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# Digital Storage Oscilloscope

GDS-1000 Series

**PROGRAMMING MANUAL**

**GW INSTEK PART NO.**



ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

October 2007 edition

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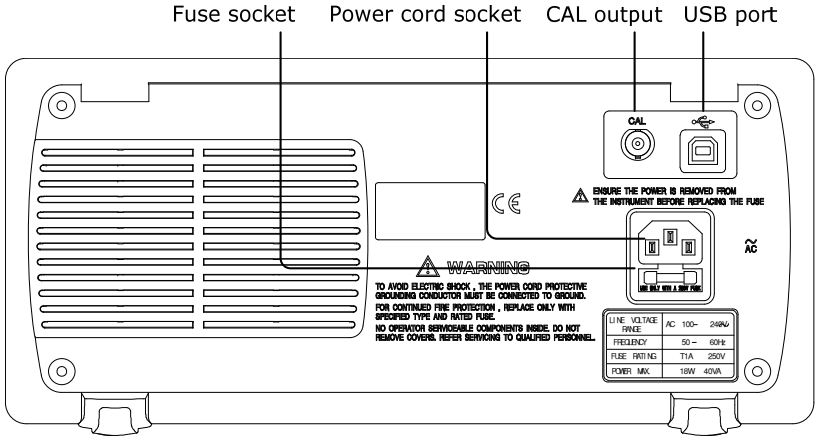




# INTERFACE OVERVIEW

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

## Rear Panel Overview





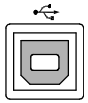

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## Configuring the USB Interface

| | | |
|---|---|---|
| USB connection | PC side connector | Type A, host |
| | GDS-1000 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 website, www.gwinstek.com.tw, GDS-1000 product corner.

3. On the PC, activate a terminal application such as MTTTY (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-1022, 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
- Page12: details of each command






# COMMAND OVERVIEW

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

## Command Syntax

| | | | |
|---|---|---|---|
| Compatible standard | • IEEE488.2, 1992 (fully compatible)<br>• SCPI, 1994 (partially compatible) | | |
| Command format | trig:del:mod <NR1>LF<br>1 2 3 4 | 1: command header<br>2: single space<br>3: parameter<br>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 | line feed code (hexadecimal 0A) with END message | |
| | LF | line feed code | |
| | <dab>∧END | last data byte with END message | |
| Note | Commands are non-case sensitive. | | |



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# List of Command in Functional Order


| | | |
|---|---|---|
| System | *IDN | 13 |
| | *LRN | 13 |
| | *RST | 14 |
| | :SYSTem:ERRor | 14 |
| | :SYSTem:VERSion | 14 |
| Acquisition | :ACQuire:AVERage | 15 |
| | :ACQuire:MODe | 15 |
| | :ACQuire<X>:MEMory | 16 |
| Autoset | :AUToset | 18 |
| Channel / Math | :CHANnel<X>:BWLimit | 19 |
| | :CHANnel<X>:COUPling | 19 |
| | :CHANnel<X>:DISPlay | 20 |
| | :CHANnel<X>:INVert | 20 |
| | :CHANnel<X>:MATH | 21 |
| | :CHANnel<X>:OFFSet | 21 |
| | :CHANnel<X>:PROBe | 22 |
| | :CHANnel<X>:SCALe | 23 |
| Cursor | :CURSor:X<X>Position | 24 |
| | :CURSor:Y<X>Position | 25 |
| | :CURSor:<X>DELta | 25 |
| | :CURSor:<X>DISplay | 26 |
| | :CURSor:SOURce | 27 |
| Display | :DISPlay:ACCumulate | 28 |
| | :DISPlay:CONTrast | 28 |
| | :DISPlay:GRATicule | 29 |
| | :DISPlay:WAVeform | 29 |
| | :REFResh | 30 |







| | | |
|---|---|---|
| Measure | :MEASure:FALL | 31 |
| | :MEASure:FOVShoot | 32 |
| | :MEASure:FPReshoot | 32 |
| | :MEASure:FREQuency | 32 |
| | :MEASure:NWIDth | 33 |
| | :MEASure:PDUTy | 33 |
| | :MEASure:PERiod | 34 |
| | :MEASure:PWIDth | 34 |
| | :MEASure:RISe | 35 |
| | :MEASure:ROVShoot | 35 |
| | :MEASure:RPReshoot | 35 |
| | :MEASure:SOURce | 36 |
| | :MEASure:VAMPlitude | 36 |
| | :MEASure:VAVerage | 37 |
| | :MEASure:VHI | 37 |
| | :MEASure:VLO | 37 |
| | :MEASure:VMAX | 38 |
| | :MEASure:VMIN | 38 |
| | :MEASure:VPP | 39 |
| | :MEASure:VRMS | 39 |
| Save/Recall | :MEMory<X>:RECall:SETup | 40 |
| | :MEMory<X>:RECall:WAVeform | 40 |
| | :MEMory<X>:SAVe:SETup | 41 |
| | :MEMory<X>:SAVe:WAVeform | 41 |
| | *RCL | 42 |
| | :REF<X>:DISPlay | 42 |
| | :REF<X>:LOCate | 43 |
| | :REF<X>:SAVe | 43 |
| | *SAV | 44 |


