:setup	Save the current panel settings to the memory S1

:MEMory<X>:SAVe:WAVEform Set →

Description	Saves a reference waveform to the internal memory. Same as: Save/Recall key (save) → F2	
Syntax	< Long >	< Short >
	:memory<x>:save:waveform	:mem<x>:sav:wav
	<NR1>	<NR1>
Parameter	<X>	Internal memory
	1 ~ 15	W1 ~ W15
	<NR1>	Reference waveform

0	CH1	1	CH2
2	Math	3	RefA
4	RefB		

Example :memory1:save:waveform 1 Saves the reference waveform A to the internal memory W1

***RCL** (Set) →

Description Recalls a set of panel setting from one of the fifteen internal memories, S1 to S15.
Same as: Save/Recall key (recall) → F3

Syntax *rcl <NR1>

Parameter	<NR1>	Settings
	1 to 15	S1 to S15

Example *rcl 1 Recalls the panel settings from S1

:REF<X>:DISPlay (Set) →
→ (Query)

Description Recalls a reference waveform into the display or returns its status.
Same as: Save/Recall key (recall) → F5 → F2 or F3

Syntax < Long > < Short >
:ref<x>:display <Boolean> :ref<x>disp <Boolean>
:ref<x>:display? :ref<x>disp?

Parameter	<X>	Reference	<Boolean>	Reference on/off
	1	A	0	off
	2	B	1	on

Example :ref1:display 1 Turns on the reference waveform A

:REF<X>:LOCate (Set) →
→ (Query)

Description Moves or returns the position of a reference waveform.
Same as: Save/Recall key → F5 → Variable knob

Syntax < Long > < Short >
:ref<x>:locate <NR1> :ref<x>:loc <NR1>
:ref<x>:locate? :ref<x>:loc?

Parameter	<X>	Reference	<NR1>	Position
	1	A	-100 to +100	
	2	B		

Note Before using this command, turn on a reference waveform. See the example below.

Example :ref1:display 1 Turns on the reference waveform A and move it to ±0 position
:ref1:locate 0

:REF<X>:SAVe (Set) →

Description Saves an input signal as a reference waveform.
Same as: Save/Recall key (save) → F2 → F2 → F3

Syntax < Long > < Short >
:ref<x>:save <NR1> :ref<x>sav <NR1>

Parameter	<X>	Reference	<NR1>	Source
	1	A	1	Channel 1
	2	B	2	Channel 2
			3	Math

Example :ref1:save 1 Saves the Channel 1 signal as the reference waveform A

*SAV (Set) →

Description Saves the current panel settings into the internal memory.
Same as: Save/Recall key ↵ → F1

Syntax *sav

Parameter	<NR1>	Internal memory
	1 to 15	S1 to S15

Example *sav 1 Saves the current panel settings into S1

Time (Horizontal) command

:TIMebase:DELay	50
:TIMebase:SCALE.....	50
:TIMebase:SWEEp.....	51
:TIMebase:WINDow:DELay	51
:TIMebase:WINDow:SCALE	52

(Set) →
→ (Query)

:TIMebase:DELay

Description Sets or returns the horizontal delay.

Syntax	< Long >	< Short >
	:timebase:delay <NR3>	:tim:del <NR3>
	:timebase:delay?	:tim:del?

Example :timebase:delay 0 Sets the horizontal delay to 0 sec

(Set) →
→ (Query)

:TIMebase:SCALE

Description Selects or returns the horizontal scale.
Same as: Time/div knob

Syntax	< Long >	< Short >
	:timebase:scale <NR3>	:tim:scal <NR3>

Parameter	s/div	<NR3>	s/div	<NR3>	s/div	<NR3>
	1ns	1e-9	5us	5e-6	25ms	25e-3
	2.5ns	2.5e-9	10us	10e-6	50ms	50e-3
	5ns	5e-9	25us	25e-6	100ms	100e-3
	10ns	10e-9	50us	50e-6	250ms	250e-3
	25ns	25e-9	100us	100e-6	500ms	500e-3

