Digital Oscilloscope

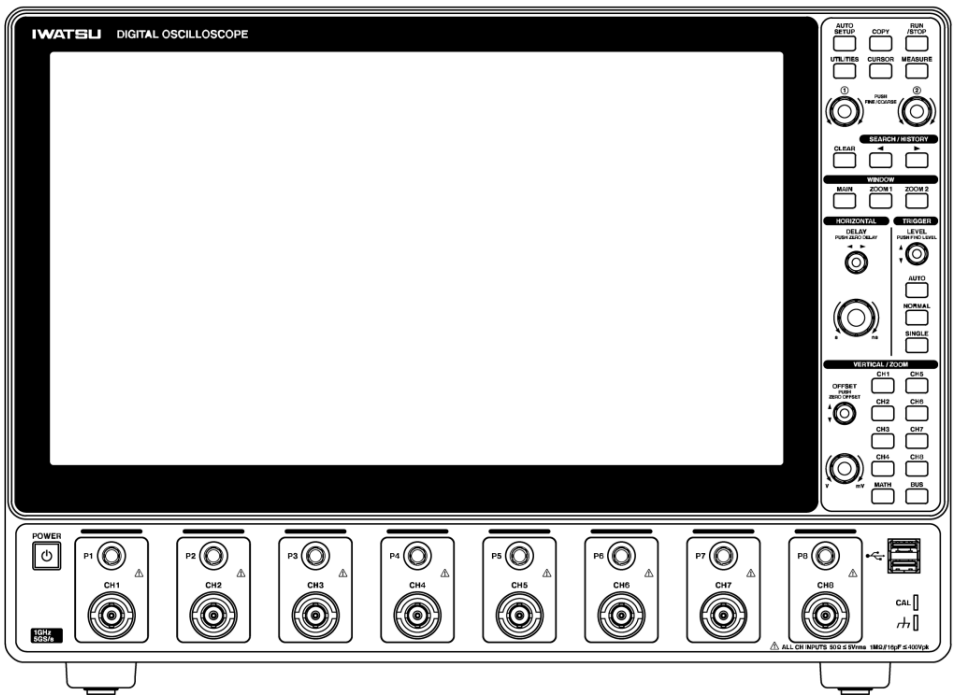
DS-8000 Series

DS-8108/8104/8058/8054

8038/8034

Remote Control Manual

*** To view the Instruction Manual, see the PDF file in the Manual CD.**



IWATSU

Preface

- Thank you for purchasing the Digital Oscilloscope DS-8000 Series. We sincerely hope to continue using our instruments for a long time.
- Before using the instrument, thoroughly read the Instruction Manual to fully understand its contents. After reading the Instruction Manual and this Remote Control Manual, keep them in a safe place for future reference.
- The Remote Control Manual describes description of remote controls that use USB or LAN interface. See the Instruction Manual describes coutions on handling, operating procedures, operation examples, and specifications of the instrument in detail.
- In the content of the manual, it explains based on 8CH model. When it is necessary to explain the obvious difference between 4CH model and 8CH model, the manual explains in each part.
- This manual is compatible with firmware Ver. 6.08

Important Safety Precautions

To ensure safe operation of the instrument and to prevent injury to the user or damage to property, read and carefully observe ⚠ WARNING and ⚠ CAUTION in the Instruction Manual.

WARNING	Incorrect operation or failure to observe a warning may result in death or serious injury.
CAUTION	Incorrect operation or failure to observe a caution may result in bodily injury or damage to the instrument.

Explanation of the symbol on the panel

General CAUTION	The symbol warns you to carefully read relevant descriptions of the Instruction Manual before operating a part with the symbol put in order to protect the operator from injury and the instrument from damage.

Notices

- ◇ Some of the contents of the Remote Control Manual may be modified without notice for improvements in specifications and function.
- ◇ Reproduction or reprinting of the contents of the Remote Control Manual without prior permission from IWATSU is prohibited.
- ◇ If any question arises about the instrument, contact IWATSU or our sales distributors.

Revision History

◇July 2021 : 1st Edition
◇Nobember 2021 : 2nd Edition
◇April 2022 : 3rd Edition
◇October 2022 : 4th Edition
◇January 2023 : 5th Edition
◇March 2023 : 6th Edition

Document Number

◇KMLA00346

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Contents

1. Overview

With remote control, you can use an external controller (usually a computer) to perform operations equivalent to manually operating the buttons and knobs of the instrument.

Remote control not only performs simple operations, but also transfers waveform data, screen data, setting data, and so on. In addition, you can configure an automatic measurement system.

2. Remote Control

The remote control uses USB or LAN interfaces as remote interfaces.

The interface used remotely is set in the "Remote Window". Refer to Instruction Manual and the following sections for the setting and control method of each interface.

Communications setup on computer side

For remote control via LAN or USB interface, set the communication settings of the control software as follows.

Item	Setting
Port number (connects to)	5198
Delimiter (transmit Note 1)	CR, LF, or CR+LF
Delimiter (receive Note 2)	LF

Note 1: The means that the computer transmits data to the instrument.

Note 2: The means that the computer receives data from the instrument.

Network connection

Before connecting an oscilloscope to a network, request the required information from the network administrator. When an invalid address is specified for the network, unexpected operations may occur both on the network and in the oscilloscope.

Note: The default gateway is assigned to "192.168.1.1". When the gateway is not being used by the network, then the computer and the oscilloscope must exist in the same sub net.

2.1. Remote Control by USB Interface

A USB interface can be used for remote control of the oscilloscope by connecting a computer to the USB port on the oscilloscope's side panel. The USB driver needs to be installed for connection. The USB driver can be installed with the application "Iwatsu Test Instruments Tools" available on our website (URL: http://www.iti.iwatsu.co.jp/index_e.html). The application is also available at the same time. Please refer to the application for details.

Use a USB cable (A: B type) for USB 3.0 to connect the oscilloscope to a computer. When connected to a computer with a USB3.0 cable, the product is recognized as a network adapter. The network adapter must be configured at on the computer side.

Note: When using the oscilloscope with remote control via USB in a noisy environment, a noise-resistant cable may be necessary.

2.1.1. The oscilloscope's USB Interface settings

Tap the MENU button (top-right of screen) to open Menu Window.

Tap Remote from the Menu Window. Open the Remote Window (see Figure 1) and set setting items.

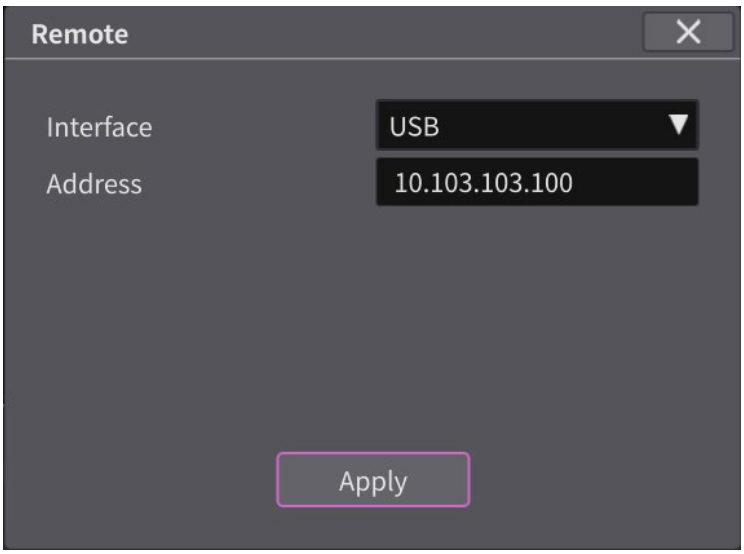


Figure 1 Remote Window

2.1.2. Interface

Select the Interface to USB.

2.1.3. Address

Enter the Address that can be connected to the computer.

2.1.4. Apply

Tap the “Apply” and apply the setting.

2.2. Remote control by LAN Interface

By connecting the Ethernet port on the side panel to your computer, you can remotely control the oscilloscope using the LAN interface.

Applications that can be used with a computer can be obtained from the IWATSU website (URL: https://www.iti.iwatsu.co.jp/index_e.html). Please visit the website for details.

When connecting the oscilloscope directly to a computer, use a cross-connected Ethernet cable.

2.2.1. The oscilloscope's LAN Interface settings

From the Remote Window, set Interface to LAN. Each setting items are shown in Figure 2.

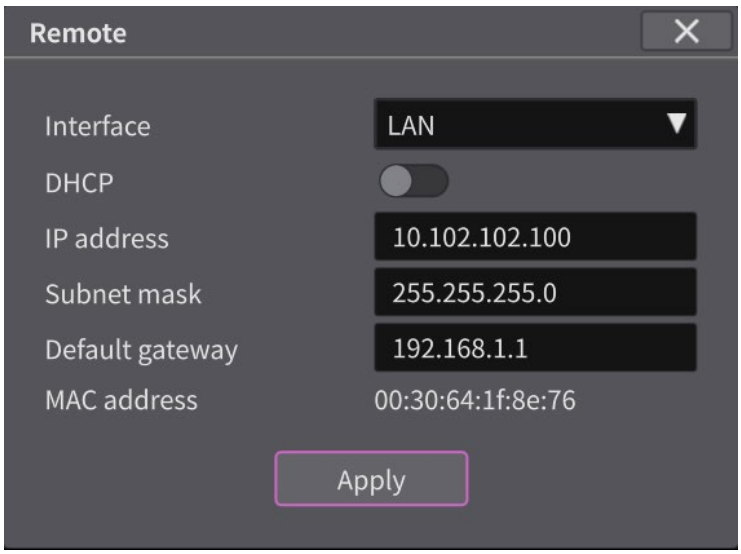


Figure 2 Remote Window for LAN Interface

2.2.2. Interface

Select the Interface to LAN.

2.2.3. DHCP

Set the DHCP function to "ON" or "OFF".

Input method: Toggle Switch.

When set to "ON", the information required for connection is automatically acquired. Check with the administrator of the connecting network to see When DHCP is available.

When set to "OFF", set "IP address", "Subnet mask", and "Default gateway".

2.2.4. IP address

Setting is required when DHCP is "OFF".

2.2.5. Subnet mask

Setting is required when DHCP is "OFF".

2.2.6. Default gateway

Setting is required when DHCP is "OFF".

2.2.7. Apply

Tap the “Apply” and apply the setting.

2.3. Remote Command

To remotely control the oscilloscope, program messages are sent from the controller (computer) according to the Data Format structure.

Remote commands used with the oscilloscope comply with the IEEE 488.2

In this manual, the elements stipulated by the IEEE488.2 standard appear as shown below.

Element
<PROGRAM MESSEGE>
<CHARACTER PROGRAM DATA>
<CHARACTER RESPONSE DATA>
<DECIMAL NUMERIC PROGRAM DATA>
<SUFFIX PROGRAM DATA>
<STRING PROGRAM DATA>
<ARBITRARY BLOCK PROGRAM DATA>
<RESPONSE MESSAGE>
<NR1 NUMERIC RESPONSE DATA>
<NR3 NUMERIC RESPONSE DATA>
<DEFINITE LENGTH ARBITRARY BLOCK DATA>
<ARBITRARY ASCII RESPONS DATA>

2.4. Status Register Configuration

2.4.1. Status Byte Register

The register can be read only by an *STB? Query

The register has an 8-bit configuration and its contents are as follows.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved	RQS/MSS	ESB	MAV	Reserved	Reserved	Reserved	TRG

Bit Number	Description
Bit 7 Reserved	Always 0.
Bit 6 RQS/MSS	With serial polling operations, this is returned as Bit 6 of the status byte. This Bit is set when the logical OR of all bits as a result of masking the other bits in the Status Byte Register with the status byte register changes from 0 to 1. This bit is cleared at power-on or during serial polling operations.
Bit 5 ESB	This is returned as Bit 5 of *STB? Query response. It is a summary message for the standard event status register.
Bit 4 MAV	This is returned as Bit 4 of *STB? Query response. It is a summary message for the output queue.
Bit 3 Reserved	Always 0.
Bit 2 Reserved	Always 0.
Bit 1 Reserved	Always 0.
Bit 0 TRG	This is returned as Bit 0 of the serial poll or *STB? Query response. It is a summary message for the trigger event status register.

Service Request Enable Register

The register is used to mask the Status Byte Register. Either the RQS or MSS bit is set, according to the masked result. Therefore, it affects service request. The mask pattern can be set using the *SRE Command and queried using the *SRE? Query. The register contents are cleared (to 0) when the power is turned ON. Device clearing and the *CLS Command are not affected by the register.

2.4.2. Standard Event Status Register

The register is specified under the IEEE488.2 standard. It can be queried by the *ESR? Query. The register contents are reflected in real time in the ESB bit of the status byte register, as the logical OR result of all masked bits in the Standard Event Status Enable Register. The register contents can be set using a *CLS Command or queried *ESR? Query, which they are cleared (to 0).

The register has an 8-bit configuration, and includes the following.

Bit Number	Description
Bit 7 PON	1 is set at power-on.
Bit 6 Reserved	Always 0.
Bit 5 CME	1 is set when a command-execution error occurs. It indicates an error in the command syntax.
Bit 4 EXE	1 is set when an execution error has occurred. It indicates that command execution failed or did not end normally.
Bit 3 DDE	1 is set when a device-specific error has occurred. It indicates an error that is specific to the oscilloscope.
Bit 2 QYE	1 is set when a query error has occurred. It indicates an error such as when the controller attempts to read a message from the device without sending a query command, or when it sent the next message before completely reading the response message.
Bit 1 Reserved	Always 0.
Bit 0 OPC	1 is set when an operation is complete. The *OPC command supports the controller/device synchronization function.

Standard Event Status Enable Register

The register is used to mask the Standard Event Status Register. The ESB bit in the status byte register is set according to the masked result. The mask pattern can be set using the *ESE Command and queried using the *ESE? Query. The register contents are cleared (to 0) when the power is turned ON. Device clearing and the *CLS Command are not affected by the register.

Output queue

The output queue is the output buffer used to store response messages sent to the controller. Response messages for various types of queries are stored in the output queue. As long as there is at least 1 byte of data in the output queue, the MAV bit is set to 1 in the status byte register. The output queue is cleared (emptied) by a device clear operation and at power-on. If a new program message is sent before the controller has read all of the data bytes and while the output queue is not yet empty, a query error occurs and the output queue is cleared.

2.4.3 Trigger Event Status Register

The event register is used to report completion of single measurements. The logical OR of all bits resulting from masking the contents of the register with the Trigger Event Status Enable Register is reflected in the TRG bit of the status byte register in real time. The register uses the least significant bit. The other bit is always 0. The query corresponding to the register is TESR? The register contents are cleared (to 0) when the power is turned ON.

The register has an 8-bit configuration, and includes the following.

Bit Number	Description
Bit 7 Reserved	Always 0
Bit 6 Reserved	Always 0
Bit 5 Reserved	Always 0
Bit 4 Reserved	Always 0
Bit 3 Reserved	Always 0
Bit 2 Reserved	Always 0
Bit 1 Reserved	Always 0
Bit 0 SWE	”1” when single measurement end. ”0” when the power is turned on

Trigger Event Status Enable Register

The register is used to mask the Trigger Event Status Register. The TRG bit in the status byte register is set according to the masked result. The mask pattern can be set using the TESE Command and queried using the TESE? Query. The register contents are cleared (to 0) when the power is turned on. It is not affected by device clear or * CLS Commands.

2.5. Command Syntax

The remote function is executed by sending a character string according to the following data format to the Oscilloscope as command or query.

Format	Example
(Header):(Command) (Parameter)	C1:TRA ON
(Command) (Parameter)	TRMD SINGLE
(Command)	*OPC

2.5.1. Command Program Header

The Command Program Header is used to specify the Channel, MATH and BUS numbers.

Header String (When the number is 1)	Description	Number Range
C1:	Specifying Channel number	1 to 8(DS-8108 / 8058 / 8038) 1 to 4(DS-8104 / 8054 / 8034)
M1:	Specifying MATH number	1 to 8
B1:	Specifying BUS number	1 to 2

The Command Program Header is optional. If omitted, the previous Command Program Header is used. In addition, the Command Program Header Number after the power of the oscilloscope is turned on is all 1.

2.5.2. Parameter Separation

In Remote Command where multiple Parameters exist, Parameters are separated by a comma (,).

2.5.3. Parameter syntax

<CHARACTER PROGRAM DATA> / <RESPONSE MESSAGE>

- <CHARACTER PROGRAM DATA> / <RESPONSE MESSAGE> is data composed of a combination of ASCII codes A to Z and 0 to 9, similar to the mnemonics used in the header part.

  In the case of C1:TRA ON,

  ON, which is a parameter of TRA Command, becomes <CHARACTER PROGRAM DATA>.

  The <CHARACTER RESPONSE DATA> responsed by the oscilloscope as a <RESPONSE MESSAGE > must be in uppercase.

<DECIMAL NUMERIC PROGRAM DATA> / <NUMERIC RESPONSE DATA>

- <DECIMAL NUMERIC PROGRAM DATA> / <NUMERIC RESPONSE DATA> is used for data that is treated as a numerical value in the format of integer (NR1), real number (NR2), or exponent (NR3). For example, if the message is "C1: VDIV 50MV", the "50MV" part is the <DECIMAL <NUMERIC

PROGRAM DATA>.

- <DECIMAL NUMERIC PROGRAM DATA> is interpreted as all uppercase letters.
- Math has no units whne it uses another Math as the source.
- The suffix multipliers and suffix units that can be used in <DECIMAL NUMERIC PROGRAM DATA> are as follows.

Symbol	Multiplier
EX	1E+18
PE	1E+15
T	1E+12
G	1E+9
MA[Note1]	1E+6
K	1E+3
M[Note1]	1E-3
U	1E-6
N	1E-9
P	1E-12
F	1E-15
A	1E-18

Units	Description
A	Current
HZ or MHZ[Note2]	Frequency
CEL	Temparature
OHM or MOHM[Note2]	Resistance
V	Voltage
W	Power

Note1: When you want to use 1E + 6 with <DECIMAL NUMERIC PROGRAM DATA>, use the suffix MA. Similarly, to use 1E -3V with <DECIMAL NUMERIC PROGRAM DATA>, use the suffix M.

Example 1: When setting VDIV 1E + 6V. It will be VDIV 1MAV

Example 2: When setting VDIV 1E -3V. It will be VDIV 1MV

Note2: MHZ and MOHM are exceptionally 1E + 6HZ and 1E + 6OHM.

The following numbers are all interpreted as the same value.

0.05 = 50E-3 = 5e-2V = 50mV

<STRING PROGRAM DATA> / <RESPONSE MESSAGE>

- <STRING PROGRAM DATA> / <RESPONSE MESSAGE> is STRING PROGRAM DATA enclosed in double caution (“). Supported character encoding is UTF-8.

  In the case of C1:CLAB “CH 1”,

  ”CH 1” is <STRING PROGRAM DATA>.

2.5.4. Compound Command

Compound Command is a function that can execute multiple Remote Commands with one transmission.

Compound command sends as follows.

C1:TRA ON;VDIV 50mV

Each Remote Command is split with a semicolon (;). Also, some commands do not support Compound Command.

3. Remote Commands

3.1. Common Commands

3.1.1. *CLS Command (Status clear)

*CLS Command clears (initializes) the entire Status Data Register.

■ Command

Command syntax

*CLS

Remarks

The register to clear is the following register.

- Status Byte Register
- Standard Event Status Register
- Trigger Event Status Register

3.1.2. *IDN? Query (Oscilloscope information)

*IDN? Query queries Oscilloscope information.

■ Query

Query syntax

*IDN?