(Continued on next page)



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| | | |
|---|---|---|
| Time (Horizontal) | :TIMebase:DELay | 45 |
| | :TIMebase:SCALe | 45 |
| | :TIMebase:SWEep | 46 |
| | :TIMebase:WINDow:DELay | 46 |
| | :TIMebase:WINDow:SCALe | 47 |
| Trigger | :FORCe | 48 |
| | :RUN | 48 |
| | :SINGle | 49 |
| | :STOP | 49 |
| | *TRG | 49 |
| | :TRIGger:COUPle | 49 |
| | :TRIGger:FREQuency | 50 |
| | :TRIGger:LEVel | 50 |
| | :TRIGger:MODe | 50 |
| | :TRIGger:NREJ | 51 |
| | :TRIGger:PULSe:MODe | 52 |
| | :TRIGger:PULSe:TIMe | 52 |
| | :TRIGger:REJect | 53 |
| | :TRIGger:SLOP | 53 |
| | :TRIGger:SOURce | 54 |
| | :TRIGger:TYPe | 54 |
| | :TRIGger:VIDeo:FIELd | 55 |
| | :TRIGger:VIDeo:LINe | 55 |
| | :TRIGger:VIDeo:POLarity | 56 |
| | :TRIGger:VIDeo:TYPe | 56 |






# List of Command in Alphabetical Order


| Command | Page |
|---|---|
| A | |
| :ACQuire:AVERage | 15 |
| :ACQuire:MODe | 15 |
| :ACQuire<X>:MEMory | 16 |
| :AUToset | 18 |
| C | |
| :CHANnel<X>:BWLimit | 19 |
| :CHANnel<X>:COUPling | 19 |
| :CHANnel<X>:DISPlay | 20 |
| :CHANnel<X>:INVert | 20 |
| :CHANnel<X>:MATH | 21 |
| :CHANnel<X>:OFFSet | 21 |
| :CHANnel<X>:PROBe | 22 |
| :CHANnel<X>:SCALe | 23 |
| :CURSor:SOURce | 27 |
| :CURSor:X1Position | 24 |
| :CURSor:X2Position | 24 |
| :CURSor:XDELta | 25 |
| :CURSor:XDISplay | 26 |
| :CURSor:Y1Position | 25 |
| :CURSor:Y2Position | 25 |
| :CURSor:YDELta | 25 |
| :CURSor:YDISplay | 26 |
| D | |
| :DISPlay:ACCumulate | 28 |
| :DISPlay:CONTrast | 28 |
| :DISPlay:GRATicule | 29 |
| :DISPlay:WAVeform | 29 |
| F | |
| :FORCe | 48 |
| I | |
| *IDN | 13 |
| L | |
| *LRN | 13 |
| M | |
| :MEASure:FALL | 31 |
| :MEASure:FOVShoot | 32 |
| :MEASure:FPReshoot | 32 |
| :MEASure:FREQuency | 32 |
| :MEASure:NWIDth | 33 |
| :MEASure:PDUTy | 33 |
| :MEASure:PERiod | 34 |
| :MEASure:PWIDth | 34 |
| :MEASure:RISe | 35 |
| :MEASure:ROVShoot | 35 |
| :MEASure:RPReshoot | 35 |
| :MEASure:SOURce | 36 |
| :MEASure:VAMPlitude | 36 |
| :MEASure:VAVerage | 37 |
| :MEASure:VHI | 37 |
| :MEASure:VLO | 37 |
| :MEASure:VMAX | 38 |
| :MEASure:VMIN | 38 |
| :MEASure:VPP | 39 |
| :MEASure:VRMS | 39 |
| :MEMory<X>:RECall:SETup | 40 |
| :MEMory<X>:RECall:WAVeform | 40 |
| :MEMory<X>:SAVe:SETup | 41 |
| :MEMory<X>:SAVe:WAVeform | 41 |
| R | |
| *RCL | 42 |
| :REF<X>:DISPlay | 42 |
| :REF<X>:LOCate | 43 |
| :REF<X>:SAVe | 43 |
| :REFResh | 30 |
| *RST | 14 |
| :RUN | 48 |
| S | |
| *SAV | 44 |
| :SINGle | 49 |
| :STOP | 49 |
| :SYSTem:ERRor | 14 |
| :SYSTem:VERSion | 14 |