50ns	50e-9	250us	250e-6	1s	1
100ns	100e-9	500us	500e-6	2.5s	2.5
250ns	250e-9	1ms	1e-3	5s	5
500ns	500e-9	2.5ms	2.5e-3	10s	10
1us	1e-6	5ms	5e-3	25s	25
2.5us	2.5e-6	10ms	10e-3	50s	50

Example :timetable:scale 1 Selects 1s/div as the horizontal scale

Set →

:TIMebase:SWEEp

→ Query

Description Selects or returns the horizontal sweep mode.
Same as: Horizontal menu key → F1 ~ F5

Syntax < Long > < Short >
:timebase:sweep <NR1> :tim:swe <NR1>
:timebase:sweep? :tim:swe?

Parameter	<NR1>	Sweep mode	<NR1>	Sweep mode
	0	Main timebase	1	Window
	2	Window zoom	3	Roll mode
	4	XY mode		

Example :timetable:sweep 0 Selects the main timebase as the horizontal sweep mode

Set →

:TIMebase:WINDow:DELay

→ Query

Description Sets or returns the width of the zoomed window.
Same as: Horizontal menu key → F2 (Window) → Time/div knob

Syntax < Long > < Short >
:timebase>window:delay <NR3> :tim:wind:del <NR3>

Example :timetable>window:delay 100 Sets the zoom width to 100 points

Set →

:TIMebase:WINDow:SCALE

→ Query

Description Sets or returns the scale (length) of the zoomed window.
Same as: Horizontal menu key → F3 (zoom)

Syntax < Long > < Short >
:timebase>window:scale <NR3> :tim:wind:scal<NR3>

Example :timetable>window:scale 100 Sets the zoom length to 100 points

Trigger command

:FORCe	53
:RUN	54
:SINGle.....	54
:STOP	54
*TRG.....	54
:TRIGger:COUple.....	54
:TRIGger:FREQuency.....	55
:TRIGger:LEVel.....	55
:TRIGger:MODE.....	55
:TRIGger:NREJ	56
:TRIGger:PULSe:MODE	57
:TRIGger:PULSe:TIME	57
:TRIGger:REject	58
:TRIGger:SLOP.....	58
:TRIGger:STATe	59
:TRIGger:SOURce.....	59
:TRIGger:TYPe.....	60
:TRIGger:VIDeo:FIELD.....	60
:TRIGger:VIDeo:LINE	61
:TRIGger:VIDeo:POLarity	61
:TRIGger:VIDeo:TYPe.....	62

:FORCe

Set →

Description	Manually triggers the GDS-1000A and displays the input signals. Same as: (Trigger) Force key	
Syntax	<Long format>	<Short format>
	:force	:forc

:RUN

Set →

Description	Starts waiting for a trigger condition. Same as: Run key
-------------	---

Syntax	:run
--------	------

:SINGle

Set →

Description	Selects the single trigger mode and starts waiting for a trigger condition. Same as: (Trigger) Single key
-------------	--

Syntax	<Long format>	<Short format>
	:single	:singl

:STOP

Set →

Description	Stops waiting for a trigger condition. Same as: Stop key
-------------	---

Syntax	:stop
--------	-------

*TRG

Set →

Description	Manually triggers the GDS-1000A and displays the input signals. Same as: (Trigger) Force key
-------------	---

Syntax	*trg
--------	------

:TRIGger:COUple

Set →

→ **Query**

Description	Selects or returns the trigger coupling mode. Same as: Trigger menu key → F4 → F2
-------------	--

Syntax	< Long >	< Short >
--------	----------	-----------

	:trigger:couple <NR1>	:trig:coup <NR1>
	:trigger:couple?	:trig:coup?
Parameter	<NR1> Coupling mode	
	1 AC	
	2 DC	
Note	Before using this command, select the edge or pulse trigger. See the example below.	
Example	:trigger:type: 0	Selects the edge trigger
	:trigger:couple 1	and AC coupling mode

:TRIGger:FREQuency →(Query)

Description	Returns the trigger frequency readout.	
Syntax	< Long >	< Short >
	:trigger:frequency?	:trig:freq?