RESPONSE MESSAGE

<maker_name>,<model>,<serial_number>,<firmware-level>

Parameter	Description	Response data
<maker_name>	Manufacture name	IWATSU
<model>	Model name	DS-8108/8104 DS-8058/8054 DS-8038/8034
<serial_number>	Serial number	11 digit serial number
<firmware_level>	Release level	A 1-digit number indicating the release level, a 2-digit minor release level with a period in between.

3.1.3. *RCL Command (Calling front panel setting data)

* RCL Command calls the setting data of the front panel from 5 built-in memory areas.

- Command

  Command syntax

  *RCL <panel_setup>

  <panel_setup>; Front panel setup number

Data Format	Setting
CHARACTER PROGRAM DATA	0, 1 to 5 0 : Default configuration 1 to 5 : Setting one of the five internal memory areas

3.1.4. *SAV Command (Saving front panel setting data)

* SAV Command sets the front panel setting data by naming it in 5 internal memories.

■ Command

Command syntax

*SAV <setup _setup>,<label>

<setup _setup> : Front panel setup number

Data Format	Setting
CHARACTER PROGRAM DATA	0, 1 to 5 0 : Do nothing 1 to 5 : Setting one of the five internal memory areas

<label> : Label name for front panel setup data

Data Format	Setting
CHARACTER PROGRAM DATA	Enclose the characters you want to set with double caution (“)

Remarks

- <label> can be up to 32 characters. Characters after 33 characters are not set.
- Only double coating (“) cannot be set. Command error (CME) will occur.

  Example) * SAV 1,“ ””

3.1.5. RUN Command (Set trigger to RUN)

RUN Command sets trigger to RUN.

- Command

Command syntax

RUN

Remarks

RUN Command sets trigger to RUN only. Trigger Mode does not change.

3.1.6. *STB? Query (Status Register (STB)、Master Summary Status (MSS))

*STB? Query queries Status Register byte and Master Summary Status bit (MSS message).

■ Query

Query syntax

*STB?

RESPONSE MESSAGE

<status>

<status> : STB register set value

Parameter	Data Format
<status>	NR1 NUMERIC RESPONSE DATA

Remarks

For the contents of each bit, refer to "2.4.1 Status Byte Register".

3.1.7. STOP Command (Stop capturing)

STOP Command sets the trigger to STOP.

- Command

Command syntax

STOP

Remarks

The operation is the same as TRMD STOP.

3.1.8. WSGL Command / Query (Setting Trigger Mode (SINGLE))

WSGL Command sets the trigger to SINGLE.

WSGL? Query queries the trigger to SINGLE. However, wait for the SINGLE measurement to complete.

- Command

Command syntax

WSGL

- Query

Query syntax

WSGL?

RESPONSE MESSAGE

+0000001

Remarks

WSGL? Query is used to synchronize the application program with the completion of waveform data acquisition.

3.1.9. *ESE Command / Query (Event Status Register (ESE) setting / reading)

*ESE Command sets Standard Event Status Enable Register (ESE).

*ESE? Query queries the contents of the ESE Register.

■ Command

Command syntax

*ESE <value>

<value> : The value of Standard Event Status Enable Register

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0 to 255

Remarks

- The command allows the user to connect multiple ESR register events to the STB register's ESB summary message bit (bit 5).
- When the entered <value> value is greater than 255 or less than 0, an execution error (EXE) will occur.

■ Query

Query syntax

*ESE?

RESPONSE MESSAGE

<value>

3.1.10. *ESR? Query (Event Status Register (ESR) reading and clear)

*ESR? Query queries and clears Event Status Register (ESR).

Binary code with Register bits 0-7 is added and the sum is returned as a response to the query.

■ Query

Query syntax

*ESR?

RESPONSE MESSAGE

<status>

<status> : The value of Event Status Register

Parameter	Data Format
<status>	NR1 NUMERIC RESPONSE DATA

Remarks

<status> is the value weighted by the power of 2 for each bit of the Standard Event Status Register.

Below is a description of the numbers.

7	128 PON	: Power on.
6	64 URQ	: Not used in the oscilloscope.
5	32 CME	: Command error.
4	16 EXE	: Execution error.
3	8 DDE	: Device error.
2	4 QYE	: Query error.
1	2 RQC	: Not used in the oscilloscope.
0	1 OPC	: Operation completed.

3.1.11. *OPC Command / Query (Done)

* OPC (Done) Command sets the OPC bit (bit 0) of the Standard Event Status Register (ESR) to "1" when all previous operations are completed.

*OPC? Query queries the response "1" after the execution of all previous commands is completed.

■ Command

Command syntax

*OPC

■ Query

Query syntax

*OPC?

RESPONSE MESSAGE

1

Remarks

For *OPC? Query, the OPC bit (bit 0) of the ESR Register is unaffected by other behaviors.

*OPC? Specific Command

The following Command cannot receive done response in Query. You can use * OPC? Query after these Commands to see When the Command has been executed. However, it does not confirm whether the Command completed normally.

Command	Description
*CLS	Register clear (initialization) completed
*RCL	Front panel setting data recall completed
*SAV	Completion of saving front panel setting data
STOP	Trigger stopped completed
*TRG	Trigger SINGLE setting
MFSC	MATH Vertical axis scale automatic adjustment completed
TFL	Trigger Level automatic adjustment completed
CLSWP	Waveform clear completed
COPY	Screen data saving completed
FWASCI	Completion of saving ASCII waveform data
FWBIN	Binary waveform data saved completed

MKDIR	Directory creation completed
RMVF	File and directory deletion completed
SFSTP	Setup file saved completed
RFSTP	Setup file recall completed
ASET	Auto setup completed
ZMRST	Vertical axis ZOOM reset completed
ZMHRST	Horizontal axis ZOOM reset completed

3.1.12. *RST Command (Reset, Recall Default Setup)

*RST Command sets device reset. *RST Command also recalls the default setup.

- Command

  Command syntax

  *RST

3.1.13. *SRE Command / Query (Service Request Enable (SRE) Register)

*SRE Command sets the Service Request Enable (SRE) Register.

* SRE? Query queries a value that represents the bit setting of the SRE Register when the value is converted to binary code.

■ Command

Command syntax

*SRE <value>

<value>: The value of Service Request Enable Register

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0 to 255

Remarks

The command allows you to specify which summary bit in the STB register to use when creating a service request (SRQ). When a "1" is written to the corresponding bit location, the summary message bit is valid. When a "0" is written to the corresponding bit location, the corresponding event will not make a service request. SRQ interrupts are turned off when the SRE register is cleared.

■ Query

Query syntax

*SRE?

RESPONSE MESSAGE

<value>

3.1.14. TESE Command / Query (Trigger Event Status Enable Register)

TESE Command sets Trigger Event Status Enable Register.

TESE? Query queries the current settings of the Trigger Event Status Enable Register.

- Command

Command syntax

TESE <value>

<value>: Trigger Event Status Enable Register value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0 to 255

Remarks

Use the command to determine whether to connect the Trigger Event Status Register summary message with the status byte.

- Query

Query syntax

TESE?

RESPONSE MESSAGE

<value>

3.1.15. TESR? Query (Read Trigger Event Status Register)

TESR? Query queries Trigger Event Status Register.

■ Query

Query syntax

TESR?

RESPONSE MESSAGE

<value>

Remarks

It is weighted to a power of 2.

Please refer to "2.4.3 Trigger Event Status Register" for the contents.

3.1.16. *TRG Command (Set Trigger Mode (SINGLE))

* TRG Command sets Trigger Mode to SINGLE and puts it in the RUN state.

- Command

  Command syntax

  *TRG

3.1.17. MTRG Command (manual trigger execution)

MTRG Command executes a manual trigger.

■ Command

Command syntax

MTRG

Remarks

- When the MTRG Command is executed while the trigger is Auto or Normal and waiting for the trigger, the waveform is acquired and the next waveform acquisition begins.
- When the MTRG Command is executed while the trigger is Single and waiting for the trigger, the waveform is acquired and the unit moves to the STOP state.

3.1.18. *WAI Command (Wait)

* WAI (Wait) Command waits for all command executions prior to the command to complete.

■ Command

Command syntax

*WAI

Remarks

Use WSGL? to wait for the waveform acquisition to be completed with the trigger "SINGLE".

3.2. WAVEFORM DISPLAY GROUP

3.2.1. VECT Command / Query (Data interpolation)

VECT Command sets data interpolation ON / OFF.

VECT? Query queries data interpolation ON / OFF.

■ Command

Command syntax

VECT <function>

<function> : data interpolation ON / OFF.

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF ON : Set to vector OFF : Set to dot

■ Query

Query syntax

VECT?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.2.2. INTS Command / Query (Waveform brightness)

INTS Command sets the brightness of the screen waveform.

INTS? Query queries the brightness of the screen waveform.

- Command

Command syntax

INTS <intensity>

<intensity> : Waveform brightness

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0 to 100

- Query

Query syntax

INTS?

RESPONSE MESSAGE

<intensity>

Parameter	Data Format
<intensity>	NR1 NUMERIC RESPONSE DATA

3.2.3. PERF Command / Query (Persistence function)

PERFCommand sets the persistence feature ON / OFF.

PERF? Query queries the persistence feature ON / OFF.

- Command

Command syntax

PERF <persistence>

<persistence>: Persistence function status

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

PERF?

RESPONSE MESSAGE

<persistence >

Parameter	Data Format
<persistence >	CHARACTER RESPONSE DATA

3.2.4. PERS Command / Query (Persistence time)

PERS Command sets the persistence time of the waveform.

PERS? Query queries the persistence time of the waveform.

■ Command

Command syntax

PERS <time>

<time> : Persistence time

Data Format	Setting
CHARACTER PROGRAM DATA	100MS, 200MS, 500MS, 1S, 2S, 5S, 10S, INFINITE

Remarks

- When you set anything other than the above setting, a Command error (CME) will occur.
- INFINITE has an infinite persistence time.

■ Query

Query syntax

PERS?

RESPONSE MESSAGE

<time>

Parameter	Data Format
<time>	CHARACTER RESPONSE DATA

3.2.5. WAVDISP Command / Query (Display mode)

WAVDISP Command sets how to display the waveform.

WAVDISP? Query queries how to display the waveform.

■ Command

Command syntax

WAVDISP <type>

<type>: Waveform display method

Data Format	Setting
CHARACTER PROGRAM DATA	SINGLE, SPLIT, XY, XY_SINGLE, XY_SPLIT, OFF ・ SINGLE: Displays all waveforms on one screen. ・ SPLIT: Display for each waveform. ・ XY: XY display. ・ XY_SINGLE: The XY display and the SINGLE display are displayed side by side. ・ XY_SPLIT: The XY display and the SPLIT display are displayed side by side. ・ OFF: Hides the waveform.

Remarks

・In case the MODE command is ROLL, executing the WAVDISP commands XY, XY_SINGLE, XY_SPLIT causus a device specific error.

■ Query

Query syntax

WAVDISP?

RESPONSE MESSAGE

<type>

Parameter	Data Format
<type>	CHARACTER RESPONSE DATA

3.2.6. GRAT Command / Query (Scale type)

GRAT Command sets the scale type.

GRAT? Query queries the scale type.

■ Command

Command syntax

GRAT <type>

<type> : Scale type

Data Format	Setting
CHARACTER PROGRAM DATA	GRID, AXIS, FRAME GRID : Grid scale type AXIS : Axis scale type FRAME : Frame scale type

■ Query

Query syntax

GRAT?

RESPONSE MESSAGE

<type>

Parameter	Data Format
<type>	CHARACTER RESPONSE DATA

3.2.7. GINT Command / Query (Grid line brightness)

GINT Command sets the brightness of the grid lines on the screen.

GINT? Query queries the current brightness of the grid lines on the screen.

■ Command

Command syntax

GINT <intensity>

<intensity>: Grid line brightness

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0 to 100

■ Query

Query syntax

GINT?

RESPONSE MESSAGE

<intensity>

Parameter	Data Format
<intensity>	NR1 NUMERIC RESPONSE DATA

3.2.8. XYCH Command / Query (The source of XY display)

The XYCH command sets the source to be displayed in XY.

The XYCH? Query queries the source of the current XY display.

- Command

  Command syntax

  XYCH <source1>,<source2>

  <source1>: the source 1 of XY display

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

  <source2> : the source 2 of XY display

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

- Query

  Query syntax

  XYCH?

  RESPONSE MESSAGE

  <source1>,<source2>

Parameter	Data Format
<source1>	RESPONSE MESSAGE
<source2>	RESPONSE MESSAGE

3.2.9. HLAB Command / Query (Horizontal axis label display settings)

The HLAB command Command displays or sets the horizontal axis label.

The HLAB? Query gets the display settings for the current horizontal axis label.

- Command

  Command syntax

  HLAB <display>

  <display> : Horizontal axis label display

Data Format	Setting
CHARACTER PROGRAM DATA	SHOW, HIDE, AUTO_HIDE

- Query

  Query syntax

  HLAB?

  RESPONSE MESSAGE

  <display>

Parameter	Data Format
<display>	CHARACTER RESPONSE DATA

3.2.10. VLAB Command / Query(Vertical axis label display settings)

VLAB command sets whether to display vertical axis labels.

The VLAB? Query gets the display settings for the current vertical axis label.

- Command

  Command syntax

  VLAB <display>

  <display> : Display of vertical axis labels

Data Format	Setting
CHARACTER PROGRAM DATA	SHOW, HIDE, AUTO_HIDE

- Query

  Query syntax

  VLAB?

  RESPONSE MESSAGE

  <display>

Parameter	Data Format
<display>	CHARACTER RESPONSE DATA

3.3. CHANNEL GROUP

3.3.1. TRA Command / Query (Trace display)

TRA Command sets the trace display ON / OFF for the specified input channel or Math.

TRA? Query queries the display status of the specified trace.

■ Command

Command syntax

<Channel> or<Math>:TRA <function>

<Channel> : Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<Math> : Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<function> : Waveform drawing ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

■ Query

Query syntax

<Channel>: TRA?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.3.2. CLAB Command / Query (Channel label)

CLAB Command sets a label for each channel.

CLAB? Query queries the label for each current channel.

■ Command

Command syntax

<Channel>:CLAB <label>

<Channel> : Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<label> : Input channel label name

Data Format	Setting
CHARACTER PROGRAM DATA	Enclose the characters you want to set with double caution (“).

Remarks

- <label> is up to 32 characters. Characters after 33 characters are not set.
- Only double coating (“) cannot be set. A Command error (CME) will occur.

  Example) CLAB “””

Example of use

Set label name Channel to CH1

C1:CLAB “Channel”

■ Query

Query syntax

<Channel>:CLAB?

RESPONSE MESSAGE

<label>

Parameter	Data Format
<label>	CHARACTER RESPONSE DATA

3.3.3. CLBSW Command / Query (Displaying channel labels)

CLBSW Command sets whether to display the label of the specified channel.

CLBSW? Query queries the label display status of the specified channel.

■ Command

Command syntax

<Channel>:CLBSW <function>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<function>: Channel labeling ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Remarks

When the specified channel is not TRA ON, the label will not be displayed.

■ Query

Query syntax

<Channel>:CLBSW?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.3.4. VDIV Command / Query (Vertical axis range)

The VDIV command sets the vertical axis range of the specified input channel or Math.

VDIV? Query queries the vertical range of the specified channel or Math.

■ Command

Command syntax

<Channel>or<Math>:VDIV <v_gain>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<v_gain>: Vertical axis range of the channel

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	1mV to 10V

How to round the value with <v_gain> (When the Probe attenuation ratio 1:1)

Rounding range	Setting vertical axis range
v_gain <= 1E-3	1.00mv/div
1E-3 <v_gain <= 2E-3	2.00mv/div
: :	
5 <v_gain	10.0V/div

When the Probe attenuation ratio is other than 1: 1, each of the above ranges will be multiplied by the value of the Probe attenuation ratio.

Remarks

· When the Probe attenuation ratio is set to "AUTO", the above range will be multiplied by the detected Probe attenuation ratio.

- When using rescale, the above range is multiplied by a in the rescale formula ax + b.
- Depending on the value, it may be rounded to a larger value that is acceptable.
- When VFINE Command is ON, <v_gain> can be set with a finer value.

■ Query

Query syntax

<Channel>or<Math>:VDIV?

RESPONSE MESSAGE

<v_gain>

Parameter	Data Format
<v_gain>	NR3 NUMERIC RESPONSE DATA

3.3.5. VFINE Command / Query (Switching the Fine of the vertical axis range)

VFINE Command sets Fine ON / OFF for the vertical range of the specified input channel.

VFINE? Query queries Fine ON / OFF for the vertical range of the current specified input channel.

- Command

Command syntax

<Channel>:VFINE <function>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<function> : Channel Vertical axis Range Fine ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Remarks

Fine can only be set for channels. Math does not have a Fine in the vertical range.

- Query

Query syntax

<Channel>:VFINE?

RESPONSE MESSAGE

<function>

Parameter	Data Data Format
<function>	CHARACTER RESPONSE DATA

3.3.6. OFST Command / Query (Offset setting)

OFST Command sets the Offset of the specified input channel or Math.

OFST? Query queries the Offset of the specified input channel or Math.

■ Command

Command syntax

<Channel> or<Math>:OFST <offset>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<Math> : Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<offset>: Input Channel Offset

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	See table below

Range of <offset> for Probe attenuation ratio (1: 1) and Rescale off

Impeadance	Offset
Impeadance 50 Ω	1 mV/div to 20 mV/div:±1 V 50mV/div:±5V 100 mV/div to 200 mV/div: ±10 V 500 mV/div to 1 V/div:±50 V
Impeadance 1 MΩ	1 mV/div to 50 mV/div:±1 V 100 mV/div to 500 mV/div:±10 V 1 V/div to 10 V/div:±200 V

Remarks

- Values outside the above range are rounded to the maximum or minimum allowed, whichever is closer. Also, some values may be rounded to a smaller acceptable value.
- Only the value of the Probe attenuation ratio is multiplied by the above range.

- Whe the Probe attenuation ratio is set to "AUTO", the above range will be multiplied by the value according to the detected probe ratio.
- When you are using rescale, the above range is multiplied by a in the rescale formula ax + b and subtracted by b.

■ Query

Query syntax

<Channel>: OFST?

RESPONSE MESSAGE

<offset>

Parameter	Data Format
<offset>	NR3 NUMERIC RESPONSE DATA

3.3.7. CPL Command / Query (Channel Coupling)

CPL Command sets the Coupling mode for the specified input channel.

CPL? Query queries the selected Coupling mode.

■ Command

Command syntax

<Channel>:CPL <coupling >

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<function> : Input Coupling

Data Format	Setting
CHARACTER PROGRAM DATA	AC 1 M, GND, DC 1 M, DC 50 AC 1 M : Set to Coupling AC1 MΩ GND : Set to Coupling GND DC 1 M : Set to Coupling DC1 MΩ. DC 50 : Set to Coupling DC50 Ω.

■ Query

Query syntax

<Channel>:CPL?

RESPONSE MESSAGE

<coupling>

Parameter	Data Format
<coupling>	CHARACTER RESPONSE DATA

3.3.8. BWL Command / Query (Bandwidth limit (lowpass filter) ON / OFF)

BWL Command sets the bandwidth of the Bandwidth limit (lowpass filter) of the specified input channel.

BWL? Query queries the Bandwidth limit of the current Channel.

■ Command

Command syntax

<Channel>:BWL <mode>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<mode>: Input Channel Bandwidth Limit (Low Pass Filter)

Data Format	Setting
CHARACTER PROGRAM DATA	FULL, 20 M, 100 M, 500 M (DS-8108/8104) FULL, 20 M, 100 M (DS-8058/8054/8038/8034)

Remarks

- Setting the BWL 500 M on the low bandwidth model (DS-8058/8054/8038/8034) results in a device-specific error (DDE).
- When you set anything other than setting, a command error (CME) will occur.