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| Command | Page | Command | Page |
|---|---|---|---|
| T | | :TRIGger:NREJ | 51 |
| :TIMebase:DELay | 45 | :TRIGger:PULSe:MODe | 52 |
| :TIMebase:SCALe | 45 | :TRIGger:PULSe:TIMe | 52 |
| :TIMebase:SWEep | 46 | :TRIGger:REJect | 53 |
| :TIMebase:WINDow:DELay | 46 | :TRIGger:SLOP | 53 |
| :TIMebase:WINDow:SCALe | 47 | :TRIGger:SOURce | 54 |
| *TRG | 49 | :TRIGger:TYPe | 54 |
| :TRIGger:COUPle | 49 | :TRIGger:VIDeo:FIELd | 55 |
| :TRIGger:FREQuency | 50 | :TRIGger:VIDeo:LINe | 55 |
| :TRIGger:LEVel | 50 | :TRIGger:VIDeo:POLarity | 56 |
| :TRIGger:MODe | 50 | :TRIGger:VIDeo:TYPe | 56 |






# 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 page7.


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Channel / Math Command ..... 19
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# System command

*IDN ..... 13
*LRN ..... 13
*RST ..... 14
:SYSTem:ERRor ..... 14
:SYSTem:VERSion ..... 14

## *IDN → Query

| | |
|---|---|
| Description | Returns the oscilloscope ID: manufacturer, model name, serial number, and firmware version.<br>Same as: Utility key → F4 |
| Syntax | :idn? |
| Example | :idn?<br>GW, GDS1022, P930116, V0.21<br>Returns the ID for a GDS-1022. |

## *LRN → Query

| | |
|---|---|
| Description | Returns the oscilloscope settings as a data string. |
| Syntax | :lrn? |
| Example | :lrn?<br>:DISPlay:WAVeform 0;DISPCONTrast 500;GRATicule 0;:CURSor:SOURce 1;X1Position ;X2 Position ; Y1Position ;Y2Position ;XDELTa ;YDELTa ;XDISPlay 2;YDISPlay 2;:CHANnel 1:BWLimit 0;COUPling 0;DISPlay 1;INVert 0;MATH 0;OFFSet 2.000e+00; PROBe 0;SCALe 2.000e+00 ;: CHANnel2:BWLimit 0;COUPling 0;DISPlay 1;INVert 0;MATH 0;OFFSet 2.000e+00;PROBe 0;SCALe 2.000e+00;: CHANnel2: BWLimit 0;COUPling 0;DISPlay 1;INVert 0;MA TH 0;OFFSet 2.000e+00;PROBe 0;SCALe 2.000e+00;: CHANnel2:BWLimit 0;COUPling 0;DIS Play 1;INVert 0;MATH 0;OFFSet 2.000e+00;PROBe 0;SCALe 2.000e+00;:CHANnel2:BWLimit 0;COUPling 0;DISPlay 1;INVert 0;MATH 0;OFFSet 2.000e+00;PROBe 0;SCALe 2.000e+00;:TIMebase:DELay 0.000e+00; SCALe 2.500e-06;SWEep0;: AUToset;: REFResh;: RUN;:STOP |





## *RST → Set

| | |
|---|---|
| Description | Resets the GDS-1000 (recalls the default panel settings).<br>Same as: Save/Recall key → F1 |
| Syntax | *rst |

## :SYSTem:ERRor → Query

| | | | | |
|---|---|---|---|---|
| Description | Returns the oscilloscope system error message, if there is any. | | | |
| Syntax | < Long ><br>:system:error? | | < Short ><br>:syst: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?<br>-102 | | Indicates that the command syntax is wrong | |

## :SYSTem:VERSion → Query

| | | |
|---|---|---|
| Description | Returns the oscilloscope firmware version.<br>Same as: Utility key → F4 (only the firmware version) | |
| Syntax | < Long ><br>:system:version? | < Short ><br>:syst:vers? |
| Note | For retrieving all system information including the firmware version, use the *idn? command. | |