→(Set)→

:TRIGger:LEVel →(Query)

Description	Selects or returns the trigger level. Same as: Trigger level knob	
Syntax	< Long >	< Short >
	:trigger:level <NR3>	:trig:lev <NR3>
	:trigger:level?	:trig:lev?

Parameter	<NR3>	Trigger level in voltage
Example	:trigger:level 0	Sets the trigger level at ±0

→(Set)→

:TRIGger:MODE →(Query)

Description	Selects or returns the trigger mode. Same as: Trigger key → F5	
-------------	---	--

Syntax	< Long >	< Short >
	:trigger:mode <NR1>	:trig:mod <NR1>
	:trigger:mode?	:trig:mod?
Parameter	<NR1>	Trigger mode
	1	Auto
	2	Normal
Note	Before using this command, select the edge or pulse trigger. See the example below.	
Example	:trigger:type: 0	Selects the edge trigger
	:trigger:mode 2	and normal trigger mode

→(Set)→

:TRIGger:NREJ →(Query)

Description	Turns the noise rejection mode on/off. Same as: Trigger key → F4 → F4	
-------------	--	--

Syntax	< Long >	< Short >
	:trigger:nrej <Boolean>	:trig:nrej <Boolean>
	:trigger:nrej?	:trig:nrej?

Parameter	<Boolean>	Noise rejection mode
	0	off
	1	on

Note Before using this command, select the edge or pulse trigger. See the example below.

Example	:trigger:type 0	Selects the edge trigger
	:trigger:nrej 0	and turns off the noise rejection

Set →
 → Query

:TRIGger:PULSe:MODE

Description	Selects the trigger mode in the pulse trigger. Same as: Trigger key → F1(Pulse) → F3		
Syntax	< Long >	< Short >	
	:trigger:pulse:mode <NR1>	:trig:puls:mod <NR1>	
	:trigger:pulse:mode?	:trig:puls:mod?	
Parameter	<NR1>	Mode	<NR1> Mode
	0	<	2 =
	1	>	3 ≠
Note	Before using this command, select the pulse trigger. See the example below.		
Example	:trigger:type 2 :trigger:pulse:mode 0	Selects the pulse trigger and < (smaller than) as the trigger mode	

Set →
 → Query

:TRIGger:PULSe:TIME

Description	Selects the trigger time in the pulse trigger. Same as: Trigger key → F1(Pulse) → F3 → Variable knob		
Syntax	< Long >	< Short >	
	:trigger:pulse:time <NR3>	:trig:puls:tim <NR3>	
	:trigger:pulse:time?	:trig:puls:tim?	
Parameter	<NR3>	Trigger time	
	20e ⁻⁹ ~ 10	20ns ~ 10s	
Note	Before using this command, select the pulse trigger. See the example below.		
Example	:trigger:type 2 :trigger:pulse:time 1	Selects the pulse trigger and sets the trigger time as 1sec	

Set →
 → Query

:TRIGger:REject

Description	Selects the trigger rejection filter. Same as: Trigger key → F4 → F3		
Syntax	< Long >	< Short >	
	:trigger:reject <NR1>	:trig:rej <NR1>	
	:trigger:reject?	:trig:rej?	
Parameter	<NR1>	Rejection filter	
	0	off	
	1	LF	
	2	HF	
Note	Before using this command, select the edge or pulse trigger. See the example below.		
Example	:trigger:type 0 :trigger:reject 1	Selects the edge trigger and LF rejection filter	

Set →
 → Query

:TRIGger:SLOP

Description	Selects the trigger slope. Same as: Trigger key → F4 → F1		
Syntax	< Long >	< Short >	
	:trigger:slop <NR1>	:trig:slop <NR1>	
	:trigger:slop?	:trig:slop?	
Parameter	<NR1>	Trigger slope	
	0	+ (positive)	
	1	- (negative)	
Note	Before using this command, select the edge or pulse trigger. See the example below.		