■ Query

Query syntax

<Channel>:BWL?

RESPONSE MESSAGE

<mode>

Parameter	Data Format
<mode>	CHARACTER RESPONSE DATA

3.3.9. PROBE Command / Query (Probe attenuation ratio)

PROBE Command sets the Probe attenuation ratio for the specified input channel.

PROBE? Query queries the Probe attenuation ratio for the specified input channel.

■ Command

Command syntax

<Channel>:PROBE <probe_mode>,<probe>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<probe_mode>: Probe mode

Data Format	Setting
CHARACTER PROGRAM DATA	AUTO, MANUAL

<probe>: Probe ratio

Data Format	Setting
CHARACTER PROGRAM DATA	0.1, 1, 2, 5, 20, 20, 100, 200, 250, 500, 1000, 2000, 5000, 10000

Remarks

- When <probe_mode> is set to AUTO, the value of <probe> is ignored and the Probe attenuation ratio is determined automatically.
- When you set anything other than <probe> Setting, a Command error (CME) will occur.

■ Query

Query syntax

<Channel>: PROBE?

RESPONSE MESSAGE

<probe_mode>,<probe>

Parameter	Data Format
<probe_mode>	CHARACTER RESPONSE DATA
<probe>	CHARACTER RESPONSE DATA

Remarks

When <probe_mode> is AUTO, then <probe> is the automatically detected Probe attenuation ratio.

3.3.10. INV Command / Query (Waveform inversion ON / OFF)

INV Command sets Waveform inversion ON / OFF.

INV? Query queries the status (ON / OFF) of Waveform inversion

■ Command

Command syntax

<Channel>: INV <function>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<function>: Waveform inversion ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

■ Query

Query syntax

<Channel>:INV?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.3.11. DSKW Command / Query (Dskew settings)

DSKW Command sets the Deskew for the specified input channel.

DSKW? Query queries the Deskew for the specified input channel.

- Command

Command syntax

<Channel>:DSKW <deskew>

<Channel> : Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<deskew>: Skew

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-50.0 s[Note] to 50.0 s[Note]

Note: The upper limit of <deskew> depends on the value of TDIV. See the Instruction Manual for details.

- Query

Query syntax

<Channel>:DSKW?

RESPONSE MESSAGE

<deskew>

Parameter	Data Format
<deskew>	NR3 NUMERIC RESPONSE DATA

3.3.12. RSCL Command / Query (Rescale ON / OFF)

RSCL Command sets Rescale ON / OFF.

RSCL? Query queries Rescale ON / OFF.

- Command

Command syntax

<Channel>:RSCL <function>

<Channel> : Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<function> : Rescale ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

<Channel>:RSCL?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.3.13. RSCA Command / Query (Rescale a)

RSCA Command sets a in the Rescale formula a x + b.

RSCA? Query queries the a in Rescale.

■ Command

Command syntax

<Channel>: RSCA<rsc_a>,<rsc_idx>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<rsc_a>: Significant of rescale a

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0.01 to 1.00

<rsc_idx>: Rescale a exponent

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6 to +3

■ Query

Query syntax

<Channel>: RSCA?

RESPONSE MESSAGE

<rsc_a>,<rsc_idx>

Parameter	Data Format
<rsc_a>	NR3 NUMERIC RESPONSE DATA
<rsc_idx>	NR1 NUMERIC RESPONSE DATA

3.3.14. RSCB Command / Query (Rescale b)

RSCB Command sets b in Rescale's formula a x + b.

RSCB? Query queries the b in Rescale.

- Command

Command syntax

<Channel>: RSCA <rsc_b>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<rsc_b>: Rescale b

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-10 div to +10 div

- Query

Query syntax

<Channel>:RSCB?

RESPONSE MESSAGE

<rsc_b>

Parameter	Data Format
<rsc_b>	NR3 NUMERIC RESPONSE DATA

3.3.15. VUNI Command / Query (Vertical axis unit)

VUNI Command sets the unit of the vertical axis for the specified input channel.

VUNI? Query queries the units of the specified vertical axis.

■ Command

Command syntax

<Channel>: VUNI <unit>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<unit> : Channel Vertical axis unit

Format	Setting
CHARACTER PROGRAM DATA	V, A, W, CEL, OHM, NOUNIT

Remarks

The unit of setting of <unit> is shown in the table below.

<unit>	Description
V	Voltage
A	Current
W	Power
CEL	Celsius degree
OHM	Resistance
NOUNIT	No unit

■ Query

Query syntax

<Channel>: VDIV?

RESPONSE MESSAGE

<unit>

Parameter	Data Format
<unit>	CHARACTER RESPONSE DATA

3.3.16. FCUT Command / Query (Digital filter cutoff frequency)

The FCUT command sets the cutoff frequency of the digital filter for the specified input channel.

The FCUT? Query gets the cutoff frequency of the digital filter for the specified input channel.

If the digital filter type is set to low-pass filter (LPF) or high-pass filter (HPF), the cutoff frequency is enabled.

■ Command

Command syntax

<Channel>:FCUT <cutoff>

<Channel> : Channel header

Data Format	Setting
Command program header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108/8058/8038) {C1, C2, C3, C4} (DS-8104/8054/8034)

<cutoff> : Cutoff frequency

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	(Sampling rate) x 0.04 ~ (Sampling rate) x 0.46

■ Query

Query syntax

<Channel>:FCUT?

RESPONSE MESSAGE

<cutoff>

Parameter	Data Format
<cutoff>	NR3 NUMERIC RESPONSE DATA

3.3.17. FTYP Command / Query (Digital filter type)

FTYP command sets the type of digital filter for the specified input channel.

The FTYP? Query gets the type of digital filter for the specified input channel.

■ Command

Command syntax

<Channel>:FTYP <type>

<Channel> : Channel header

Data Format	Setting
Command program header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108/8058/8038) {C1, C2, C3, C4} (DS-8104/8054/8034)

<type> : Digital filter type

Data Format	Setting
CHARACTER PROGRAM DATA	OFF, LPF, HPF, SMA

■ Query

Query syntax

<Channel>:FTYP?

RESPONSE MESSAGE

<type>

Parameter	Data Format
<type>	CHARACTER RESPONSE DATA

3.3.18. FWID Command / Query (Processing width of digital filter)

The FWID command sets the processing width of the digital filter for the specified input channel.

The FWID? Query gets the processing width of the digital filter for the specified input channel.

If you set the digital filter type to Simple Moving Average Filter (SMA), the processing width is enabled.

■ Command

Command syntax

<Channel>:FWID <width>

<Channel> : Channel header

Data Format	Setting
Command program header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108/8058/8038) {C1, C2, C3, C4} (DS-8104/8054/8034)

<width> : Processing width of digital filter

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	1～25

■ Query

Query syntax

<Channel>:FWID?

RESPONSE MESSAGE

<width>

Parameter	Data Format
<width>	NR1 NUMERIC RESPONSE DATA

3.4. BUS GROUP

3.4.1. BTRA Command / Query (BUS trace display)

BTRA Command sets BUS trace display ON / OFF.

BTRA? Query queries the current BUS trace display ON / OFF.

- Command

Command syntax

<Bus>: BTRA <function>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<function>: BUS trace ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

<Bus>:BTRA?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.4.2. BLAB Command / Query (BUS label)

BLAB Command sets BUS label.

BLAB? Query queries the current BUS label.

■ Command

Command syntax

<Bus>: BLAB <label>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<label>: Input Channel label name

Data Format	Setting
CHARACTER PROGRAM DATA	Enclose the characters you want to set with double caution (“).

Remarks

- <label> can be up to 32 characters. Characters after 33 characters are not set.
- Double quotation (“) only cannot be set. Command error (CME) will occur.

  Example) BLAB “” ”

Example of use

Set the label name BUS for Bus1

B1:BLAB “BUS”

■ Query

Query syntax

<Bus>:BLAB?

RESPONSE MESSAGE

<label>

Parameter	Data Format
<label>	CHARACTER RESPONSE DATA

3.4.3. BLBSW Command / Query (Display of BUS label)

BLBSW Command displays or sets the BUS label.

BLBSW? Query queries the label status of the current BUS.

- Command

Command syntax

<Bus>:BLBSW <function>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<function>: BUS trace status

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Remarks

When the specified Bus is not BTRA ON, the label will not be displayed.

- Query

Query syntax

<Bus>:BLBSW?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.4.4. BTYP Command / Query (BUS Trigger Type)

BTYP Command sets BUS Trigger Type.

BTYP? Query queries the current BUS Trigger Type.

- Command

Command syntax

<Bus>:BTYP <type>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<type>: BUS serial Trigger Type

Data Format	Setting
CHARACTER PROGRAM DATA	UART, SPI, I2C

- Query

Query syntax

<Bus>:BTYP?

RESPONSE MESSAGE

<type>

Parameter	Data Format
<type>	CHARACTER RESPONSE DATA

3.4.5. BUART Command / Query (BUS-UART sets)

BUART Command sets BUS-UART.

BUART? Query queries the current BUS-UART settings.

- Command

Command syntax

<Bus>:BUART <source>,<threshold>,<rate>,<stop>,<parity>,<idle>,<order>,<numbit>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<source>: UART source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

<threshold>: UART threshold

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6div to +6div

<rate>: Trigger rate

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	1.000KBPS, 1.200KBPS, 1.800KBPS,2.000KBPS,2.400KBPS, 3.600KBPS, 4.800KBPS, 7.200KBPS, 9.600KBPS, 14.40KBPS, 15.20KBPS, 19.20KBPS, 28.80KBPS, 38.40KBPS, 56.00KBPS, 57.60KBPS, 62.50KBPS, 76.80KBPS, 115.2KBPS, 128.0KBPS, 230.4KBPS, 460.8KBPS, 921.6KBPS, 1.000MABPS

<stop>: Stop bit size

Data Format	Setting
CHARACTER PROGRAM DATA	1BIT, 2BIT

<parity>: Parity bit

Data Format	Setting
CHARACTER PROGRAM DATA	NONE, EVEN, ODD NONE: Set the parity bit to none. EVEN: Set the parity bit to an even number. OOD: Set the parity bit to an odd number.

<idle>: Polarity at idle

Data Format	Setting
CHARACTER PROGRAM DATA	HIGH, LOW

<order>: Bit order

Data Format	Setting
CHARACTER PROGRAM DATA	MSB, LSB

<numbit>: Bit number

Data Format	Setting
CHARACTER PROGRAM DATA	5BIT, 6BIT, 7BIT, 8BIT

Remarks

- The value entered in <rate> is rounded to the nearest Setting.
- When BURFINE Command is ON, <rate> can be set to a finer value.

■ Query

Query syntax

<Bus>:BUART?

RESPONSE MESSAGE

<source>,<threshold>,<rate>,<stop>,<parity>,<idle>,<order>,<numbit>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<threshold>	NR3 NUMERIC RESPONSE DATA
<rate>	NR3 NUMERIC RESPONSE DATA
<stop>	CHARACTER RESPONSE DATA
<parity>	CHARACTER RESPONSE DATA
<idle>	CHARACTER RESPONSE DATA
<order>	CHARACTER RESPONSE DATA
<numbit>	CHARACTER RESPONSE DATA

3.4.6. BURFINE Command / Query (BUS-UART bit rate Fine switching)

BURFINE Command sets Fine ON / OFF for the BUS-UART bit rate.

BURFINE? Query queries the Fine ON / OFF of the current BUS-UART bit rate.

- Command

Command syntax

<Bus>:BURFINE <function>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<function>: BUS-UART Bit Rate Fine ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

<Bus>:BURFINE?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.4.7. BSCL Command / Query (BUS-SPI clock settings)

BSCL Command sets BUS-SPI.

BSCL? Query queries the current BUS-SPI settings.

■ Command

Command syntax

<Bus>:BSCL <clock_source>,<clock_edge>,<clock_threshold>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<clock_source>: BUS-SPI Clock Source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

<clock_edge>: BUS-SPI Clock edge

Data Format	Setting
CHARACTER PROGRAM DATA	POS, NEG

<clock_threshold>: BUS-SPI clock threshold

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6 div to +6 div

■ Query

Query syntax

<Bus>:BSCL?

RESPONSE MESSAGE

<clock_source>,<clock_edge>,<clock_threshold>

Parameter	Data Format
<clock_source>	CHARACTER RESPONSE DATA
<clock_edge>	CHARACTER RESPONSE DATA
<clock_threshold>	NR3 NUMERIC RESPONSE DATA

3.4.8. BSDA Command / Query (BUS-SPI sets)

BSDA Command sets BUS-SPI.

BSDA? Query queries the current BUS-SPI settings.

- Command

Command syntax

<Bus>:BSDA <mosi_source>,<mosi_threshold>,<miso_source>,<miso_threshold>,

<order>,<wordsize>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<mosi_source>: MOSI Source Channel

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

<mosi_threshold>: MOSI threshold

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6 div to +6 div

<miso_source>: MISO Source channel

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

<miso_threshold>: MISO threshold

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6 div to +6 div

<order>: Bit order at the time of decoding

Format	Setting
CHARACTER PROGRAM DATA	LSB, MSB

<wordsize>: Word size at the time of decoding

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	4 to 16

■ Query

Query syntax

<Bus>:BSDA?

RESPONSE MESSAGE

<mosi_source>,<mosi_threshold>,<miso_source>,<miso_threshold>,

<order>,<wordsize>

Parameter	Data Format
<mosi_source>	CHARACTER RESPONSE DATA
<mosi_threshold>	NR3 NUMERIC RESPONSE DATA
<miso_source>	CHARACTER RESPONSE DATA
<miso_threshold	NR3 NUMERIC RESPONSE DATA
<order>	CHARACTER RESPONSE DATA
<wordsize>	NR1 NUMERIC RESPONSE DATA

3.4.9. BSCH Command / Query (BUS-SPI chip select settings)

BSCH Command sets BUS-SPI chip select.

BSCH? Query queries the current BUS-SPI chip select setting.

- Command

Command syntax

<Bus>:BSCH <chip_source>,<chip_threshold>,<chip_type>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<chip_source>: BUS-SPI Source channel

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

<chip_threshold>: BUS-SPI Chip select threshold

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6 div to +6 div

<chip_type>; BUS-SPI Chip select Type

Data Format	Setting
CHARACTER PROGRAM DATA	HIGH, LOW, TOUT HIGH: Set the BUS-SPI chip select Type to HIGH. LOW: Set the BUS-SPI chip select Type to LOW. TOUT : Set the BUS-SPI chip select Type to Timeout.

■ Query

Query syntax

<Bus>:BSCH?

RESPONSE MESSAGE

<chip_source>,<chip_threshold>,<chip_type>

Parameter	Data Format
<chip_source>	CHARACTER RESPONSE DATA
<chip_threshold>	NR3 NUMERIC RESPONSE DATA
<chip_type>	CHARACTER RESPONSE DATA

3.4.10. BTSPI Command / Query (BUS-SPI Chip select timeout setting)

BTSPI Command sets BUS-SPI chip select timeout

BTSPI? Query queries the current BUS-SPI chip select timeout

- Command

Command syntax

<Bus>:BTSPI <timeout>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<timeout>: BUS-SPI Chip select timeout

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	100ns to 10s

- Query

Query syntax

<Bus>:BTSPI?

RESPONSE MESSAGE

<timeout>

Parameter	Data Format
<timeout>	NR3 NUMERIC RESPONSE DATA

3.4.11. BI2C Command / Query (BUS-I2C setting)

BI2C Command sets BUS-I2C.

BI2C? Query queries the current BUS-I2C setting.

- Command

Command syntax

<Bus>:BI2C <scl_source>,<scl_threshold>,<sda_source>,<sda_threshold>,<address_size>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<scl_source>: BUS-I2C SCL Source channel

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

<scl_threshold>: BUS-I2C SCL threshold

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6 div to +6 div

<sda_source>: BUS-I2C SDA Source channel

Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

<sda_threshold>: BUS-I2C SDA threshold

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6 div to +6 div

<address_size>: Number of address bits at the time of decoding

Data Format	Setting
CHARACTER PROGRAM DATA	7 BIT, 10 BIT

- Query

  Query syntax

  <Bus>:BI2C?

  RESPONSE MESSAGE

  <scl_source>,<scl_threshold>,<sda_source>,<sda_threshold>,<address_size>

Parameter	Data Format
<scl_source>	CHARACTER RESPONSE DATA
<scl_threshold>	NR3 NUMERIC RESPONSE DATA
<sda_source>	CHARACTER RESPONSE DATA
<sda_threshold>	NR3 NUMERIC RESPONSE DATA
<address_size>	CHARACTER RESPONSE DATA

3.4.12. SRLDCD Command / Query (Serial decode display)

SRLDCD Command sets Serial decode display.

SRLDCD? Query queries the current Serial decode display status.

- Command

Command syntax

<Bus>:SRLDCD <function>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<function>: BUS Serial decode status

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

<Bus>:SRLDCD?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.4.13. BLIST Command / Query (BUS Decode list)

BLIST Command sets whether to display the BUS decode list.

BLIST? Query queries the status of the current BUS decode list.

- Command

Command syntax

<Bus>:BLIST <function>

<Bus>: BUS header

Format	Setting
Command Program Header	B1, B2

<function>: BUS Decode list status

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

<Bus>:BLIST?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.5. MATH. GROUP

3.5.1. MLAB Command / Query (Math label)

MLAB Command sets the label for the specified Math.

MLAB? Query queries the label of the specified Math.

■ Command

Command syntax

<Math>:MLAB <label>

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<label>: Math label name

Data Format	Setting
CHARACTER PROGRAM DATA	Enclose the characters you want to set with double caution (“).

Remarks

- <label> is a 32-word character. Characters after 33 characters are not set.
- Only double coating (“) cannot be set. A Command error (CME) will occur.Exsample)MLAB “””

Example of use

Set label name to MATH in Math1

M1:MLAB “MATH”

■ Query

Query syntax

<Math>:MLAB?

RESPONSE MESSAGE

<label>

Parameter	Data Format
<label>	CHARACTER RESPONSE DATA

3.5.2. MLBSW Command / Query (Display of Math label)

MLBSW Command sets whether to display the label of the specified Math.

MLBSW? Query queries the label display status of the specified Math.

- Command

Command syntax

<Math>:MLBSW <function>

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<function>: Math label display ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Remarks

When the specified Mathe not TRA ON, the label will not be displayed.

- Query

Query syntax

<Math>:MLBSW?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.5.3. MATH Command / Query (MATH operation Type)

MATH Command sets the specified Math Type.

MATH? Query queries the specified Math Type.

- Command

Command syntax

<Math>:MATH <type>

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<type>: Math Type

Data Format	Setting
CHARACTER PROGRAM DATA	BASIC, ABS, INV, INTGR, DERIV, FFT BASIC: MATH Type Basic ABS: MATH Type Absolute INV: MATH Type Invert INTGR: MATH Type Integral DERIV: MATH Type Derivative FFT: MATH Type FFT SMA: MATH Type SMA

- Query

Query syntax

<Math>:MATH?

RESPONSE MESSAGE

<type>

Parameter	Data Format
<type>	CHARACTER RESPONSE DATA

3.5.4. MATHS Command / Query (Source channel)

MATHS Command sets the Source channel for the specified Math.

MATHS? Query queries the Source channel of the specified Math.

- Command

Command syntax

<Math>:MATHS <source1>,<source2>

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<source1>: MATH source channel 1

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<source2>: MATH source channel 2

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

Remarks

- The FFT Source channel cannot be set. Use FSRC for setting.
- <source1> is applied to the Source channel of the operation type other than BASIC operation.
- The conditions for selectiong MATH as the source are as follows.