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# Acquisition Command

:ACQuire:AVERage..... 15
:ACQuire:MODe ..... 15
:ACQuire<X>:MEMory..... 16

## :ACQuire:AVERage

Set → Query →

| | | | | |
|---|---|---|---|---|
| Description | Selects or returns the average number of waveform acquisition in the average acquisition mode.<br>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<br>:acquire:average 2 | Selects the average acquisition mode, and select the average number 4 | | |

## :ACQuire:MODe

Set → Query →

| | | |
|---|---|---|
| Description | Selects or returns the acquisition mode.<br>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<br>:acquire:average 2 | Selects the average acquisition mode, and select the average number 4 |

## :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> | Channel | |
| | 1/2 | Channel1/2 | |
| Example | :acquire1:memory? | | Returns the channel 1 waveform data |

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 always 4.







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**Data size**

Indicates the data size. The data size is always 8008 (4000 points per channel).

**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 8000 data points. Each point is made up of 2 bytes (16 bits), high byte (MSD) first.





# Autoset Command

## :AUToset

Set

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



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# Channel / Math Command


:CHANnel<X>:BWLimit ..... 19
:CHANnel<X>:COUPling ..... 19
:CHANnel<X>:DISPlay ..... 20
:CHANnel<X>:INVert ..... 20
:CHANnel<X>:MATH ..... 21
:CHANnel<X>:OFFSet ..... 21
:CHANnel<X>:PROBe ..... 22
:CHANnel<X>:SCALe ..... 23


## :CHANnel<X>:BWLimit

Set → Query

| | | | | |
|---|---|---|---|---|
| Description | Selects or returns the bandwidth limit on/off.<br>Same as: Channel key → F3 | | | |
| Syntax | < Long > | | < Short > | |
| | :channel<X>:bwlimit <Boolean><br>:channel<X>:bwlimit? | | :chan<X>:bwl <Boolean><br>:chan:bwl? | |
| Parameter | <X> | Channel | <NR1> | Limit |
| | 1/2 | CH1/2 | 0 | Off |
| | | | 1 | On |
| Example | :channel1:bwlimit 1 | | Turns on the bandwidth limit for Channel 1 | |

## :CHANnel<X>:COUPling

Set → Query

| | | | | |
|---|---|---|---|---|
| Description | Selects or returns the coupling mode.<br>Same as: Channel key → F1 | | | |
| Syntax | < Long > | | < Short > | |
| | :channel<X>:coupling <NR1><br>:channel<X>:coupling? | | :chan<X>:coup <NR1><br>:chan:coup? | |
| Parameter | <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 | |





## :CHANnel<X>:DISPlay

Set → Query

| | | | | |
|---|---|---|---|---|
| Description | Turns a channel on/off or returns its status.<br>Same as: Channel key | | | |
| Syntax | < Long > | | < Short > | |
| | :channel<X>:display <Boolean><br>:channel<X>:display? | | :chan<X>:disp <Boolean><br>:chan<X>:disp? | |
| Parameter | <X> | Channel | <NR1> | Channel on/off |
| | 1/2 | CH1/2 | 0 | Off |
| | | | 1 | On |
| Example | :channel1:display 1 | | Turns on Channel 1 | |

## :CHANnel<X>:INVert

Set → Query

| | | | | |
|---|---|---|---|---|
| Description | Inverts a channel or returns its status.<br>Same as: Channel key → F2 | | | |
| Syntax | < Long > | | < Short > | |



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| | | | | |
|---|---|---|---|---|
| | :channel<X>:invert <Boolean><br>:channel<X>:invert? | | :chan<X>:inv <Boolean><br>:chan<X>:inv? | |
| Parameter | <X> | Channel | <NR1> | Channel invert |
| | 1/2 | CH1/2 | 0 | off |
| | | | 1 | on |
| Example | :channel1:invert 1 | | Inverts Channel 1 | |

## :CHANnel<X>:MATH

Set → Query →

| | | | | |
|---|---|---|---|---|
| Description | Selects or returns the math operation type.<br>Same as: Math key → F1 | | | |
| Syntax | < Long ><br>:channel<X>:math <NR1><br>:channel<X>:math? | | < Short ><br>:chan<X>:math <NR1><br>:chan<X>:math? | |
| Parameter | <X> | Channel | <NR1> | Math operation |
| | 1/2 | CH1 or CH2 | 0 | Math off |
| | | | 1 | Add |
| | | | 2 | Subtract |
| | | | 3 | FFT |
| Example1 | :channel1:math 2 | | Channel 1 – Channel 2 | |
| Example2 | :channel2:math 2 | | Channel 1 – Channel 2 | |
| Example3 | :channel2:math 2 | | Runs FFT on Channel 2 | |