Example :trigger:type 0 Selects the edge trigger
 :trigger:slop 1 and negative trigger
 slope

:TRIGger:STATe → Query

Description	Queries the present trigger state.	
Syntax	< Long >	< Short >
	:trigger:state?	:trig:stat?
Return Parameter	<NR1>	Trigger state
	0	Un-triggered
	1	Triggered

Note This function is designed for triggering with slow time-bases or for single shot events. This query will return 0 before the trigger point and 1 after a trigger point (if any).
However with quicker time-bases in auto mode, a periodic waveform is constantly re-sampled and thus re-triggered each time, resulting in the query returning 0 before each trigger. Therefore with quicker time bases, this will usually result in 0 being returned, even if the waveform is shown as triggered.

Example :trigger:state? Returns the current
 0 trigger state as un-
 triggered.

:TRIGger:SOURce Set →
→ Query

Description	Selects the trigger source channel. Same as: Trigger key → F2	
Syntax	< Long >	< Short >

 :trigger:source <NR1> :trig:sour <NR1>
 :trigger:source? :trig:sour?

Parameter	<NR1>	Trigger source	<NR1>	Trigger source
	0	Channel 1	2	Line
	1	Channel 2	3	External input

Example :trigger:source 0 Selects Channel 1 as the
 trigger source

:TRIGger:TYPE Set →
→ Query

Description	Selects the trigger type. Same as: Trigger key → F1	
Syntax	< Long >	< Short >
	:trigger:type <NR1>	:trig:typ <NR1>
	:trigger:type?	:trig:typ?

Parameter	<NR1>	Trigger type	<NR1>	Trigger type
	0	Edge	2	Pulse
	1	Video		

Example :trigger:type 0 Selects the edge trigger
 type

:TRIGger:VIDeo:FIELD Set →
→ Query

Description	Selects the trigger field in the video trigger. Same as: Trigger key → F1(Video) → F5	
Syntax	< Long >	< Short >
	:trigger:video:field <NR1>	:trig:vid:fiel <NR1>
	:trigger:video:field?	:trig:vid:fiel?

Parameter	<NR1>	Field	<NR1>	Field
	0	Line	2	even

	1	odd	
Note	Before using this command, select the video trigger. See the example below.		
Example	:trigger:type 1	Selects the video trigger and odd trigger field	
	:trigger:video:field 1		

Set →

→ Query

:TRIGger:VIDeo:LINE

Description	Selects the trigger field line in the video trigger. Same as: Trigger key → F1(Video) → F5 → Variable knob		
Syntax	< Long >	< Short >	
	:trigger:video:line <NR1>	:trig:vid:lin <NR1>	
	:trigger:video:line?	:trig:vid:lin?	
Parameter	<NR1> Line range	<NR1> Line range	
	1 ~ 263 NTSC odd	1 ~ 313 PAL/SECAM odd	
	1 ~ 262 NTSC even	1 ~ 312 PAL/SECAM even	

Note Before using this command, select the video trigger, TV standard, and odd or even trigger field. See the example below.

Example	:trigger:type 1	Selects the video trigger, PAL, odd field triggering, and line 313
	:trigger:video:type 0	
	:trigger:video:field 1	
	:trigger:video:line 313	

Set →

→ Query

:TRIGger:VIDeo:POLarity

Description	Selects the video trigger polarity. Same as: Trigger key → F1(Video) → F4		
Syntax	< Long >	< Short >	

		:trigger:video:polarity <NR1>	:trig:vid:pol <NR1>
		:trigger:video:polarity?	:trig:vid:pol?
Parameter	<NR1>	Polarity	
	0	Positive	
	1	Negative	

Note Before using this command, select the video trigger. See the example below.

Example	:trigger:type 1	Selects the video trigger and positive polarity
	:trigger:video:polarity 0	

Set →

→ Query

:TRIGger:VIDeo:TYPE

Description	Selects the TV standard in the video trigger. Same as: Trigger key → F1(Video) → F3		
Syntax	< Long >	< Short >	
	:trigger:video:type <NR1>	:trig:vid:typ <NR1>	
	:trigger:video:type?	:trig:vid:typ?	
Parameter	<NR1> Type	<NR1> Type	
	0 PAL	2 SECAM	
	1 NTSC		

Note Before using this command, select the video trigger. See the example below.

Example	:trigger:type 1	Selects the video trigger and PAL standard
	:trigger:video:type 0	