Condition	Selectable
Math source is only channel source.	Yes
Math source contains Math source.	No
Math type is FFT	No
Same Math as Math to select source[Note]	No

Note: (Example) Math1 cannot be selected as the source for Math1.

■ Query

Query syntax

<Math>:MATHS?

RESPONSE MESSAGE

<source1>,<source2>

Parameter	Data Format
<source1>	CHARACTER RESPONSE DATA
<source2>	CHARACTER RESPONSE DATA

3.5.5. BCMATH Command / Query (BASIC operation)

BCMATH Command sets the Specified Math BASIC operation.

BCMATH? Query queries the Specified Math BASIC operation.

- Command

Command syntax

<Math>:BCMATH <operator>

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<operator>: Basic operation

Data Format	Setting
CHARACTER PROGRAM DATA	ADD, SUB, MUL, DIV ADD: Set to operator +. SUB: Set to operator -. MUL: Set to operator ×. DIV: Set to operator ÷.

- Query

Query syntax

<Math>:BCMATH?

RESPONSE MESSAGE

<operator>

Parameter	Data Format
<operator>	CHARACTER RESPONSE DATA

3.5.6. MFSC Command (Vertical axis automatic scale)

MFSC Command automatically adjusts the vertical scale and position of the specified Math.

■ Command

Command syntax

<Math>:MFSC

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

Remarks

- When MFSC Command is executed, the vertical scale and position are adjusted so that the calculated waveform fits within ± 3div of the screen.
- Executing the MFSC Command when the specified Mathe not drawn will result in an execution error (EXE).

3.5.7. FSRC Command / Query (FFT Source channel)

FSRC Command sets the FFT Source channel for the Specified Math.

FSRC? Query queries the FFT Source channel of the Specified Math.

■ Command

Command syntax

<Math>:FSRC <fft_source>

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<fft_source>: FFT Source channel

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

Remarks

- FSRC Command sets MATH's FFT Source channel. Use MATHS Command for MATH Source channels other than FFT.
- The conditions for selectiong MATH as the source are as follows.

Condition	Selectable
Math source is only channel source.	Yes
Math source contains Math source.	No
Math type is FFT	No
Same Math as Math to select source[Note]	No

Note: (Example) Math1 cannot be selected as the source for Math1.

■ Query

Query syntax

<Math>:FSRC?

RESPONSE MESSAGE

<fft_source>

Parameter	Data Format
<fft_source>	CHARACTER RESPONSE DATA

3.5.8. FWINDOW Command / Query (FFT window function)

FWINDOW Command sets the FFT window function of the specified Math.

FWINDOW? Query queries the FFT window function of the specified Math.

- Command

Command syntax

<Math>:FWINDOW <fft_window>

<Math> : Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<fft_window>: FFT window function

Data Format	Setting
CHARACTER PROGRAM DATA	RECT, VONHANN, FLATTOP RECT: Set window function Rectangular VONHANN: Set window function VonHann FLATTOP: Set window function Flat Top.

- Query

Query syntax

<Math>:FWINDOW?

RESPONSE MESSAGE

<fft_window>

Parameter	Data Format
<fft_window>	CHARACTER RESPONSE DATA

3.5.9. FHZSCALE Command / Quer (FFT Horizontal axis frequency scale)

FHZSCALE Command sets the specified Math Horizontal axis frequency scale.

FHZSCALE? Query queries the Horizontal axis frequency scale of the specified Math.

- Command

Command syntax

<Math>:FHZSCALE <fft_scale>

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<fft_scale>: FFT Horizontal axis frequency scale

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	12.5mHz to 250MHz

- Query

Query syntax

<Math>:FHZSCALE?

RESPONSE MESSAGE

<fft_scale>

Parameter	Data Format
<fft_scale>	NR3 NUMERIC RESPONSE DATA

3.5.10. FHZPOS Command / Query (FFT Frequency position)

FHZPOS Command sets the Frequency position of the specified Math.

FHZPOS? Query queries the Frequency position of the specified Math.

■ Command

Command syntax

<Math>:FHZPOS <fft_hpos>

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<fft_hpos>: FFT frequency position

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-(FFT_Scale × 12) to (FFT_Scale × 12)

Remarks

The range of <fft_hpos> changes depending on the Setting of FHZSCALE.

■ Query

Query syntax

<Math>:FHZPOS?

RESPONSE MESSAGE

<fft_hpos>

Parameter	Data Format
<fft_hpos>	NR3 NUMERIC RESPONSE DATA

3.5.11. FDELTA? Query (Frequency resolution)

FDELTA? Query queries the frequency resolution of the FFT in Hz.

- Query

Query syntax

FDELTA?

RESPONSE MESSAGE

<value>

<value>: FFT frequency resolution

Parameter	Data Format
<value>	NR3 NUMERIC RESPONSE DATA

Remarks

When the waveform is not drawn, get an error response (+9.9100000E + 37).

3.5.12. SMAMATH Command / Query (MATH SMA processing width)

SMAMATH command sets the processing width of Math SMA.

The SMAMATH? Query gets the SMA processing width for the specified Math.

- Command

  Command syntax

  <Math>:SMAMATH <width>

  <Math> : Math header

Data Format	Setting
Command program header	M1, M2, M3, M4, M5, M6, M7, M8

  <width> : SMA processing width

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	1～128

- Query

  Query syntax

  <Math>:SMAMATH?

  RESPONSE MESSAGE

  <width>

Parameter	Data Format
<width>	NR1 NUMERIC RESPONSE DATA

3.5.13. MUNI Command / Query (MATH Vertical axis unit)

MUNI Command sets the unit of the vertical axis for the specified input Math.

MUNI? Query queries the units o the specified vertical axis.

- Command

  Command syntax

  <Math>:MUNI<unit>

  <Math> : Math header

Data Format	Setting
Command program header	M1, M2, M3, M4, M5, M6, M7, M8

  <unit> : Input math unit name

Data Format	Setting
CHARACTER PROGRAM DATA	Enclose the characters you want to set with double caution (“).

  Remarks

  - <unitl> can be up to 3 characters. After 4th characters will be truncated.
  - The unit character string set by MUNI command is displayed on the screen only when the “automatic unit” is Off.

- Query

  Query syntax

  <Math>:MUNI?

  RESPONSE MESSAGE

  <unit>

Parameter	Data Format
<unit>	CHARACTER RESPONSE DATA

  Remarks

  - When the automatic unit is ON, the set unit character string is acquired instead of the unit character string displayed on the screen.

3.5.14. MAUNI Command / Query (Math's automatic unit)

MAUNI Command sets Math's automatic unit ON / OFF.

MAUNI? Query queries the status (ON / OFF) of Math's automatic unit.

- Command

  Command syntax

  <Math>:MAUNI <function>

  <Math> : Math header

Data Format	Setting
Command program header	M1, M2, M3, M4, M5, M6, M7, M8

  <function> : Maths's automatic unit ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

  Query syntax

  <Math>:MAUNI?

  RESPONSE MESSAGE

  <function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.5.15. FSCN Command / Query (Set screen as FFT source)

FSCN Command sets the screen that will be the FFT source.

FSCN? Query retrieves the screen that will be the FFT source.

■ Command

Command syntax

<Math>:FSCN <screen>

<Math> : Math header

Data Format	Setting
Command program header	M1, M2, M3, M4, M5, M6, M7, M8

<screen> : screen to be the FFT source

Data Format	Setting
CHARACTER PROGRAM DATA	MAIN, ZOOM1, ZOOM2

Remarks

Selecting a ZOOM that is not displayed on <screen> with the parameter will result in a device specific error (DDE).

■ Query

Query syntax

<Math>:FSCN?

RESPONSE MESSAGE

<screen>

Parameter	Format
<screen>	CHARACTER RESPONSE DATA

3.5.16. CPMEM Command / Query (Copy waveform data to Math memory)

CPMEM Command copies the waveform data of the specified CH or Math to Math memory.

CPMEM? Query retrieves Math memory settings.

■ Command

Command syntax

<Math>:CPMEM <src>,<savetostrorage>

<Math> : Math header

Data Format	Setting
Command program header	M1, M2, M3, M4, M5, M6, M7, M8

<src> : Math memory source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<savetostorage> : save to non-volatile memory

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

■ Query

Query syntax

<Math>:CPMEM?

RESPONSE MESSAGE

<src>,<savetostrorage>

Parameter	Format
<src>	CHARACTER RESPONSE DATA
<savetostorage>.	CHARACTER RESPONSE DATA

3.5.17. IMPMF Command (import from file to Math memory)

INPMF Command imports waveform data from a file (extension ref) into Math memory.

■ Command

Command syntax

<Math>:INPMF <file>

<Math> : Math header

Data Format	Setting
Command program header	M1, M2, M3, M4, M5, M6, M7, M8

<file> : File path you want to save

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

Remarks

- Some characters cannot be used in <file>. The following characters cannot be used.
  ¥:*?”<>|
- Using these characters will result in a Command error (CME). However, double coating (“) can only be used by enclosing the <file> string.

3.5.18. EXPMF Command (export Math memory to file)

EXPMF Command exports Math memory waveform data to a file (extension ref).

■ Command

Command syntax

<Math>:EXPMF <file>

<Math> : Math header

Data Format	Setting
Command program header	M1, M2, M3, M4, M5, M6, M7, M8

<file> : file path to export

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

Remarks

- Some characters cannot be used in <file>. The following characters cannot be used.
  ¥:*?”<>|
- Using these characters will result in a Command error (CME). However, double coating (“) can only be used by enclosing the <file> string.

3.5.19. MMET? Query (get Math memory get date)

MMET? Query retrieves the date and time when the waveform data is copied into Math memory.

■ Query

Query syntax

<Math>:MMET?

RESPONSE MESSAGE

<timestamp>

Parameter	Format
<timestamp>	character response data

Remarks

If there is no waveform in Math memory, "1970/01/01 00:00:00" is responded.

3.6. HORIZONTAL CONTROL GROUP

3.6.1. TDIV Command / Query (Horizontal axis range)

TDIV Command sets Time/div.

TDIV? Query queries the current Time/div.

■ Command

Command syntax

TDIV <value>

<value>: Time/div Parameter

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	See table below

For TDIV Command, the value of <value> is rounded as follows:

Rounding range	Time base	Note
value <= 200 E-12	200 ps/div	For 200 ps/div, It can be set with DS-8108 / 8104.
200 E-12 <value <= 500 E-12:: 10 <value <= 20 20 <value	500 ps/div 20 s/div 50 s/div	500 ps/div can be set on all models.

Remarks

When TFINE Command is ON, <value> can be set to a finer value.

■ Query

Query syntax

TDIV?

RESPONSE MESSAGE

<value>

Parameter	Data Format
<value>	NR3 NUMERIC RESPONSE DATA

3.6.2. TFINE Command / Query (Switching the horizontal axis range Fine)

TFINE Command sets Fine ON / OFF for the horizontal axis range.

TFINE? Query queries Fine ON / OFF for the current horizontal axis range.

- Command

Command syntax

TFINE <function>

<function>: Time/div Fine ON / OFF.

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

TFINE?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.6.3. TRDL Command / Query (Position of Trigger point)

TRDL Command sets the position of the Trigger point in hours.When the center of the screen is set to 0, the duration from the 0 point to the Trigger point will be set. The setting range is determined on a time basis (TDIV).

TRDL? Query queries the horizontal position set at the Trigger point.

- Command

Command syntax

TRDL<value>

<value>: Trigger delay value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-500 s to +750 s (Trigger Mode is STOP) -500 s to +6 div (10 ms to 50 s/div) -5 s to +6 div (10 µs to 5 ms/div) -5 ms to +6 div (up to 5 µs/div)

- Query

Query syntax

TRDL?

RESPONSE MESSAGE

<value>

Parameter	Data Format
<value>	NR3 NUMERIC RESPONSE DATA

3.6.4. MODE Command / Query (Sample Mode)

The MODE command sets the sample mode.

The MODE? Query queries the current sample mode.

- Command

Command syntax

MODE<mode>

<mode>: sample mode

Data Format	Setting
CHARACTER PROGRAM DATA	RTIME. EQU, ROLL, SEQ

Remarks

When the WAVDISP command is XY, XY_SINGLE, XY_SPLIT and the MODE command ROLL is executed, the WAVDISP command becomes SINGLE.

- Query

Query syntax

MODE?

RESPONSE MESSAGE

<mode>

parameter	Data Format
<mode>	RESPONSE MESSAGE

3.6.5. ACQ Command / Query (Acquisition mode selection)

ACQ Command sets Acquisition mode.

ACQ? Query queries the current Acquisition mode.

- Command

Command syntax

ACQ <mode>

<mode>: Waveform capture mode

Data Format	Setting
CHARACTER PROGRAM DATA	NORMAL, PEAK, AVERAGE, HIGH_RESO, SINE, HIGH_RESO, SINE, ADV_HIGH_RESO Each Setting is as follows. NORMAL: Normal PEAK: Peak Detect AVERAGE: Average HIGH_RESO: High Resolution SINE: Sin(x)/x Interpol ADV_HIGH_RESO: Advanced high resolution

- Query

Query syntax

ACQ?

RESPONSE MESSAGE

<mode>

Parameter	Data Format
<mode>	CHARACTER RESPONSE DATA

3.6.6. HPRF Command / Query (Preference for the Horizontal axis)

HPRF Command sets Preference for the Horizontal axis.

HPRF? Query queries the current Preference for the Horizontal axis.

- Command

Command syntax

HRPF <mode>

<mode>: Priority mode for Horizontal axis

Data Format	Setting
CHARACTER PROGRAM DATA	RATE, MEMORY RATE: Set Preference to Sampling Rate. MEMORY: Set Preference to Max Memory.

- Query

Query syntax

HRPF?

RESPONSE MESSAGE

<mode>

Parameter	Data Format
<mode>	CHARACTER RESPONSE DATA

3.6.7. MLEN Command / Query (Maximum memory length)

MLEN Command sets the maximum memory length.

MLEN? Query queries the current maximum memory length.

■ Command

Command syntax

MLEN <length>

<length>: Maximum memory length

Data Format	Setting
CHARACTER PROGRAM DATA	1.5 K, 15 K, 150 K, 1.5 M, 15 M, 30 M, 60 M, 120 M

Remarks

Setting of MLEN Command is not enabled when HRPF Command is set to RATE.

■ Query

Query syntax

MLEN?

RESPONSE MESSAGE

<length>

Parameter	Data Format
<length>	CHARACTER RESPONSE DATA

Remarks

When HRPF Command is set to RATE, MLEN? Query queries the Setting that has already been set.

3.6.8. RMLEN? Query (Real memory length)

RMLEN? Query queries actual memory length.

- Query

Query syntax

RMLEN?

RESPONSE MESSAGE

<length>

<length>: Actual memory length of waveform

Parameter	Data Format
<length>	NR3 NUMERIC RESPONSE DATA

3.6.9. SMPR Command / Query (Sampling rate)

SMPR Command sets the Sampling rate.

SMPR? Query queries the current Sampling rate.

■ Command

Command syntax

SMPR <rate>

<rate>: Sampling rate

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	2.5, 5, 12.5, 25, 50, 125, 250, 500, 1.25K, 2.5K, 5K, 12.5K, 25K, 50K, 125K, 250K, 500K, 1.25M, 2.5M, 5M, 12.5M, 25M, 50M, 125M, 250M, 500M, 1.25G, 2.5G, 5G

Remarks

- 5G can be set only during interleaving. Please refer to the Instruction Manual for interleaving.
- When you enter anything other than setting, it will be rounded to the number closest to the setting.
- When HRPF Command is set to MEMORY, SMPR Command's setting is not enabled.

■ Query

Query syntax

SMPR?

RESPONSE MESSAGE

<rate>

Parameter	Data Format
<rate>	NR3 NUMERIC RESPONSE DATA

Remarks

When HRPF Command is set to MEMORY, the automatically determined sampling rate is obtained.

3.6.10. AVGCNT Command / Query (Setting the number of averaging)

AVGCNT Command sets the number of averaging

AVGCNT? Query queries the current number of averaging

■ Command

Command syntax

AVGCNT <number>

<number>: Average number of waveform captures

Format	Setting
CHARACTER PROGRAM DATA	2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536

Remarks

Executing AVGCNTCommand when ACQCommand is other than AVERAGE will result in a device-specific error (DDE).

■ Query

Query syntax

AVGCNT?

RESPONSE MESSAGE

<number>

Parameter	Data Format
<number>	CHARACTER RESPONSE DATA

3.6.11. GTRE? Query (Vertical axis resolution in high resolution mode)

GTRE? Query queries the Vertical axis resolution in High Resolution mode or Advanced high resolution mode.

- Query

Query syntax

GTRE?

RESPONSE MESSAGE

<hrbits>: Vertical axis resolution in High Resolution mode

Parameter	Data Format
<hrbits>	NR3 NUMERIC RESPONSE DATA

Remarks

If ACQ is set to anything other than HIGH_RESO or ADV_HIGH_RESO, the GTRE query will get "+9.9100000E +37".

3.6.12. SWTIM? Query (Waveform acquisition time)

SWTIM? Query queries the acquisition time of the displayed waveform

■ Query

Query syntax

SWTIM?

RESPONSE MESSAGE

<date>

Parameter	Data Format	Description
<date>	CHARACTER RESPONSE DATA	Time to acquire the waveform The acquisition data format of <d ata> is as follows. YYYY/MM/DD hh:mm:ss.sss

Remarks

When the waveform is not drawn, <data> gets "9999/99/99 99: 99: 99.999".

3.6.13. CLSWP Command (Clear)

CLSWP Command clears (initializes) the following items.

- Averaged waveform
- Persistence waveform
- Minimum value [Min], Maximum value [Max], mean [Mean], standard deviation [Std dev] and number of measurements [Num] of Automatic Measurement result
- History

■ Command

Command syntax

CLSWP

3.6.14. SEQCNT Command / Query (Number of segments for sequence capture)

The SEQCNT command sets the number of segments for sequence capture.

The SEQCNT? Query gets the number of segments in the current sequence capture.

- Command

Command syntax

SEQCNT <count>

<count> : Number of segments

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	1～32768

Remarks

The maximum value of <count> changes depending on the combination of memory length, deskew, etc.

- Query

Query syntax

SEQCNT?

RESPONSE MESSAGE

<count>

Parameter	Data Format
<count>	NR1 NUMERIC RESPONSE DATA

3.6.15. SEQTIM? Query (Time difference of waveform acquisition for sequence capture)

The SEQTIM? Query gets the time difference from the previous waveform when capturing the sequence.

■ Query

Query syntax

SEQTIM?

RESPONSE MESSAGE

<stamp>

Parameter	Data Format
<stamp>	NR3 NUMERIC RESPONSE DATA

Remark

- When you execute the SEQTIM? Query when MODE is not SEQ, it will be "+9.9100000E + 37".
- When the previous waveform does not exist, it will be "+9.9100000E + 37".

3.7. TRIGGER GROUP

3.7.1. TRMD Command / Query (Trigger Mode)

TRMD Command sets Trigger Mode.

TRMD? Query queries the current Trigger Mode.

- Command

Command syntax

TRMD <mode>

<mode>: Trigger Mode

Data Format	Setting
CHARACTER PROGRAM DATA	AUTO, NORMAL, SINGLE, STOP

Remarks

TRMD Command only switches Trigger Mode. When you want Trigger to be RUN, use RUN Command.

- Query

Query syntax

TRMD?

RESPONSE MESSAGE

<mode>

Parameter	Data Format
<mode>	CHARACTER RESPONSE DATA

3.7.2. TRST? Query (Trigger status)

TRST? Query queries the current Trigger status.

■ Query

Query syntax

TRST?