## :CHANnel<X>:OFFSet

Set → Query →

| | |
|---|---|
| Description | Sets or returns the offset level for a channel. The offset level range depends on the vertical scale. |





| | | | | |
|---|---|---|---|---|
| Syntax | < Long ><br>:channel<X>:offset <NR3><br>:channel<X>:offset? | | < Short ><br>:chan<X>:offs <NR3><br>:chan<X>:offs? | |
| Parameter | <X> | Channel | <NR3> | Offset level |
| | 1/2 | CH1/2 | ±0.5 | –0.5V ~ +0.5V (2mV/div~50mV/div) |
| | | | ±5.0 | –5.0V ~ +5.0V (100mV/div~500mV/div) |
| | | | ±50.0 | –50.0V ~ +50.0V (1V/div ~ 5V/div) |
| Example | :channel1:scale 1.00e–2<br>:channel1:offset 2.00e–2 | | Sets the Channel 1 scale to 10mV/div<br>Sets the Channel 1 offset to 20mV | |

## :CHANnel<X>:PROBe

Set → Query →

| | | | | |
|---|---|---|---|---|
| Description | Sets or returns the probe attenuation factor.<br>Same as: Channel key → F4 | | | |
| Syntax | < Long ><br>:channel<X>:probe <NR3><br>:channel<X>:probe? | | < Short ><br>:chan<X>:prob <NR1><br>: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 | |



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## :CHANnel<X>:SCALe

Set → / → Query

| | | | | |
|---|---|---|---|---|
| Description | Sets or returns the vertical scale. The scale depends on the probe attenuation factor.<br>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 ~ 5V (Probe x1) |
| | | | 2e–2 ~ 5e+1 | 20mV ~ 50V (Probe x10) |
| | | | 2e–1 ~ 5e+2 | 200mV ~ 500V (Probe x100) |
| Example | :channel1:probe 0<br>:channel1:scale 2.00e–3 | | Sets the Channel 1 probe attenuation factor to x1<br>Sets the Channel 1 vertical scale to 2mV/div | |





# Cursor Command


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## :CURSor:X<X>Position

Set → / → Query

| | | | | |
|---|---|---|---|---|
| Description | Sets or returns the horizontal (X axis) cursor position.<br>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 | 1 ~ 249 point |
| | 2 | Cursor X2 | | |
| Note | When in the query mode, the returned data format is <NR3> as follows.<br>CH1, CH2, Math (CH1±CH2): time (s)<br>Math (FFT): frequency (Hz) | | | |
| Example | :cursor:xdisplay 1<br>:cursor:x1position 100 | | Puts the horizontal cursor X1 on the 100 point position | |
| | :channel:math 3<br>:cursor:xdisplay 1<br>:cursor:x1position?<br>→ 2.500E+03 | | Returns the X1 cursor position as 2500Hz in the Math FFT mode | |



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## :CURSor:Y<X>Position

Set → / → Query

| | | | | |
|---|---|---|---|---|
| Description | Selects or returns the vertical (Y axis) cursor position.<br>Same as: Cursor key →F5 (X-Y) → F2(Y1) or F3(Y2) + Vertical knob | | | |
| Syntax | < Long ><br>:cursor:y<X>position <NR1><br>:cursor:y<X>position? | | < Short ><br>:curs:y<X>p <NR1><br>: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.<br>CH1, CH2, Math (CH1±CH2): voltage (V)<br>Math (FFT): decibel (dB) | | | |
| Example | :cursor:ydisplay 1<br>:cursor:y1position 100 | Puts the vertical cursor Y1 on the 100 point position | | |
| | :channel:math 3<br>:cursor:ydisplay 1<br>:cursor:y1position?<br>→ 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.<br>Same as: Cursor key →F5 (X-Y) → F4 |





| | | | |
|---|---|---|---|
| Syntax | < Long ><br>:cursor:<X>delta? | | < Short ><br>: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.<br>CH1, CH2, Math (CH1±CH2): time (s) for horizontal cursor, voltage (V) for vertical cursor<br>Math (FFT): frequency (Hz) for horizontal cursor, decibel (dB) for vertical cursor | | |
| Example | :channel:math 3<br>:cursor:xdisplay 1<br>:cursor:xdelta?<br>→ 2.500E+03 | Returns the frequency (2500Hz) between the two horizontal cursors in the Math FFT mode | |
| | :channel:math 3<br>:cursor:ydisplay 1<br>:cursor:ydelta?<br>→ 2.500E+00 | Returns the decibel (2.5dB) between the two vertical cursors in the Math FFT mode | |