RESPONSE MESSAGE

<status>

<status>: Response

<status>	Description
STOP	Trigger Stop
AUTO	Trigger Auto
INHIBIT	Inhibit state (Trigger is ignored)
TRIGD	Trigger Detected
READY	Trigger Waiting state

<status>: Trigger status

Parameter	Data Format
<status>	CHARACTER RESPONSE DATA

3.7.3. TTYP Command / Query (Trigger Type)

TTYP Command sets Trigger Type.

TTYP? Query queries the current Trigger Type.

- Command

Command syntax

TTYP <type>

<type>: TriggerType

Data Format	Setting
CHARACTER PROGRAM DATA	EDGE, EDGEALT, EDGEOR, COUNT, WIDTH, PERIOD, DROPOUT, OR, NOR, AND, NAND, UART, SPI, I2C, SEQUENCE, TRTIME

- Query

Query syntax

TTYP?

RESPONSE MESSAGE

<type>

Parameter	Data Format
<type>	CHARACTER RESPONSE DATA

3.7.4. TSRC Command / Query (Trigger Source)

TSRC Command sets Trigger Source.

TSRC? Query queries the current Trigger Source.

■ Command

Command syntax

TSRC <source>

<source>: Trigger Source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8, LINE, BUS1, BUS2} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4, LINE, BUS1, BUS2} (DS-8104 / 8054 / 8034) The following source changes depending on the external trigger (DS-601) option. · Not load external trigger (DS-601) option {LINE} (For all models) · Load external trigger (DS-601) option {EXT05, EXT12} (For all models)

Remarks

- It can be set to TSRC LINE, EXT05 or EXT12(load external trigger) only when TTYP is EDGE.
- L INE cannot be set when the trigger type of A trigger is EDGE, resulting in a device-specific error (DDE).
- When TTYP is not UART, SPI, I2C, the TSRC BUS1 or TSRC BUS2 command will not be executed and will result in a device-specific error (DDE).
- When T TYP is UART, SPI, I2C, the trigger source can be set only for BUS that matches the set trigger type. All other trigger sources will result in device-specific errors (DDE).

■ Query

Query syntax

TSRC?

RESPONSE MESSAGE

<source>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA

Remarks

When the Trigger Type set in TTYP and the BTYP Type set in BUS do not match any BUS, when TSRC? Query is executed, "NONE" is acquired.

3.7.5. TCPL Command / Query (Trigger Coupling)

TCPL Command sets Trigger Coupling.

TCPL? Query queries Trigger Coupling.

■ Command

Command syntax

TCPL <trig_coupling>

<trig_coupling>: Trigger Coupling

Data Format	Setting
CHARACTER PROGRAM DATA	AC, DC, HF, LF, NR AC: Trigger Coupling AC DC: Trigger Coupling DC HF: Trigger Coupling HF Reject LF: Trigger Coupling LF Reject NR: Trigger Coupling DC Noise Reject

Remarks

- When TTYP is EDGE OR, OR, NOR, AND, NAND, Trigger Coupling will be the Source set by TSRC Command. TCPL? Query also queries the DC.
- TTYP cannot set UART, SPI, I2C, TRTIME Coupling. A device-specific error (DDE) will occur. TCPL? Query also queries "DC".
- When TSRC is LINE, EXT05, EXT12, A device-specific error (DDE) will occur. TCPL? Query also queries "DC".

■ Query

Query syntax

TCPL?

RESPONSE MESSAGE

<trig_coupling >

Parameter	Data Format
<trig_coupling >	CHARACTER RESPONSE DATA

3.7.6. TLVL Command / Query (Trigger Level)

TLVL Command sets the Trigger Level of the Channel set in the Trigger Source.

TLVL? Query queries the Trigger Level of the Channel set in the Trigger Source.

■ Command

Command syntax

TLVL <trig_level>

<trig_level>: Trigger Level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6div to +6div

Remarks

- When TTYP is UART, SPI, I2C, a device-specific error (DDE) will occur. Also, TLVL? Query queries + 0.0000000E + 00.
- TTYP is Edge OR, OR, NOR, AND, NAND Trigger Level is the Source set by TSRC Command. Also, TLVL? Query queries "+ 0.0000000E + 00".
- When TSRC LINE, EXT05, EXT12, a device-specific error (DDE) will occur. Also, TLVL? Query queries + 0.0000000E + 00.

■ Query

Query syntax

TLVL?

RESPONSE MESSAGE

<trig_level>

Parameter	Data Format
<trig_level>	NR3 NUMERIC RESPONSE DATA

3.7.7. TFL Command (Auto Trigger Level)

TFL Command automatically adjusts the Trigger Level of Source set by TSRC Command.

- Command

Command syntax

TFL

Remarks

- When TTYP is UART, SPI or I2C, a device-specific error (DDE) will occur.
- When TTYP is EDGEOR, OR, NOR, AND or NAND, TFL Command is executed to the Source set by TSRC Command.
- Trigger Source Sets the Trigger Level in the center of the waveform amplitude.

3.7.8. TSLP Command / Query (Trigger slope)

TSLP Command sets Trigger slope.

TSLP? Query queries the current Trigger slope.

- Command

Command syntax

TSLP <slope>

<slope>: Trigger slope

Data Format	Setting
CHARACTER PROGRAM DATA	POS, NEG

Remarks

Executing TSLP Command when TTYP is EDGEALT, EDGEOR, OR, NOR, AND, NAND, UART, SPI or I2C will result in a device-specific error (DDE).

- Query

Query syntax

TSLP?

RESPONSE MESSAGE

<slope>

Parameter	Data Format
<slope>	CHARACTER RESPONSE DATA

Remarks

When TTYP is EDGEALT, EDGEOR, OR, NOR, AND, NAND, UART, SPI or I2C, when TSLP? Query is executed, "POS" is obtained.

3.7.9. TSTA Command / Query (Pattern trigger state)

TSTA Command sets the State of Trigger Source selected by TSRC Command of Pattern Trigger (EDGEOR, OR, NOR, AND, NAND).

TSTA? Query queries the current State.

■ Command

Command syntax

TSTA <state>

<state>: Trigger State

Data Format	Setting
CHARACTER PROGRAM DATA	DONTCARE, HIGH, LOW

Remarks

A device-specific error (DDE) that executes a TSTACommand when TTYP is set to anything other than EDGEOR, ON, NO, AND, NAND.

■ Query

Query syntax

TSTA?

RESPONSE MESSAGE

<state>

Parameter	Data Format
<state>	CHARACTER RESPONSE DATA

Remarks

When you execute TSTA? Query when TTYP is set to other than EDGEOR, ON, NO, AND, NAND, you will get "DONTCARE".

3.7.10. THTM Command / Query (Hold off time)

THTM Command sets Trigger Hold off time.

THTM? Query queries Hold off time.

■ Command

Command syntax

THTM <holdoff>

<holdoff>: Trigger Hold off time

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0s to 50.0s

Remarks

- When THTMCommand is executed when TTYP is other than EDGE or EDGEALT, a device-specific error (DDE) will occur.
- Hold off is off if <hold off> is less than 200ns.

Example of use

① Hold off sets off.

THTM 0s

② Hold off time sets 100ms.

THTM 100ms

■ Query

Query syntax

THTM?

RESPONSE MESSAGE

<holdoff>

Parameter	Data Format
<holdoff>	NR3 NUMERIC RESPONSE DATA

Remarks

When you execute THTM? Query when Hold off is off, you will get "+ 0.0000000E + 00".

3.7.11. TCOUNT Command / Query (Number of pulses in Pulse Trigger)

TCOUNT Command sets Number of pulses in Pulse Trigger. (TTYP = COUNT)

TCOUNT? Query queries Number of pulses in Pulse Trigger.

■ Command

Command syntax

TCOUNT <count>

<count> : Number of pulses in Pulse Trigger

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	2 to 9999 (resolution: 1)

Remarks

Executing a TCOUNT Command when TTYP is other than COUNT will result in a device-specific error (DDE).

■ Query

Query syntax

TCOUNT?

RESPONSE MESSAGE

<count>

Parameter	Data Format
<count>	NR1 NUMERIC RESPONSE DATA

3.7.12. TWTM Command / Query (Pulse width Trigger)

TWTM Command sets the parameter of Pulse width Trigger.

TWTM? Query queries the current parameter of Pulse width Trigger.

■ Command

Command syntax

TWTM <when>,<m>,<n>

<when>: TriggerType

Data Format	Setting
CHARACTER PROGRAM DATA	M_T, T_M, M_T_N, T_M_N_T M_T: Pulse widthTrigger time condition is「m <= t」 T_M: Pulse widthTrigger time condition is「t <= m」 M_T_N: Pulse widthTrigger time condition is「m <= t <= n」 T_M_N_T: Pulse widthTrigger time condition is「t <= m、n<=t」

<m> : 「m」Time value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	30ns to 50.0s

<n> : 「n」Time value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	35ns to 50.0s(when = M_T_N) 40ns to 50.0s(when = T_M_N_T)

Remarks

<m> and <n> are always m <n.

■ Query

Query syntax

TWTM?

RESPONSE MESSAGE

<when>,<m>,<n>

Parameter	Data Format
<when>	CHARACTER RESPONSE DATA
<m>	NR3 NUMERIC RESPONSE DATA
<n>	NR3 NUMERIC RESPONSE DATA

3.7.13. TPTM Command / Query (Priod Trigger)

TPTM Command sets Priod Trigger.

TPTM? Query queries Priod Trigger.

■ Command

Command syntax

TPTM <when>,<m>

<when>: Priod Trigger Interval time condition

Data Format	Setting
CHARACTER PROGRAM DATA	M_T, T_M M_T: Interval time condition is「m <= t」 T_M: Interval time condition is「t <= m」

<m> : 「m」time value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	40ns to 50.0s

Remarks

Executing TPTM Command when TTYP is not PERIOD will result in a device-specific error (DDE).

■ Query

Query syntax

TPTM?

RESPONSE MESSAGE

<when>,<m>

Parameter	Data Format
<when>	CHARACTER RESPONSE DATA
<m>	NR3 NUMERIC RESPONSE DATA

3.7.14. TDTM Command / Query (Dropout Trigger)

TDTM Command sets Dropout Time of Dropout Trigger. (TTYP = DROPOUT)

TDTM? Query queries Dropout Time of Dropout Trigger.

■ Command

Command syntax

TDTM <time>

<time>: Dropout Time of Dropout Trigger

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	50.0 ns to 50.0 s

Remarks

Executing TDTM Command when TTYP is other than DROP OUT will result in a device-specific error (DDE).

■ Query

Query syntax

TDTM?

RESPONSE MESSAGE

<time>

Parameter	Data Format
<time>	NR3 NUMERIC RESPONSE DATA

3.7.15. FRQCNT? Query (Trigger frequency)

FRQCNT? Query queries the Trigger frequency measured by the internal Trigger frequency counter.

■ Query

Query syntax

FRQCNT?

RESPONSE MESSAGE

<value>

<value>: Trigger frequency

Parameter	Data Format
<value>	NR3 NUMERIC RESPONSE DATA

Remarks

When TTYP is EDGEALT, OR, NOR, AND, NAND, get +9.9100000E +37.

3.7.16. TUART Command / Query (Trigger condition for UART)

TUART Command sets Trigger condition for UART.

TUART? Query queries the current Trigger condition for UART.

- Command

Command syntax

TUART <source>,<trig>,<coupling>

<source>: TriggerSourceBUS

Data Format	Setting
CHARACTER PROGRAM DATA	BUS1, BUS2

<trig>: UARTTriggerType

Data Format	Setting
CHARACTER PROGRAM DATA	START, STOP, DATA, PERRPR START: Trigger sets Start. STOP: Trigger sets Stop. DATA: Trigger sets Data. PERRPR: Trigger sets Parity Error.

<coupling>: UART Coupling

Data Format	Setting
CHARACTER PROGRAM DATA	DC, HF, NR DC: UART Coupling DC HF: UART Coupling HF Reject NR: UART Coupling DC Noise Reject

- Query

Query syntax

TUART?

RESPONSE MESSAGE

<source>,<trig>,<coupling>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<trig>	CHARACTER RESPONSE DATA
<coupling>	CHARACTER RESPONSE DATA

3.7.17. TUARFD Command / Query (UART data settings)

TUARFD Command sets the data that is the condition of Trigger of UART.

TUARFD? Query queries the data that is the Trigger condition of the current UART.

■ Command

Command syntax

TUARFD <data>

<data>: Data that is a Trigger condition for UART

Data Format	Setting
CHARACTER PROGRAM DATA	5-8 digit binary data (0, 1, X can be used)

Remarks

It is a 5-8 digit binary number of <data>. The number of digits is set by <numbit> of BUART. When the number of digits does not match, a Command error (CME) will occur.

Example of use

Set "111000XX" for the data that is the Trigger condition of UART

TUARFD 111000XX

■ Query

Query syntax

TUARFD?

RESPONSE MESSAGE

<data>

Parameter	Data Format
<data>	CHARACTER RESPONSE DATA

3.7.18. TSPI Command / Query (SPI Trigger condition)

TSPI Command sets the condition of は SPI Trigger.

TSPI? Query queries the current condition of SPI Trigger.

■ Command

Command syntax

TSPI <source>,<signal>,<bits>,<data>,<coupling>

<source>: TriggerSourceBUS

Data Format	Setting
CHARACTER PROGRAM DATA	BUS1, BUS2

<signal>: Signal line

Data Format	Setting
CHARACTER PROGRAM DATA	MOSI, MISO

<bits>: Bit width

Data Format	Setting
CHARACTER PROGRAM DATA	4 to 64

<data>: SPI Data

Data Format	Setting
CHARACTER PROGRAM DATA	Binary data (0, 1, X can be used)

<coupling>: SPI Coupling

Data Format	Setting
CHARACTER PROGRAM DATA	DC, HF, NR DC: SPI Coupling DC HF: SPI Coupling HF Reject NR: SPI Coupling DC Noise Reject

Remarks

The amount of data in <data> should be the same as the value in <bits>. When it is insufficient or excessive than the value of <bits>, a command error (CME) will occur.

Example of use

- Set SPI Trigger conditions
- (<source> = BUS1、<signal> = MOSI、<bits> = 5、<data> = 1100X、<coupling> = DC)

TSPI BUS1,MOSI,5,1100X,DC

Same length as the value of <bits>

■ Query

Query syntax

TSPI?

RESPONSE MESSAGE

<source>,<signal>,<bits>,<data>,<coupling>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<signal>	CHARACTER RESPONSE DATA
<bits>	NR1 NUMERIC RESPONSE DATA
<data>	CHARACTER RESPONSE DATA
<coupling>	CHARACTER RESPONSE DATA

3.7.19. TI2C Command / Query (I2C Trigger condition)

TI2C Command sets the conditions for I2C Trigger.

TI2C? Query queries the parameter of the current I2C Trigger.

■ Command

Command syntax

TI2C <source>,<coupling>,<trig>

<source>: Trigger Source BUS

Data Format	Setting
CHARACTER PROGRAM DATA	BUS1, BUS2

<trig>: I2C Trigger Type

Data Format	Setting
CHARACTER PROGRAM DATA	START, STOP, NOACK, RESTART, ADDAT7, ADDAT10 ・START: Trigger sets START. ・STOP: Trigger sets STOP. ・NOACK: Trigger sets NOACK. ・RESTART: Trigger sets RESTART. ・EEPREAD: Trigger sets EEPREAD. ・ADDAT7: Trigger sets 7bit Address & Data. ・ADDAT10: Trigger sets 10bit Address & Data.

<coupling>: I2C Coupling

Data Format	Setting
CHARACTER PROGRAM DATA	DC, HF, NR DC: I2C CouplingDC HF: I2C CouplingHF Reject NR: I2C CouplingDC Noise Reject

■ Query

Query syntax

TI2C?

RESPONSE MESSAGE

<source>,<coupling>,<trig>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<coupling>	CHARACTER RESPONSE DATA
<trig>	CHARACTER RESPONSE DATA

3.7.20. TIDAT Command / Query (I2C Trigger address and data)

TIDAT Command sets the address and data of the I2C Trigger.

TIDAT? Query queries the current I2C Trigger address and data.

- Command

Command syntax

TIDAT <address>,<rw>, <length>,<data>

<address>: I2C address

Data Format	Setting
CHARACTER PROGRAM DATA	00-7F (7-bit address) 000-3FF (10-bit address)

<rw>: I2C READ, WRITE, RW

Data Format	Setting
CHARACTER PROGRAM DATA	READ, WRITE, RW

<length>: I2C data length

Data Format	Setting
CHARACTER PROGRAM DATA	1 to 5

<data>: I2C data

Data Format	Setting
CHARACTER PROGRAM DATA	Binary data (0, 1, X can be used)

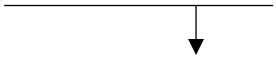
Remarks

- For <data>, enter the same amount of data as length (<length> value x 8). Insufficient or excessive will result in a command error (CME).
- When the Trigger Type of I2C is other than 7-bit address or 10-bit address, the response will get the parameter of 7-bit address.

Example of use

- Set I2C Trigger conditions (<address> = 11、<rw> = READ、<length> = 2、<data> = 0000011111XXXXXX)

TIDAT 11,READ,2,0000011111XXXXXX



<length> x 8 length

■ Query

Query syntax

TIDAT?

RESPONSE MESSAGE

<address>,<rw>,<length>,<data>

Parameter	Data Format
<address>	CHARACTER RESPONSE DATA
<rw>	CHARACTER RESPONSE DATA
<length>	CHARACTER RESPONSE DATA
<data>	CHARACTER RESPONSE DATA

3.7.21. TIEEP Command / Query (I2C Trigger judgment conditions and data settings)

TIEEP Command sets the conditions and data of I2C Trigger.

TIEEP? Query queries the current judgment conditions and data of I2C Trigger.

- Command

Command syntax

TIEEP <if>,<data>

<if>: I2C Trigger Judgment code

Data Format	Setting
CHARACTER PROGRAM DATA	EQ, NE, GT, LT EQ: Represents an equal sign. NE: Represents a negative equal sign. GT: Represents a greater inequality sign. LT: Represents a small inequality sign.

<data> : I2C Trigger judgment data

Data Format	Setting
CHARACTER PROGRAM DATA	Hexagonal numbers 00 to FF (X can also be used)

- Query

Query syntax

TIEEP?

RESPONSE MESSAGE

<if>,<data>

Parameter	Data Format
<if>	CHARACTER RESPONSE DATA
<data>	CHARACTER RESPONSE DATA

3.7.22. TDTIM Command / Query(Sequence trigger delay timer)

The TDTIM command sets the sequence trigger delay timer.

The TDTIM? Query gets the delay timer for the current sequence trigger.

■ Command

Command syntax

TDTIM <delay>

<delay> : Delay timer

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	30ns～50s

Remark

To enable the sequence trigger delay timer, turn on the TDSW command.

■ Query

Query syntax

TDTIM?

RESPONSE MESSAGE

<delay>

Parameter	Data Format
<delay>	NR3 NUMERIC RESPONSE DATA

3.7.23. TCTIM Command / Query (Sequence trigger clear timer)

The TCTIM command sets the sequence trigger clear timer.

The TCTIM? Query gets the clear timer for the current sequence trigger.

■ Command

Command syntax

TCTIM <clear>

<clear> : cCear timer

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	1μs～50s

Remark

To enable the sequence trigger clear timer, turn on the TCSW command.

■ Query

Query syntax

TCTIM?

RESPONSE MESSAGE

<clear>

Parameter	Data Format
<clear>	NR3 NUMERIC RESPONSE DATA

3.7.24. TDSW Command / Query (Delay timer on / off)

The TDSW command gets the delay timer on / off in the sequence trigger.