## :CURSor:<X>DISplay

Set →

| | | | | |
|---|---|---|---|---|
| Description | Turns the horizontal or vertical cursors on/off.<br>Same as: Cursor key | | | |
| Syntax | < Long ><br>:cursor:y<X>display <Boolean> | | < Short ><br>: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 | | |



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## :CURSor:SOURce

Set → Query

| | | |
|---|---|---|
| Description | Selects or returns the cursor source channel.<br>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


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## :DISPlay:ACCumulate

Set → Query

| | | |
|---|---|---|
| Description | Turns the display accumulate mode on/off or returns its status.<br>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 |

## :DISPlay:CONTrast

Set → Query

| | | |
|---|---|---|
| Description | Sets or returns the display contrast level.<br>Same as: Display key → F4 | |
| Syntax | < Long > | < Short > |
| | :display:contrast <NR1> | :disp:cont <NR1> |
| | :display:contrast? | :disp:cont? |



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| | | |
|---|---|---|
| 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

Set → / → Query

| | | |
|---|---|---|
| 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

Set → / → Query

| | | |
|---|---|---|
| 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 |



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# Measure command


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## :MEASure:FALL → Query

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





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

## :MEASure:FOVShoot → Query

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

## :MEASure:FPReshoot → Query

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

## :MEASure:FREQuency → Query



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

## :MEASure:NWIDth → Query

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

## :MEASure:PDUTy → Query

| | | |
|---|---|---|
| Description | Returns the positive duty cycle ratio.<br>Same as: Measure key → F1~F5 → F3 (DutyCycle) | |
| Syntax | < Long ><br>:measure:pduty? | < Short ><br>:meas:pdut? |
| Returns | <NR2> as the percentage | |





| | | |
|---|---|---|
| Note | Before using this command, select the measurement channel. See the example below. | |
| Example | :measure:source 1<br>:measure:pduty? | Selects Channel 1, and then measures the positive duty cycle. |

## :MEASure:PERiod → Query

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

## :MEASure:PWIDth → Query

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



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## :MEASure:RISe → Query

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

## :MEASure:ROVShoot → Query

| | | |
|---|---|---|
| Description | Returns rise overshoot amplitude in percentage.<br>Same as: Measure key → F1~F5 → F3 (ROVShoot) | |
| Syntax | < Long ><br>:measure:rovshoot? | < Short ><br>:meas:rovs? |
| Returns | <NR2> with % sign | |
| Note | Before using this command, select the measurement channel. See the example below. | |
| Example | :measure:source 1<br>:measure:rovshoot? | Selects Channel 1, and then measures the rise overshoot. |

## :MEASure:RPReshoot → Query

| | | |
|---|---|---|
| Description | Returns rise overshoot amplitude in percentage.<br>Same as: Measure key → F1~F5 → F3 (RPReshoot) | |
| Syntax | < Long ><br>:measure:rpreshoot? | < Short ><br>:meas:rpr? |
| Returns | <NR2> with % sign | |
| Note | Before using this command, select the measurement channel. See the example below. | |
| Example | :measure:source 1<br>:measure:rpreshoot? | Selects Channel 1, and then measures the rise preshoot. |





## :MEASure:SOURce → Set / → Query

| | | |
|---|---|---|
| Description | Selects the measurement channel.<br>Same as: Measure key → F1~F5 → F1, F2 | |
| Syntax | < Long ><br>:measure:source <NR1><br>:measure:source? | < Short ><br>:meas:sour <NR1><br>:meas:sour? |
| Parameter | <NR1><br>1 ~ 2 Channel1 ~ 2 | |
| Example | :measure:source 1<br>:measure:rprshoot? | Selects Channel 1, and then measures the rise preshoot. |

## :MEASure:VAMPlitude → Query

| | | |
|---|---|---|
| Description | Returns the voltage difference between positive and negative peak.<br>Same as: Measure key → F1~F5 → F3 (Vamp) | |
| Syntax | < Long ><br>:measure:vamplitude? | < Short ><br>:meas:vamp? |
| Returns | <NR3> | |
| Note | Before using this command, select the measurement channel. See the example below. | |



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| | | |
|---|---|---|
| Example | :measure:source 1<br>:measure:vamplitude? | Selects Channel 1, and then measures the rise Voltage amplitude. |