The TDSW? Query gets the current delay timer status (on / off).

■ Command

Command syntax

TDSW <function>

<function> : Delay timer on / off

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

■ Query

Query syntax

TDSW?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.7.25. TCSW Command / Query (Query timer on / off)

The TCSW command sets the declear timer on / off in the sequence trigger.

The TCSW? Query gets the current clear timer status (on / off).

■ Command

Command syntax

TCSW <function>

<function> : Query timer on / off

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

■ Query

Query syntax

TCSW?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.7.26. TTYPA Command / Query (A Trigger type)

The TTYPA command sets the A trigger type for sequence triggers.

The TTYPA? Query gets the A trigger type in a sequence trigger.

■ Command

Command syntax

TTYPA <type>

<type> :A Trigger type

Data Format	Setting
CHARACTER PROGRAM DATA	EDGE, COUNT, PERIOD, DROPOUT, UART, SPI, I2C

Remark

The parameters of each trigger type in A trigger can be set with the following remote commands.

A Trigger type	**Remote command**
EDGE	· TSRC Command · TCLP Command · TLVL Command
COUNT	· TCOUNT Command · TSRC Command · TCLP Command · TLVL Command
PERIOD	· TWTM Command · TSRC Command · TCLP Command · TLVL Command
DROPOUT	· TDTM Command · TSRC Command · TCLP Command · TLVL Command
UART	· TUART Command · TUARFD Command
SPI	· TSPI Command

I2C	· TI2C Command · TIDAT Command · TIEEP Command

■ Query

Query syntax

TTYPA?

RESPONSE MESSAGE

<type>

Parameter	Data Format
<type>	CHARACTER RESPONSE DATA

3.7.27. TTYPB Command / Query (B Trigger type)

TTYPB Command sets the B trigger type for sequence triggers.

The TTYPB? Query gets the B trigger type in a sequence trigger.

■ Command

Command syntax

TTYPB <type>

<type> :B Trigger type

Data Format	Setting
CHARACTER PROGRAM DATA	EDGE, COUNT, PERIOD, DROPOUT, UART, SPI, I2C

Remark

The parameters of each trigger type in B trigger can be set by the following remote command.

B Trigger type	Remote command
EDGE	· TSRCB Command · TCLPB Command · TLVLB Command
COUNT	· TCOUNTB Command · TSRCB Command · TCLPB Command · TLVLB Command
PERIOD	· TWTMB Command · TSRCB Command · TCLPB Command · TLVLB Command
DROPOUT	· TDTMB Command · TSRCB Command · TCLPB Command · TLVLB Command
UART	· TUARTB Command · TUARFDB Command
SPI	· TSPIB Command

I2C	· TI2CB Command · TIDATB Command · TIEEPB Command

■ Query

Query syntax

TTYPB?

RESPONSE MESSAGE

<type>

Parameter	Data Format
<type>	CHARACTER RESPONSE DATA

3.7.28. TSRCB Command / Query (B Trigger source)

TSRCB Command sets the source of the B trigger in the sequence trigger.

The TSRCB? Query gets the source of the current B trigger.

■ Command

Command syntax

TSRCB <source>

<source >: B Trigger source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8, BUS1, BUS2} (DS-8108/8058/8038) {CH1, CH2, CH3, CH4, BUS1, BUS2} (DS-8104/8054/8034)

Remark

- Use TSRC Command as the source of the A trigger.
- BUS1 and BUS2 sources can be set only when TTYPB is a serial trigger. Any other trigger type will result in a device-specific error (DDE).

■ Query

Query syntax

TSRCB?

RESPONSE MESSAGE

<source>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA

3.7.29. TCPLB Command / Query (B Trigger coupling)

TCPLB Command sets the coupling for the B trigger in the sequence trigger.

The TCPLB? Query gets the coupling to the B trigger of the sequence trigger.

■ Command

Command syntax

TCPLB <coupling>

<coupling> : BTrigger coupling

Data Format	Setting
CHARACTER PROGRAM DATA	AC, DC, HF, LF, NR AC : Trigger coupling AC DC : Trigger coupling DC HF : Trigger coupling HF Reject LF : Trigger coupling LF Reject NR : Trigger coupling DC Noise Reject

Remark

Coupling of TTYPB UART, SPI, I2C cannot be set. A device-specific error (DDE) will occur. The TCPLB? Query also gets "DC".

■ Query

Query syntax

TCPLB?

RESPONSE MESSAGE

<coupling>

Parameter	Data Format
<coupling >	CHARACTER RESPONSE DATA

3.7.30. TLVLB Command / Query (B trigger trigger level)

TLVLB Command sets the trigger level of the B trigger of the sequence trigger.

The TLVLB? Query gets the trigger level of the B trigger of a sequence trigger.

■ Command

Command syntax

TLVLB <level>

<level>: B trigger trigger level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6div～+6div

Remark

When TTYPB is UART, SPI, I2C, a device-specific error (DDE) will occur.

Also, the TLVLB? Query gets "+ 0.0000000E + 00".

■ Query

Query syntax

TLVLB?

RESPONSE MESSAGE

<level>

Parameter	Data Format
<level>	NR3 NUMERIC RESPONSE DATA

3.7.31. TFLB Command (B Trigger auto-trigger level)

TFLB Command automatically adjusts the trigger level for the B trigger source set in TSRCB.

■ Command

Command syntax

TFLB

Remark

- If TTYPB is UART, SPI, I2C, a device-specific error (DDE) will occur.
- If TTYP is other than SEQUENCE, a device-specific error (DDE) will occur.
- Set the trigger level in the center of the amplitude of the trigger source waveform.

3.7.32. TSLPB Command / Query (B Trigger slope)

TSLPB Command sets the slope of the B trigger in the sequence trigger.

TSLPB? Query gets the slope of the current B trigger

■ Command

Command syntax

TSLPB <slope>

<slope>: Trigger slope

Data Format	Setting
CHARACTER PROGRAM DATA	POS, NEG

Remark

- Executing the TSLPB Command when TTYPB is other than EDGE, COUNT, PERIOD, DROPOUT will result in a device-specific error (DDE).
- If TTYP is other than SEQUENCE, a device-specific error (DDE) will occur.

■ Query

Query syntax

TSLPB?

RESPONSE MESSAGE

<slope>

Parameter	Data Format
<slope>	CHARACTER RESPONSE DATA

Remark

If you execute a TSLPB? Query when TTYPB is other than EDGE, COUNT, PERIOD, DROPOUT, you will get "POS".

3.7.33. TCOUNTB Command / Query (Number of pulse count trigger as B trigger)

TCOUNTB Command sets the number of pulse count trigger as the B trigger in the sequence trigger.

The TCOUNTB? Query gets the number of pulse count trigger in the current B trigger.

■ Command

Command syntax

TCOUNTB <count>

<count> : Number of pulse count trigger as B trigger

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	2～9999 (resolution: 1)

Remark

- Executing the TCOUNTB Command when TTYPB is other than COUNT will result in a device-specific error (DDE).
- If TTYP is other than SEQUENCE, a device-specific error (DDE) will occur.

■ Query

Query syntax

TCOUNTB?

RESPONSE MESSAGE

<count>

Parameter	Data Format
<count>	NR1 NUMERIC RESPONSE DATA

3.7.34. TPTMB Command / Query (cycle trigger as B trigger)

TPTMB Command sets the period trigger of B trigger in the sequence trigger.

The TPTMB? Query gets the period trigger of the current B trigger.

■ Command

Command syntax

TPTMB <when>,<m>

<when>: Period trigger interval time condition as B trigger

Data Format	Setting
CHARACTER PROGRAM DATA	M_T, T_M M_T: Set the interval time condition to "m <= t" T_M: Set the interval time condition to "t <= m"

<m> : B trigger "m" time value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	40ns～50.0s

Remark

- If TTYPB is not PERIOD and TPTMB Command is executed, a device-specific error (DDE) will occur.
- If TTYP is other than SEQUENCE, a device-specific error (DDE) will occur.

■ Query

Query syntax

TPTMB?

RESPONSE MESSAGE

<when>,<m>

Parameter	Data Format
<when>	CHARACTER RESPONSE DATA
<m>	NR3 NUMERIC RESPONSE DATA

3.7.35. TDTMB Command / Query (Dropout trigger of B trigger)

TMB Command sets the missing time of the Dropout trigger for the B trigger in the sequence trigger.

The TDTMB? Query gets the missing time of the Dropout trigger in the current B trigger

■ Command

Command syntax

TDTMB <time>

<time>: Missing time of Dropout trigger as B trigger

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	50.0ns～50.0s

Remark

- If TTYPB is other than DROP OUT and TDTMB Command is executed, a device-specific error (DDE) will occu.
- If TTYP is other than SEQUENCE, a device-specific error (DDE) will occur.

■ Query

Query syntax

TDTMB?

RESPONSE MESSAGE

<time>

Parameter	Data Format
<time>	NR3 NUMERIC RESPONSE DATA

3.7.36. TUARTB Command / Query (UART trigger condition as B trigger)

TUARTB Command sets the UART trigger condition as the B trigger in the sequence trigger.

The TUARTB? Query gets the condition of the UART trigger as the current B trigger.

■ Command

Command syntax

TUARTB <source>,<trig>,<coupling>

<source> : Trigger source BUS

Data Format	Setting
CHARACTER PROGRAM DATA	BUS1, BUS2

<trig> : UART trigger type

Data Format	Setting
CHARACTER PROGRAM DATA	START, STOP, DATA, PERRPR START: B Set the trigger to Start. STOP: B Sets the trigger to Stop. DATA: Set the B trigger to Data. PERRPR: Set the B trigger to Parity Error.

<coupling> : UART Coupling

Data Format	Setting
CHARACTER PROGRAM DATA	DC, HF, NR DC: UART coupling DC HF: UART Coupling HF Reject NR: UART Coupling DC Noise Reject

■ Query

Query syntax

TUARTB?

RESPONSE MESSAGE

<source>,<trig>,<coupling>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<trig>	CHARACTER RESPONSE DATA
<coupling>	CHARACTER RESPONSE DATA

3.7.37. TUARFDB Command / Query (UART data settings as B trigger)

TUARFDB Command sets the UART data as the B trigger in the sequence trigger.

The TUARFDB? Query gets the current B-triggered UART data.

■ Command

Command syntax

TUARFDB <data>

<data> : Data that is a trigger condition for UART

Data Format	Setting
CHARACTER PROGRAM DATA	5-8 digit binary data (0, 1, X can be used)

Remark

It is a 5-8 digit binary number of <data>. The number of digits is set by <numbit> of BUART. If the number of digits does not match, a command error (CME) will occur.

Example of use

Set "111000XX" for the data that is the trigger condition for UART

TUARFDB 111000XX

■ Query

Query syntax

TUARFDB?

RESPONSE MESSAGE

<data>

Parameter	Data Format
<data>	CHARACTER RESPONSE DATA

3.7.38. TSPIB Command / Query (SPI trigger condition as B trigger)

TSPIB Command sets the trigger condition of SPI as B trigger in sequence trigger.

The TSPIB? Query gets the SPI trigger condition for the current B trigger.

■ Command

Command syntax

TSPIB <source>,<signal>,<bits>,<data>,<coupling>

<source> : Trigger source BUS

Data Format	Setting
CHARACTER PROGRAM DATA	BUS1, BUS2

<signal> : Signal line

Data Format	Setting
CHARACTER PROGRAM DATA	MOSI, MISO

<bits> : Bit width

Data Format	Setting
CHARACTER PROGRAM DATA	4～64

<data> : SPI data

Data Format	Setting
CHARACTER PROGRAM DATA	Binary data (0, 1, X can be used)

<coupling> : SPI coupling

Data Format	Setting
CHARACTER PROGRAM DATA	DC, HF, NR DC: B trigger SPI coupling DC HF: B trigger SPI coupling HF Reject NR: B trigger SPI coupling DC Noise Reject

Remark

The amount of data in <data> should be the same as the value in <bits>. If it is insufficient or excessive than the value of <bits>, a command error (CME) will occur.

Example of use

Set SPI trigger conditions (<source> = BUS1、<signal> = MOSI、<bits> = 5、<data> = 1100X、<coupling> = DC)

TSPIB BUS1,MOSI,5,1100X,DC

Same length as the value of <bits>

■ Query

Query syntax

TSPIB?

RESPONSE MESSAGE

<source>,<signal>,<bits>,<data>,<coupling>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<signal>	CHARACTER RESPONSE DATA
<bits>	NR1 NUMERIC RESPONSE DATA
<data>	CHARACTER RESPONSE DATA
<coupling>	CHARACTER RESPONSE DATA

3.7.39. TI2CB Command / Query (I2C trigger condition as B trigger)

TI2CB Command sets the condition of I2C trigger as B trigger in sequence trigger.

The TI2CB? Query gets the conditions for the current I2C trigger.

■ Command

Command syntax

TI2CB <source>,<coupling>,<trig>

<source> : Trigger source BUS

Data Format	Setting
CHARACTER PROGRAM DATA	BUS1, BUS2

<trig> : I2C trigger type

Data Format	Setting
CHARACTER PROGRAM DATA	START, STOP, NOACK, RESTART, EEPREAD, ADDAT7, ADDAT10 -START: Set the trigger of the B trigger to START. -STOP: Set the trigger of the B trigger to STOP. -NOACK: Set the trigger of the B trigger to NOACK. -RESTART: Set the trigger of the B trigger to RESTART. -EEPREAD: Set the trigger of the B trigger to EEPREAD. -ADDAT7: Set the trigger of B trigger to 7bit Address & Data. -ADDAT10: Set the trigger of B trigger to 10bit Address & Data.

<coupling> : I2C Coupling

Data Format	Setting
CHARACTER PROGRAM DATA	DC, HF, NR DC: I2C coupling DC HF: I2C Coupling HF Reject NR: I2C Coupling DC Noise Reject

■ Query

Query syntax

TI2CB?

RESPONSE MESSAGE

<source>,<coupling>,<trig>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<coupling>	CHARACTER RESPONSE DATA
<trig>	CHARACTER RESPONSE DATA

3.7.40. TIDATB Command / Query (Address and data of I2C trigger as B trigger)

TIDATB Command sets the I2C trigger address and data as the B trigger in the sequence trigger.

The TIDATB? Query gets the address and data of the I2C trigger as the current B trigger.

■ Command

Command syntax

TIDATB <address>,<rw>,<length>,<data>

<address> : I2C address

Data Format	Setting
CHARACTER PROGRAM DATA	00-7F (7-bit address) 000-3FF (10-bit address)

<rw> : I2C の READ, WRITE, RW

Data Format	Setting
CHARACTER PROGRAM DATA	READ, WRITE, RW

<length> : I2C data length

Data Format	Setting
CHARACTER PROGRAM DATA	1～5

<data> : I2C data

Data Format	Setting
CHARACTER PROGRAM DATA	Binary data (0, 1, X can be used)

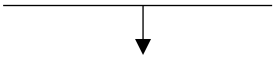
Remark

- For <data>, enter the same amount of data as length (<length> value x 8). Insufficient or excessive will result in a command error (CME).
- If the trigger type of I2C is other than 7-bit address or 10-bit address, the response will get the Parameter of 7-bit address.

Example of use

Set I2C trigger conditions (<address> = 11、 <rw> = READ、 <length> = 2、 <data> = 0000011111XXXXXX)

TIDATB 11,READ,2,0000011111XXXXXX



<length>×8 length

■ Query

Query syntax

TIDATB?

RESPONSE MESSAGE

<address>,<rw>,<length>,<data>

Parameter	Data Format
<address>	CHARACTER RESPONSE DATA
<rw>	CHARACTER RESPONSE DATA
<length>	CHARACTER RESPONSE DATA
<data>	CHARACTER RESPONSE DATA

3.7.41. TIEEPB Command / Query (Judgment conditions and data settings for I2C trigger as B trigger)

TIEEPB Command sets the I2C judgment condition and data for B trigger in sequence trigger.

The TIEEPB? Query gets the I2C trigger criteria and data as the current B trigger.

- Command

Command syntax

TIEEPB <if>,<data>

<if>: I2C Trigger judgment code

Data Format	Setting
CHARACTER PROGRAM DATA	EQ, NE, GT, LT EQ: Represents an equal sign. NE: Represents the negative equal sign. GT: Represents a greater inequality sign. LT: Represents a lesser inequality sign.

<data> : I2C Trigger judgment data

Data Format	Setting
CHARACTER PROGRAM DATA	Hexadecimal 00 to FF (X can also be used)

- Query

Query syntax

TIEEPB?

RESPONSE MESSAGE

<if>,<data>

Parameter	Data Format
<if>	CHARACTER RESPONSE DATA
<data>	CHARACTER RESPONSE DATA

3.7.42. TJR Command / Query (Trigger jitter reduction function)

The TRJ Command turns the trigger jitter reduction function ON/OFF.

The TRJ? Query retrieves the current ON/OFF status of the trigger jitter reduction function.

- Command

  Command syntax

  TRJ <jitter_reduction>

  <jitter_reduction >: Trigger reduction function

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

  Query syntax

  TRJ?

  RESPONSE MESSAGE

  <jitter_reduction>

Parameter	Data Format
<jitter_reduction>	CHARACTER RESPONSE DATA

3.7.43. TDLVL Command / Query (Transition time trigger level)

The TDLVL Command sets the Level(High) and Level(Low) of the transition time trigger.

The TDLVL? Query retrieves the Level(High) and Level(Low) of the current transition time trigger.

■ Command

Command syntax

TDLVL <level_low>,<level_high>

<level_low>: Level(Low)

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	(-4div voltage value) to (+4div voltage value)

<level_high>: Level(High)

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	(-4div voltage value) to (+4div voltage value)

Remarks

- When TTYP Command is not TRTIME, a device-specific error (DDE) occurs.
- If <level_low> is greater than <level_high>, the <level_low> and <level_high> values are swapped.

■ Query

Query syntax

TDLVL?

RESPONSE MESSAGE

<level_low>,<level_high>

Parameter	Data Format
<level_low>	NR3 NUMERIC RESPONSE DATA
<level_high>	NR3 NUMERIC RESPONSE DATA

3.7.44. TTR Command / Query (Trigger condition for transition time trigger)

The TTR Command sets the trigger condition for the transition time trigger.

The TTR? Query retrieves the trigger condition for the current transition time trigger.

- Command

  Command syntax

  TTR <trasition_time>,<m>,<n>

  <trasition_time>: Transition time conditions

Data Format	Setting
CHARACTER PROGRAM DATA	M_T, T_M, M_T_N, T_M_N_T

  <m>: Transition time m

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	· Interleaved 600ps~50.0s · Non-Interleaved 1.20ns~50.0s

  <n>: Transition time n

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	· Interleaved 2.60ns~50.0s · Non-Interleaved 3.20ns~50.0s

  Remarks

  · When TTYP Command is not TRTIME, a device-specific error (DDE) occurs.

  · <n> is always greater than <m>.

■ Query

Query syntax

TTR?

RESPONSE MESSAGE

<trasition_time>,<m>,<n>

Parameter	Data Format
<trasition_time>	CHARACTER RESPONSE DATA
<m>	NR3 NUMERIC RESPONSE DATA
<n>	NR3 NUMERIC RESPONSE DATA

3.8. AUTO SETUP GROUP

3.8.1. ASET Command (Auto setup)

ASET Command executes Auto setup.

■ Command

Command syntax

ASET <IntiProSet>, <VerRan>, <VerOff>, <HorSet>, <TriSet>

<IntiProSet> Initialize Probe settings

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<VerRan> Voltage axis Auto setup

Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<VerOff> Offset Auto setup

Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<HorSet> Time axis Auto setup

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<TriSet> Trigger settings Auto setup

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

3.9. CURSOR GROUP

3.9.1. CURM Command / Query (Cursor types settings)

CURM Command sets Cursor types.