## :MEASure:VAVerage → Query

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

## :MEASure:VHI → Query

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

## :MEASure:VLO → Query





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

## :MEASure:VMAX → Query

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

## :MEASure:VMIN → Query

| | | |
|---|---|---|
| Description | Returns the minimum amplitude.<br>Same as: Measure key → F1~F5 → F3 (Vmin) | |
| Syntax | < Long ><br>:measure:vmin? | < Short ><br>:meas:vmin? |
| Returns | <NR3> | |



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

## :MEASure:VRMS → Query

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





# Save/Recall Command


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*SAV .....44


## :MEMory<X>:RECall:SETup Set →

| | | | |
|---|---|---|---|
| Description | Recalls a panel setting from the internal memory.<br>Same as: Save/Recall key (recall) → F3 | | |
| Syntax | < Long ><br>:memory<x>:recall:setup | | < Short ><br>:mem<x>:rec:set |
| Parameter | <X><br>1 ~ 15 | Internal memory<br>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.<br>Same as: Save/Recall key (recall) → F4 | | |
| Syntax | < Long ><br>:memory<x>:recall:waveform <NR1> | | < Short ><br>:mem<x>:rec:wav <NR1> |
| Parameter | <X> | Internal memory | |



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| | | |
|---|---|---|
| | 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.<br>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.<br>Same as: Save/Recall key (save) → F2 | |
| Syntax | < Long > | < Short > |
| | :memory<x>:save:waveform <NR1> | :mem<x>:sav:wav <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.<br>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.<br>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 |



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| | | |
|---|---|---|
| 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.<br>Same as: Save/Recall key → F5 → Variable knob | | | |
| Syntax | < Long ><br>:ref<x>:locate <NR1><br>:ref<x>:locate? | | < Short ><br>:ref<x>:loc <NR1><br>: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<br>:ref1:locate 0 | Turns on the reference waveform A and move it to ±0 position | | |

## :REF<X>:SAVe

Set →

| | | | | |
|---|---|---|---|---|
| Description | Saves an input signal as a reference waveform.<br>Same as: Save/Recall key (save) → F2 → F2 → F3 | | | |
| Syntax | < Long ><br>:ref<x>:save <NR1> | | < Short ><br>: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.<br>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 | |



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# Time (Horizontal) command

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:TIMebase:SCALe ..... 45
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## :TIMebase:DELay

Set → / → Query

| | | |
|---|---|---|
| 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 |

## :TIMebase:SCALe

Set → / → Query

| | | | | | | |
|---|---|---|---|---|---|---|
| Description | Selects or returns the horizontal scale.<br>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 | $5e^{-3}$ | | |
| 2.5us | $2.5e^{-6}$ | 10ms | $10e^{-3}$ | | |

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

## :TIMebase:SWEep

Set → / → Query

| | | | | |
|---|---|---|---|---|
| Description | Selects or returns the horizontal sweep mode.<br>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 | |

## :TIMebase:WINDow:DELay

Set → / → Query



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| | | |
|---|---|---|
| Description | Sets or returns the width of the zoomed window.<br>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 |

## :TIMebase:WINDow:SCALe

Set → Query

| | | |
|---|---|---|
| Description | Sets or returns the scale (length) of the zoomed window.<br>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


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## :FORCe

Set →

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

## :RUN

Set →



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| | |
|---|---|
| Description | Starts waiting for a trigger condition.<br>Same as: Run key |
| Syntax | :run |

## :SINGle

Set →

| | | |
|---|---|---|
| Description | Selects the single trigger mode and starts waiting for a trigger condition.<br>Same as: (Trigger) Single key | |
| Syntax | <Long format> | <Short format> |
| | :single | :singl |

## :STOP

Set →

| | |
|---|---|
| Description | Stops waiting for a trigger condition.<br>Same as: Stop key |
| Syntax | :stop |

## *TRG

Set →

| | |
|---|---|
| Description | Manually triggers the GDS-1000 and displays the input signals.<br>Same as: (Trigger) Force key |
| Syntax | *trg |

## :TRIGger:COUPle

Set →
→ Query

| | | |
|---|---|---|
| Description | Selects or returns the trigger coupling mode.<br>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<br>:trigger:couple 1 | Selects the edge trigger and AC coupling mode |

## :TRIGger:FREQuency

→ Query

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

## :TRIGger:LEVel

Set →
→ Query

| | | |
|---|---|---|
| Description | Selects or returns the trigger level.<br>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 |

## :TRIGger:MODe

Set →
→ Query



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| | | |
|---|---|---|
| Description | Selects or returns the trigger mode.<br>Same as: Trigger key → F5 | |
| Syntax | < Long ><br>:trigger:mode <NR1><br>:trigger:mode? | < Short ><br>:trig:mod <NR1><br>: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<br>:trigger:mode 2<br>Selects the edge trigger and normal trigger mode |

## :TRIGger:NREJ

Set → Query

| | | |
|---|---|---|
| Description | Turns the noise rejection mode on/off.<br>Same as: Trigger key → F4 → F4 | |
| Syntax | < Long ><br>:trigger:nrej <Boolean><br>:trigger:nrej? | < Short ><br>:trig:nrej <Boolean><br>: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<br>:trigger:nrej 0<br>Selects the edge trigger and turns off the noise rejection |





## :TRIGger:PULSe:MODe

Set → Query

| | | |
|---|---|---|
| Description | Selects the trigger mode in the pulse trigger.<br>Same as: Trigger key → F1(Pulse) → F3 | |
| Syntax | < Long ><br>:trigger:pulse:mode <NR1><br>:trigger:pulse:mode? | < Short ><br>:trig:puls:mod <NR1><br>: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<br>:trigger:pulse:mode 0<br>Selects the pulse trigger and < (smaller than) as the trigger mode |

## :TRIGger:PULSe:TIMe

Set → Query

| | | |
|---|---|---|
| Description | Selects the trigger time in the pulse trigger.<br>Same as: Trigger key → F1(Pulse) → F3 → Variable knob | |
| Syntax | < Long ><br>:trigger:pulse:time <NR3><br>:trigger:pulse:time? | < Short ><br>:trig:puls:tim <NR3><br>: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. |



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| | | |
|---|---|---|
| Example | :trigger:type 2<br>:trigger:pulse:time 1 | Selects the pulse trigger and sets the trigger time as 1sec |

## :TRIGger:REJect

Set → Query

| | | |
|---|---|---|
| Description | Selects the trigger rejection filter.<br>Same as: Trigger key → F4 → F3 | |
| Syntax | < Long ><br>:trigger:reject <NR1><br>:trigger:reject? | < Short ><br>:trig:rej <NR1><br>: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<br>:trigger:reject 1 | Selects the edge trigger and LF rejection filter |

## :TRIGger:SLOP

Set → Query

| | | |
|---|---|---|
| Description | Selects the trigger slope.<br>Same as: Trigger key → F4 → F1 | |
| Syntax | < Long ><br>:trigger:slop <NR1><br>:trigger:slop? | < Short ><br>:trig:slop <NR1><br>:trig:slop? |

| Parameter | | |
|---|---|---|
| | <NR1> | Trigger slope |
| | 0 | + (positive) |





| Parameter | | |
|---|---|---|
| | 1 | – (negative) |

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

| | | |
|---|---|---|
| Example | :trigger:type 0<br>:trigger:slop 1 | Selects the edge trigger and negative trigger slope |

## :TRIGger:SOURce

Set → Query

| | | |
|---|---|---|
| Description | Selects the trigger source channel.<br>Same as: Trigger key → F2 | |
| Syntax | < Long ><br>:trigger:source <NR1><br>:trigger:source? | < Short ><br>:trig:sour <NR1><br>: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.<br>Same as: Trigger key → F1 | |
| Syntax | < Long ><br>:trigger:type <NR1><br>:trigger:type? | < Short ><br>:trig:typ <NR1><br>:trig:typ? |

| Parameter | | | | |
|---|---|---|---|---|
| | <NR1> | Trigger type | <NR1> | Trigger type |
| | 0 | Edge | 2 | Pulse |



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| | | |
|---|---|---|
| | 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.<br>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<br>:trigger:video:field 1 | Selects the video trigger and odd trigger field | | |

## :TRIGger:VIDeo:LINe

Set → Query

| | | | | |
|---|---|---|---|---|
| Description | Selects the trigger field line in the video trigger.<br>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<br>:trigger:video:type 0<br>:trigger:video:field 1<br>:trigger:video:line 313 | Selects the video trigger, PAL, odd field triggering, and line 313 | | |

## :TRIGger:VIDeo:POLarity

Set → Query

| | | | |
|---|---|---|---|
| Description | Selects the video trigger polarity.<br>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<br>:trigger:video:polarity 0 | Selects the video trigger and positive polarity | |

## :TRIGger:VIDeo:TYPe

Set → Query

| | | |
|---|---|---|
| Description | Selects the TV standard in the video trigger.<br>Same as: Trigger key → F1(Video) → F3 | |
| Syntax | < Long > | < Short > |



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| | | | | |
|---|---|---|---|---|
| | :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<br>:trigger:video:type 0 | Selects the video trigger and PAL standard | | |



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