CURM? Query queries the current Cursor types.

■ Command

Command syntax

CURM <mode>

<mode> : Cursor Type

Data Format	Setting
CHARACTER PROGRAM DATA	OFF, DV, DH, DHDV, VATH OFF : Cursor function off DV : CursorType Amplitude※ DH : CursorType Time※ DHDV : CursorType Time & Amplitude※ VATH : CursorType Value at cursor※

※For detailed specifications of CursorType, refer to Instruction Manual.

■ Query

Query syntax

CURM?

RESPONSE MESSAGE

<mode>

Parameter	Data Format
<mode>	CHARACTER RESPONSE DATA

3.9.2. CURS Command / Query (Setting the Source of the Cursor)

CURS Command sets the Source of the Cursor.

CURS? Query queries the current Source of Cursor.

■ Command

Command syntax

CURS <source>

<source> : Cursor Source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

■ Query

Query syntax

CURS?

RESPONSE MESSAGE

<source>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA

3.9.3. HCUR Command / Query (Cursor position of the horizontal axis)

HCUR Command sets the Cursor position of the horizontal axis.

HCUR? Query queries the current Cursor position of the horizontal axis.

■ Command

Command syntax

HCUR <cursor1>,<cursor2>

<coursor1> : Cursor 1 position of the horizontal axis

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6.00div to +6.00div

<coursor2> : Cursor 2 position of the horizontal axis

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6.00div to +6.00div

Remarks

- When CURM Command is not DH, DHDV, VATH and HCUR Command is executed, a device-specific error (DDE) will occur.
- When the Time Track of the Cursor is on and the HCUR Command is executed, the Time Track is turned off.

■ Query

Query syntax

HCUR?

RESPONSE MESSAGE

<cursor1>,<cursor2>

Parameter	Data Format
<cursor1>	NR3 NUMERIC RESPONSE DATA
<cursor2>	NR3 NUMERIC RESPONSE DATA

3.9.4. VCUR Command / Query (Amplitude Cursor position)

VCUR Command sets the Cursor position of the Vertical axis.

VCUR? Query queries the current Vertical axis Cursor position.

■ Command

Command syntax

VCUR <cursor1>,<cursor2>

<coursor1> : Cursor1 position of Vertical axis

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5.00div to +5.00div

<coursor2> : Cursor2 position of Vertical axis

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5.00div to +5.00div

Remarks

- When CURM Command is not DV or DHDV and VCUR Command is executed, a device-specific error (DDE) will occur.
- Cursor Amplitude When Cursor Amplitude Track is on and VCUR Command is executed, Amplitude Track is turned off.

■ Query

Query syntax

VCUR?

RESPONSE MESSAGE

<cursor1>,<cursor2>

Parameter	Data Format
<cursor1>	NR3 NUMERIC RESPONSE DATA
<cursor2>	NR3 NUMERIC RESPONSE DATA

3.9.5. CMSR? / CMSR2? Query (Cursor measured value of Channel)

CMSR? / CMSR2? Query queries the Cursor measured value of the currently displayed Channel.

■ Query

Query syntax

CMSR?

CMSR2?

RESPONSE MESSAGE

<measure1>,<measure2>,<measure3>,<measure4>,<measure5>

,<measure6>,<measure7>,<measure8>,<measure9>,<measure10>

Parameter	Data Format
<measure1> to <measure10>	NR3 NUMERIC RESPONSE DATA

Remarks

When Automatic Measurement is not possible or Automatic Measurement is not enabled (when measurement is off), "+9.9100000E + 37" is acquired.

See the table below for detailed values.

	Cursor types	OFF	DH	DV	DHDV	VATH
CMSR? Query Response result	<mesure1>	9.9100000E+37	9.9100000E+37	CH1 ΔV	CH1 ΔV	CH1 V @t1
	<mesure2>	9.9100000E+37	9.9100000E+37	CH2 ΔV	CH2 ΔV	CH2 V@t1
	<mesure3>	9.9100000E+37	9.9100000E+37	CH3 ΔV	CH3 ΔV	CH3 V@t1
	<mesure4>	9.9100000E+37	9.9100000E+37	CH4 ΔV	CH4 ΔV	CH4 V@t1
	<mesure5>	9.9100000E+37	9.9100000E+37	CH5 ΔV	CH5 ΔV	CH5 V@t1
	<mesure6>	9.9100000E+37	9.9100000E+37	CH6 ΔV	CH6 ΔV	CH6 V@t1
	<mesure7>	9.9100000E+37	9.9100000E+37	CH7 ΔV	CH7 ΔV	CH7 V@t1
	<mesure8>	9.9100000E+37	9.9100000E+37	CH8 ΔV	CH8 ΔV	CH8 V@t1
	<mesure9>	9.9100000E+37	Δt	9.9100000E+37	Δt	t1
	<mesure10>	9.9100000E+37	1/Δt	9.9100000E+37	1/Δt	9.9100000E+37
CMSR2? Query Response result	<mesure1>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	CH1 V@t2
	<mesure2>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	CH2 V@t2
	<mesure3>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	CH3 V@t2
	<mesure4>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	CH4 V@t2
	<mesure5>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	CH5 V@t2
	<mesure6>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	CH6 V@t2
	<mesure7>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	CH7 V@t2
	<mesure8>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	CH8 V@t2
	<mesure9>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	t2
	<mesure10>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37

3.9.6. MMSR? / MMSR2? Query (MATH Cursor measured value)

MMSR? / MMSR2? Query queries the currently displayed MATH Cursor measured value.

- Query

Query syntax

MMSR?

MMSR2?

RESPONSE MESSAGE

<measure1>,<measure2>,<measure3>,<measure4>,<measure5>

,<measure6>,<measure7>,<measure8>,<measure9>,<measure10>

Parameter	Data Format
<measure1> to <measure10>	NR3 NUMERIC RESPONSE DATA

Remarks

When Automatic Measurement is not possible or Automatic Measurement is not enabled (when measurement is off), "+9.9100000E + 37" is acquired.

See the table below for detailed values.

	Cursor types	OFF	DH	DV	DHDV	VATH
MMSR1? Query Response result	<mesure1>	9.9100000E+37	9.9100000E+37	MATH1 ΔV	MATH1 ΔV	MATH1 ΔV@t1
	<mesure2>	9.9100000E+37	9.9100000E+37	MATH2 ΔV	MATH2 ΔV	MATH2 ΔV@t1
	<mesure3>	9.9100000E+37	9.9100000E+37	MATH3 ΔV	MATH3 ΔV	MATH3 ΔV@t1
	<mesure4>	9.9100000E+37	9.9100000E+37	MATH4 ΔV	MATH4 ΔV	MATH4 ΔV@t1
	<mesure5>	9.9100000E+37	9.9100000E+37	MATH5 ΔV	MATH5 ΔV	MATH5 ΔV@t1
	<mesure6>	9.9100000E+37	9.9100000E+37	MATH6 ΔV	MATH6 ΔV	MATH6 ΔV@t1
	<mesure7>	9.9100000E+37	9.9100000E+37	MATH7 ΔV	MATH7 ΔV	MATH7 ΔV@t1
	<mesure8>	9.9100000E+37	9.9100000E+37	MATH8 ΔV	MATH8 ΔV	MATH8 ΔV@1
	<mesure9>	9.9100000E+37	Δt	9.9100000E+37	Δt	t1
	<mesure10>	9.9100000E+37	1/Δt	9.9100000E+37	1/Δt	9.9100000E+37
MMSR2? Query Response result	<mesure1>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	MATH1 ΔV@t2
	<mesure2>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	MATH2 ΔV@t2
	<mesure3>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	MATH3 ΔV@t2
	<mesure4>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	MATH4 ΔV@t2
	<mesure5>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	MATH5 ΔV@t2
	<mesure6>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	MATH6 ΔV@t2
	<mesure7>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	MATH7 ΔV@t2
	<mesure8>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	MATH8 ΔV@t2
	<mesure9>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	t2
	<mesure10>	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37	9.9100000E+37

3.9.7. FFTHZ? Query (Cursor horizontal axis FFT frequency)

FFTHZ? Query queries the FFT frequency of the source horizontal axis set by CURS Command.

- Query

Query syntax

FFTHZ?

RESPONSE MESSAGE

<cursor1>,<cursor2>,<delta_cursor>

Parameter	Parameter Explanation	Data Format
<cursor1>	horizontal axis frequency of Cursor 1	NR3 NUMERIC RESPONSE DATA
<cursor2>	horizontal axis frequency of Cursor 2	NR3 NUMERIC RESPONSE DATA
<delta_cursor>	Difference between Cursor 1 and Cursor 2 frequencies	NR3 NUMERIC RESPONSE DATA

Remarks

- When CURM is DV (Cursor Type: Amplitude), <cursor1>, <cursor2>, and <delta_cursor> get "+9.9100000E + 37".
- When CURS has set Channel, <curso1>, <corsor2>, <delta_cursor> will get "+ 9.9100000E + 37".
- When Source Math set in CURS is other than FFT, <curso1>, <corsor2>, <delta_cursor> get "+9.9100000E + 37".

3.10. MEASURMENT GROUP

3.10.1. DIRM Command / Query (Automatic Measurement Measurement number)

DIRM command sets Measurement item A, B, C, D, E, F, G, H of Automatic Measurement.

DIRM? Query queries the current Automatic Measurement number.

■ Command

Command syntax

DIRM <dir>

<dir> :Measurement number of Automatic Measurement

Data Format	Setting
CHARACTER PROGRAM DATA	A, B, C, D, E, F, G, H

Remarks

When performing Automatic Measurement using the following Command / Query, it is necessary to set in advance with DIRM Command.

MSEL/MSEL?, SKLV/SKVL?, TPRM/TPRM?, GATE/GATE?, GATEPOS/GATEPOS?, MTR/MTR?、MSEB/MSEB?, PHASEP/PHASEP? and PHASEL/PHASEL?

■ Query

Query syntax

DIRM?

RESPONSE MESSAGE

<dir>

Parameter	Data Format
<dir>	CHARACTER RESPONSE DATA

3.10.2. MDSP Command / Query (Automatic Measurement ON / OFF)

MDSP Command sets Automatic Measurement ON / OFF.

MDSP? Query queries the current Automatic Measurement ON / OFF.

- Command

Command syntax

MDSP <function>

<function> : Automatic Measurement status

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

MDSP?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.10.3. STIC Command / Query (Automatic Measurement Statistical function)

STIC Command sets Automatic Measurement's Statistical function ON / OFF.

STIC? Query queries the current Automatic Measurement Statistical function ON / OFF.

■ Command

Command syntax

STIC <function>

<function> : Automatic Measurement Statistical function ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Example of use

Set the STIC function of Measure item [A] to ON

① DIRM A

② STIC ON

■ Query

Query syntax

STIC?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

Example of use

Get the ON / OFF status of the STIC function of Measure item [A]

① DIRM A

② STIC?

3.10.4. MSEB Command / Query (Enable Automatic Measurement)

MSEB Command sets the measurement function of the Automatic Measurement item set by DIRM Command ON / OFF.

MSEB? Query queries the measurement function ON / OFF of the Automatic Measurement item set in the current DIRM Command.

■ Command

Command syntax

MSEB <function>

<function> : Measurement enabled ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Remarks

Execute DIRMCommand to set the Automatic Measurement item, and then execute MSEB Command / Query.

Example of use

Enable Automatic Measurement for Measure item [A]

① DIRM A

② MSEB ON

■ Query

Query syntax

MSEB?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

Example of use

Get ON / OFF of Automatic Measurement of Measure item [A]

① DIRM A

② MSEB?

3.10.5. MSEL Command / Query (Automatic Measurement item)

MSEL Command sets Automatic Measurement.

MSEL? Query queries the settings of the Automatic Measurement item set in the current DIRM Command.

■ Command

Command syntax

MSEL <source>,<mode>

<source> : Channel for Automatic Measurement

Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<mode> : Measurement mode

Data Format	Setting
CHARACTER PROGRAM DATA	MAX, MIN, P-P, VRMS, CRMS, VMEAN, CVMEAN, TOP, BASE, T-B, +OSHOT, -OSHOT, TRTIME, FREQ, PERIOD, +PULSE, -PULSE, +WIDTH, -WIDTH, DUTY, AINTEGRAL, DVDT, INTEGRAL, +INTEGRAL, -INTEGRAL, SKEW, DELTAT[Note], PHASEP, PHASEL, TRLEVEL, TFLEVEL

Note: DELTA T stands for Skew (Level).

Remarks

- Execute DIRM Command to set the Automatic Measurement item, and then execute MSEL Command / Query.
- When the MESEL command is executed, the Type classification displayed in the Measure window is automatically changed to All.

Example of use

Set the Source of Automatic Measurement of Measure item [A] to CH1 and the measurement mode to MAX.

① DIRM A

② MSEL CH1,MAX

■ Query

Query syntax

MSEL?

RESPONSE MESSAGE

<source>,<mode>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<mode>	CHARACTER RESPONSE DATA

Example of use

Get the setting of Automatic Measurement of Measure item [A]

① DIRM A

② MSEL?

3.10.6. MTR Command / Query (Automatic Measurement Transition time and dv/dt measurement conditions)

MTR Command sets the transition time of Automatic Measurement and Parameter of dv/dt.

MTR? Query queries the transition time of the Automatic Measurement item and the Parameter of dv/dt set in the current DIRM Command.

- Command

Command syntax

MTR <source>,<slope>,<level1>,<level2>,<mean>

<source> : Channel for Automatic Measurement

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<slope> : Waveform rise and fall

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<level1> : Start point of waveform measurement

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	10 to 89

<level2> : End point of waveform measurement

Format	Setting
DECIMAL NUMERIC PROGRAM DATA	11 to 90

<mean> : Measurement reference

Data Format	Setting
CHARACTER PROGRAM DATA	PEAK, BASE

Remarks

The value of <level2> is set in preference to the value of <level1>.

Exsample)

MTR CH1, FALL, 49,60, PEAK

Then, what is actually set is

MTR CH1, FALL, 61,60, PEAK

It will be.

Example of use

Set MeasureType dv/dt of Measure item [A]

① DIRM A

② MSEL CH1,DVDT

③ MTR CH1,RISE,50,60,PEAK

■ Query

Query syntax

MTR?

RESPONSE MESSAGE

<source>,<slope>,<level1>,<level2>,<mean>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA
<slope>	CHARACTER RESPONSE DATA
<level1>	NR1 NUMERIC RESPONSE DATA
<level2>	NR1 NUMERIC RESPONSE DATA
<mean>	CHARACTER RESPONSE DATA

Example of use

Get Measure Type dv/dt setting for Measure item [A]

① DIRM A

② MSEL CH1,DVDT

③ MTR?

3.10.7. SKLV Command / Query (Conditions of Automatic Measurement SKEW)

SKLV Command sets Automatic Measurement SKEW condition.

SKVL? Query acquires the SKEW measurement condition of the Automatic Measurement item set by the current DIRM Command.

- Command

Command syntax

SKLV <from_source>,<level1>,<slope1>,<to_source>,<level2>,<slope2>,<mean>

<from_source> : From Source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<level1>: Level1 value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	10 to 90

<slope1>: Slope1 slope

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<to_source>: To Source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<level2>: Level2 value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	10 to 90

<slope2>: Slope2 slope

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<mean>: Measurement standard

Data Format	Setting
CHARACTER PROGRAM DATA	PEAK, BASE

Remarks

Execute DIRM Command to set the Automatic Measurement item, and then execute SKEW Command / Query.

Example of use

Set Measure Type SKEW (%) for Measure item [A]

① DIRM A

② MSEL CH1,SKEW

③ SKLV 20,RISE,CH2,30,RISE,PEAK

■ Query

Query syntax

SKLV?

RESPONSE MESSAGE

<from_source>,<level1>,<slope1>,<to_source>,<level2>, <slope2>,<mean>

Parameter	Data Format
<from_source>	CHARACTER RESPONSE DATA
<level1>	NR1 NUMERIC RESPONSE DATA
<slope1>	CHARACTER RESPONSE DATA
<to_source>	CHARACTER RESPONSE DATA
<level2>	NR1 NUMERIC RESPONSE DATA
<slope2>	CHARACTER RESPONSE DATA
<mean>	CHARACTER RESPONSE DATA

Example of use

Acquisition of Setting of Measure Type SKEW (%) of Measure item [A]

① DIRM A

② MSEL CH1,SKEW

③ SKLV?

3.10.8. TPRM Command / Query (Conditions for Automatic Measurement DELTA)

TPRM Command sets the measurement conditions for Automatic Measurement SKEW.

TPRM? Query queries the measurement condition of Skew (Level) of the Automatic Measurement item set by the current DIRM Command.

■ Command

Command syntax

TPRM <from_source>,<from_level>,<from_edge>,<to_source>,<to_level>,<to_edge>

<from_source>: From Source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<from_level>: From Source Level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5div to +5div

<from_edge>: From Source edge

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<to_source>: To Source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<to_level >: To Source Level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5 div to +5 div

<to_edge >: To Source edge

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

Example of use

Set the Measure Type SKEW (Level) of Measure item [A]

① DIRM A

② MSEL CH1,DELTAT

③ TPRM CH1,+200mV,RISE,CH2,+400mV,RISE

■ Query

Query syntax

TPRM?

RESPONSE MESSAGE

<from_source>,<from_level>,<from_edge>,<to_source>,<to_level>,<to_edge>

Parameter	Data Format
<from_source>	CHARACTER RESPONSE DATA
<from_level>	NR3 NUMERIC RESPONSE DATA
<from_edge>	CHARACTER RESPONSE DATA
<to_source>	CHARACTER RESPONSE DATA
<to_level>	NR1 NUMERIC RESPONSE DATA
<to_edge>	CHARACTER RESPONSE DATA

Example of use

Get the Setting of Measure Type SKEW (Level) of Measure item [A]

① DIRM A

② MSEL CH1,DELTAT

③ TPRM?

3.10.9. MSRA? - MSRH? Query (Query results from Automatic Measurement)

MSRA? / MSRB? / MSRC? / MSRD? / MSRE? / MSRF? / MSRG? / MSRH? Query queries the result of Automatic Measurement A, B, C, D, E, F, G, H.

■ Query

Query syntax

MSRA? (MSRB?, MSRC?, MSRD?, MSRE, MSRF?, MSRG?, MSRH?)

RESPONSE MESSAGE

<value>, <maximum_value>,

<minimum_value>,<mean_value>,<stddev_value>,<measure_number>

Parameter	Data Format
<value>	NR3 NUMERIC RESPONSE DATA
<maximum_value >	NR3 NUMERIC RESPONSE DATA
<minimum_value>	NR3 NUMERIC RESPONSE DATA
<mean_value>	NR3 NUMERIC RESPONSE DATA
<stddev_value>	NR3 NUMERIC RESPONSE DATA
<measure_number>	NR3 NUMERIC RESPONSE DATA

Remarks

- When Automatic Measurement is not possible or Automatic Measurement is not enabled (when measurement is off), "+9.9100000E + 37" is acquired.
- When Statistical function is off, values other than <value> get "+9.9100000E + 37".

3.10.10. GATE Command / Query (Measurement range function of Automatic Measurement)

GATE Command sets whether to turn ON / OFF the measurement range function of Automatic Measurement.

GATE? Query queries the measurement range function of the Automatic Measurement item set in the current DIRM ON / OFF.

■ Command

Command syntax

GATE <function>

<function> : he measurement range function of Automatic Measurement

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Example of use

Turn on the Gate function of Measure item [A]

① DIRM A

② GATE ON

■ Query

Query syntax

GATE?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

Example of use

Get ON / OFF of Gate function of Measure item [A]

① DIRM A

② GATE?

3.10.11. GATEPOS Command / Query (Measurement range of Automatic Measurement)

GATEPOS Command sets the measurement range of Automatic Measurement.

GATEPOS? Query queries the measurement range of the Automatic Measurement item set by the current DIRM Command.

■ Command

Command syntax

GATEPOS <gate1>, <gate2>

<gate1>: gate 1

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6div to +6div

<gate2>: gate 2

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6div to +6div

Remarks

Please set <gate1>,<gate2> with div.

Example of use

Set the measurement range of Gate in Measure item [A]

① DIRM A

② GATEPOS -3,+3

■ Query

Query syntax

GATEPOS?

RESPONSE MESSAGE

<gate1>,<gate2>

Parameter	Data Format
<gate1>	NR3 NUMERIC RESPONSE DATA
<gate2>	NR3 NUMERIC RESPONSE DATA

Example of use

· Get the measurement range of Gate of Measure item [A]

① DIRM A

② GATEPOS ?

3.10.12. PHLV Command / Query(Automatic measurement PHASEP measurement conditions)

PHLV Command sets the measurement conditions for automatic measurement PHASEP.

The PHLV? Query gets the PHASEP measurement condition of the automatic measurement item set by DIRM Command.

■ Command

Command syntax

PHLV <source1>,<slope1>,<level1>,<source2>,<slope2>,<level2>,<unit>,<mean>

<source1> : Source1

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108/8058/8038) {CH1, CH2, CH3, CH4} (DS-8104/8054/8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} For all models)

<slope1> : Source1 slope

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<level1> : Level1 value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	10～90

<source2> : Source2

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108/8058/8038) {CH1, CH2, CH3, CH4} (DS-8104/8054/8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<slope2> : Source2 slope

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<level2> : Level2 value

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	10～90

<unit> : Unit of measurement result

Data Format	Setting
CHARACTER PROGRAM DATA	DEG, RAD, PCE

<mean> : Measurement standard

Data Format	Setting
CHARACTER PROGRAM DATA	PEAK, BASE

Remarks

- Execute DIRM Command to set the automatic measurement items, and then execute PHLV Command / Query.
- If the MSEL Command of the automatic measurement item is not PHASEP and the PHLV Command is executed, a device-specific error (DDE) will occur.

Example of use

Measure item [A] Measure type Phase (%) setting

① DIRM A

② MSEL CH1,PHASEP

③ PHLV CH1,RISE,20,CH2,RISE,30,PEC,PEAK

■ Query

PHLV?

RESPONSE MESSAGE

<source1>,<slope1>,<level1>,<source2>,<slope2>,<level2>,<unit>,<mean>

Parameter	Data Format
<source1>	CHARACTER RESPONSE DATA
<slope1>	CHARACTER RESPONSE DATA
<level1>	NR1 NUMERIC RESPONSE DATA
<source2>	CHARACTER RESPONSE DATA
<slope2>	CHARACTER RESPONSE DATA
<level2>	NR1 NUMERIC RESPONSE DATA
<unit>	CHARACTER RESPONSE DATA
<mean>	CHARACTER RESPONSE DATA

Example of use

Gets the set value of Measure type Phase (%) of Measure item [A]

① DIRM A

② MSEL CH1,PHASEP

③ PHLV?

3.10.13. PPRM Command / Query (Automatic measurement PHASEL measurement conditions)

PPRM Command sets the measurement conditions for automatic measurement PHASEL.

The PPRM? Query gets the PHASEL measurement condition of the automatic measurement item set in the current DIRM Command.

■ Command

Command syntax

PPRM <source1>,<slope1>,<level1>,<source2>,<slope2>,<level2>,<unit>

<source1> : Source1

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108/8058/8038) {CH1, CH2, CH3, CH4} (DS-8104/8054/8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<slope1> : Source1 slope

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<level1> : Source1 level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5div～+5div

<source2> : Source2

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108/8058/8038) {CH1, CH2, CH3, CH4} (DS-8104/8054/8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<slope2> : Source2 slope

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<level2> : Source2 level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5div～+5div

<unit> : Unit of measurement result

Data Format	Setting
CHARACTER PROGRAM DATA	DEG, RAD, PCE

Example of use

Measure item [A] Measure type Phase (Level) setting

① DIRM A

② MSEL CH1,PHASEL

③ PPRM CH1,RISE,+200mV,CH2,RISE,+400mV,PCE

■ Query

Query syntax

PPRM?

RESPONSE MESSAGE

<source1>,<slope1>,<level1>,<source2>,<slope2>,<level2>,<unit>

Parameter	Data Format
<source1>	CHARACTER RESPONSE DATA
<slope1>	CHARACTER RESPONSE DATA
<level1>	NR3 NUMERIC RESPONSE DATA
<source2>	CHARACTER RESPONSE DATA
<slope2>	CHARACTER RESPONSE DATA
<level2>	NR3 NUMERIC RESPONSE DATA
<unit>	CHARACTER RESPONSE DATA

Example of use

Gets of Measure type Phase (Level) setting value of Measure item [A]

① DIRM A

② MSEL CH1,PHASEL

③ PPRM?

3.10.14. TRFLV Command / Query (Measurement conditions for automatic measurement TRLEVEL and TFLEVEL)

The TRFLV Command sets the measurement conditions for automatic measurement TRLELVEL and TFLEVEL.

The TRFLV? Query retrieves the measurement conditions for the automatic measurements TRLELVEL and TFLEVEL.

■ Command

Command syntax

TRFLV <src>,<level1>,<level2>

<src> : Source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034) {MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (For all models)

<level1> : level1

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5div～+5div

<level2> : level2

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5div～+5div

Remarks

- Execute the DIRM Command to set up the automatic measurement items and then execute the TRFLV Command / Query.
- If the MSEL Command is TRLEVEL, level1 <level2 always.
- If the MSEL Command is TFLEVEL, it is always level1 > level2.

examples showing the use (of a word)

Measure type TRLEVEL setting for Measure item [A

① DIRM A

② MSEL CH1,TRLEVEL

③ TRFLV CH1,+200mV,+400mV

■ Query

Query syntax

TRFLV?

RESPONSE MESSAGE

<src>,<level1>,<level2>

Parameter	Data Format
<src>	CHARACTER RESPONSE DATA
<level1>	NR3 NUMERIC RESPONSE DATA
<level2>	NR3 NUMERIC RESPONSE DATA

examples showing the use (of a word)

Obtaining the set value of Measure type TFLEVEL for Measure item [A

① DIRM A

② MSEL CH1,TFLEVEL

③ TRFLV?

3.11. PASS/FAIL GROUP

3.11.1. PFACT Command / Query (Conditions for events to be performed in pass/fail decisions)

PFACT Command sets the event to be executed in response to a pass/fail result.

PFACT? Query retrieves settings for events to be executed based on pass/fail results.

■ Command

Command syntax

PFACT <stop>,<copy>,<wave>,<setup>,<pulse>,<beep>

<stop> : Waveform acquisition event

Format	Setting
CHARACTER PROGRAM DATA	NONE, PASS, FAIL NONE : Nothing. PASS : Stop waveform acquisition when the pass/fail result is pass. FAIL : Stop waveform acquisition when the pass/fail result is fail.

<copy> : Screen save event

Format	Setting
CHARACTER PROGRAM DATA	NONE, PASS, FAIL, ANY NONE : Nothing. PASS : Save the screen if the pass/fail result is pass.. FAIL : Saves the screen if the pass/fail result is a fail. ANY : Saves the screen whether the pass/fail result is pass or fail.

<wave> : waveform saving event

Format	Setting
CHARACTER PROGRAM DATA	NONE, PASS, FAIL, ANY NONE : Nothing. PASS : Save the waveform if the pass/fail result is pass. FAIL : Saves the screen if the pass/fail result is a fail. ANY : Saves the waveform whether the pass/fail result is pass or fail.

<setup> : setup save event

Format	Setting
CHARACTER PROGRAM DATA	NONE, PASS, FAIL, ANY NONE : Nothing. PASS : Saves the setup file if the pass/fail result is pass. FAIL : Saves the setup file if the pass/fail result is a fail. ANY : Saves the setup file whether the pass/fail result is pass or fail.

<pulse> : Pulse output event

Format	Setting
CHARACTER PROGRAM DATA	NONE, PASS, FAIL, ANY NONE : Nothing. PASS : Pulse is output from the AUX OUT on the side panel when the pass/fail result is pass. FAIL : Pulse is output from the AUX OUT on the side panel when the pass/fail result is fail. ANY : Pulses are output from the AUX OUT on the side panel regardless of whether the pass/fail result is pass or fail.

<beep> : beep sound event

Format	Setting
CHARACTER PROGRAM DATA	NONE, PASS, FAIL, ANY NONE : Nothing. PASS : Beeps when the pass/fail result is pass. FAIL : Beeps if the pass/fail result is a fail. ANY : Beeps whether the pass/fail result is pass or fail.

■ Query

Query syntax

PFACT?

RESPONSE MESSAGE

<stop>,<copy>,<wave>,<setup>,<pulse>,<beep

Parameter	Format
<stop>	CHARACTER RESPONSE DATA
<copy>	CHARACTER RESPONSE DATA
<wave>	CHARACTER RESPONSE DATA
<setup>	CHARACTER RESPONSE DATA
<pulse>	CHARACTER RESPONSE DATA
<beep>	CHARACTER RESPONSE DATA

3.11.2. PFMESA - PFMESH Command / Query (Pass/fail conditions for automatic measurement A, B, C, D, E, F, G, H)

PFMESA, PFMESB, PFMESC, PFMESD, PFMESE, PFMESF, PFMESG, and PFMESH Commands set the judgment conditions for automatic measurement A, B, C, D, E, F, G, and H when pass/fail judgment is made for automatic measurement, respectively.

PFMESA?, PFMESB?, PFMESC?, PFMESD?, PFMESE?, PFMESF?, PFMESG?, PFMESH? Query retrieves the decision conditions for automatic measurements A, B, C, D, E, F and G when pass/fail decisions are made for each automatic measurement.

■ Command

Command syntax

PFMESA (or PFMESB, PFMESC, PFMESD, PFMESE, PFMESF, PFMESG, PFMESH) <condition >,<m>,<n>

<passif> : pass/fail condition

Format	Setting
CHARACTER PROGRAM DATA	NONE, M_V, V_M, M_V_N, V_M_N_V NONE : The judgment result is always pass regardless of the result of automatic measurement A (or B, C, D, E, F, G, H). M_V : Judgment result is pass if the result v of automatic measurement A (or B, C, D, E, F, G, H) is m≤v. V_M : Judgment result is pass if v is v≤m as a result of automatic measurement A (or B, C, D, E, F, G, H). M_V_N : Judgment result is pass if result v of automatic measurement A (or B, C, D, E, F, G, H) is m≤v≤n. V_M_N_V : Judgment result will be pass if the result v of automatic measurement A (or B, C, D, E, F, G, H) is v≤m or n≤v.

<m> : m for pass/fail condition

Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-999.0T to +999.0T

<n> : n of pass/fail criteria

Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-999.0T to +999.0T

Remarks

- The response to the PFRSLT?Query will be PASS only if the result of all the determinations of automatic measurement A (or B, C, D, E, F, G, H) is PASS.
- If <condition> is set to M_V_N,V_M_N_V in the PFMESA (or PFMESB, PFMESC, PFMESD, PFMESE, PFMESF, PFMESG, PFMESH) Command, <m> is <n> less than value rounded to the value less than <n> .

■ Query

Query syntax

PFMESA?(or PFMESB?, PFMESC?, PFMESD?, PFMESE?, PFMESF?, PFMESG?, PFMESH?)

RESPONSE MESSAGE

<condition >,<m>,<n>

Parameter	Format
<condition>	CHARACTER RESPONSE DATA
<m>	NR3 NUMERIC RESPONSE DATA
<n>	NR3 NUMERIC RESPONSE DATA

3.11.3. PFOPE Command / Query (Pass/fail on/off)

PFOPE Command sets whether a pass/fail decision is performed.

PFOPE? Query retrieves whether a pass/fail decision should be performed.

■ Command

Command syntax

PROPE <operation>.

<operation> : Execute pass/fail decision

Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

■ Query

Query syntax

PFOPE?

RESPONSE MESSAGE

<operation>

Parameter	Format
<operation>	CHARACTER RESPONSE DATA

3.11.4. PFPIF Command / Query (Conditions for pass/fail results)

PFPIF Command sets the conditions under which the pass/fail result will be passed.

PFPIF? Query retrieves the conditions under which the pass/fail result is a pass.

- Command

Command syntax

PFPIF <passif>.

<passif> : Condition for pass/fail result

Format	Setting
CHARACTER PROGRAM DATA	ALLTRUE, ALLFALSE , ANYTRUE, ANYFALSE ALLTRUE : Passes when all measurement judgment results are true. ALLFALSE : Passes if all the results of the measurement are false. ANYTRUE : Passes if the result of the measurement decision is true. ANYFALSE : Passes if the result of the measurement is false.

- Query

Query syntax

PFPIF?

RESPONSE MESSAGE

<passif>

Parameter	Format
<passif>	CHARACTER RESPONSE DATA

3.11.5. PFRSLT? Query (Get pass/fail results at)

PFRSLT? Query retrieves the pass/fail results.

■ Query

Query syntax

PFRSLT?

<result> : result of pass/fail judgment

Format	Setting
CHARACTER PROGRAM DATA	NONE, PASS, FAIL

RESPONSE MESSAGE

<result>

Parameter	Format
<result>	CHARACTER RESPONSE DATA

3.11.6. PFCNT? Query (To obtain the number of pass/fail results)

PFCNT? Query retrieves the number of times the pass/fail decision resulted in a pass or fail, respectively.

■ Query

Query syntax

PFCNT?

RESPONSE MESSAGE

<pass>,<fail>

Parameter	Format
<pass>	NR1 NUMERIC RESPONSE DATA
<fail>	NR1 NUMERIC RESPONSE DATA

3.11.7. AUXOUT Command / Query (AUX OUT terminal output setting)

AUXOUT Command sets the output contents of the AUX OUT terminal.

AUXOUT? Query retrieves the output contents of the AUX OUT terminal.

■ Command

Command syntax

AUXOUT <auxout>

<auxout> : Output contents of AUX OUT terminal

Format	Setting
character program data	TRIGGER, PASSFAIL · TRIGGER The output of the AUX OUT terminal is used for triggering. · PASSFAIL The output from the AUX OUT terminal is used for pass/fail judgment.

Remarks

If the AUXOUT Command is executed when the external trigger (DS-601) option is installed, a device-specific error (DDE) occurs.

■ Query

Query syntax

AUXOUT?

RESPONSE MESSAGE

<auxout>

Parameter	Format
<auxout>	CHARACTER RESPONSE DATA

Remarks

When the external trigger (DS-601) option is installed, "NONE" is responded to the AUXOUT? Query.

3.12. SEARCH GROUP

3.12.1. SEARCH Command / Query (Search function ON / OFF)

The SEARCH command sets the search function ON / OFF.

SEARCH? Query queries the current search function ON / OFF.

- Command

  Command syntax

  SEARCH <function>

  <function>: Search function ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

  Query syntax

  SEARCH?

  RESPONSE MESSAGE

  <function>

Parameter	Data Format
<function>	RESPONSE MESSAGE

3.12.2. SLIST Command / Query (Display Search list table)

The SLIST command sets the display of the Search list on and off.

The SLIST? Query queries the display status of the current Search list.

- Command

Command syntax

SLIST <function>

<function>:Search list ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

Query syntax

SLIST?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	RESPONSE MESSAGE

3.12.3. SMARK Command / Query (Display Search markers)

The SMARK Command sets the display of Search markers ON/ OFF.

The SMARK? Query queries the display of the current Search marker ON/ OFF.

- Command

  Command syntax

  SMARK <function>

  <function>:Search marker ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

- Query

  Query syntax

  SMARK?

  RESPONSE MESSAGE

  <function>

Parameter	Data Format
<function>	RESPONSE MESSAGE

3.12.4. SSRC Command / Query (Search source channel)

The SSRC Command sets the Search source channel.

The SSRC? Query queries the current Search source channel.

- Command

  Command syntax

  SSRC <source>

  <source>:Search source channel

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4} (DS-8104 / 8054 / 8034)

- Query

  Query syntax

  SSRC?

  RESPONSE MESSAGE

  <source>

Parameter	Data Format
<source>	RESPONSE MESSAGE

3.12.5. STYP Command / Query (Search Type)

The STYP Command sets the search type.

The STYP? Query queries the current Search search type.

- Command

  Command syntax

  STYP <type>

  <type>:Search Type

Data Format	Setting
CHARACTER PROGRAM DATA	EDGE, CRMS, CVMEAN, FREQ, PERIOD, WIDTH, DUTY, TRTIME

- Query

  Query syntax

  STYP?

  RESPONSE MESSAGE

  <type>

Parameter	Data Format
<type>	RESPONSE MESSAGE

3.12.6. SEDGE Command / Query (Edge search conditions)

The SEDGE Command sets the EDGE type of Search.

The SEDGE? Query queries the current Search EDGE type setting.

- Command

Command syntax

SEDGE <slope>,<level>,<hysteresis>

<slope>:Edge slope

Data Format	Setting
CHARACTER PROGRAM DATA	POS, NEG

<level>: Edge level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-6div to +6div

<hysteresis>: Edge hysteresis

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0.1div to 2.0div

Remarks

When the STYP command is not EDGE, executing the SEDGE command will result in a device-specific error (DDE).

- Query

Query syntax

SEDGE?

RESPONSE MESSAGE

<slope>,<level>,<hysteresis>

Parameter	Data Format
<slope>	RESPONSE MESSAGE
<level>	NR3 NUMERIC RESPONSE DATA
<hysteresis>	NR3 NUMERIC RESPONSE DATA

3.12.7. SCOND Command / Query (Search condition setting)

The SCOND Command sets the search conditions for the STYP command to be CRMS, CVMEAN, FREQ, PERIOD, WIDTH, DUTY, TRTIME.

The SECOND? Query queries the current search condition.

- Command

  Command syntax

  SCOND <condition>,<m>,<n>

  <condition>:Search conditions

Data Format	Setting
CHARACTER PROGRAM DATA	{ANY, M_V, V_M, M_V_N, V_M_N_V}

  <m>: Search condition m

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	The values that can be set differ depending on the Search type. · CRMS:{0V to 999TV (Resolution: 1pV)} · CVMEAN:{-999TV to 999TV (Resolution: 1pV)} · FREQ:{0Hz to 100GHz (Resolution:1μHz)} · WIDTH:{0s to 600s (Resolution: 1ps)} · PERIOD:{0s~600s(Resolution: 1ps)} · DUTY:{0% to 100% (Resolution:0.001%)} · TRTIME:{0s to 600s (Resolution: 1ps)}

  <n>: Search condition n

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	It is the same configurable value as <m>.

Remarks

- When the STYP command is EDGE and the SCOND command is executed, a device-specific error (DDE) will occur.
- <n> is always greater than <m>.

■ Query

Query syntax

SCOND?

RESPONSE MESSAGE

<condition>,<m>,<n>

Parameter	Data Format
<condition>	RESPONSE MESSAGE
<m>	NR3 NUMERIC RESPONSE DATA
<n>	NR3 NUMERIC RESPONSE DATA

3.12.8. STR Command / Query (Transition time search conditions)

The STYP Command sets TRTIME for the STR command.

The STR? Query queries the current TRTIME search conditions.

■ Command

Command syntax

STR <slope>,<level1>,<level2>,<mean>

<slope>: Waveform rise and fall

Data Format	Setting
CHARACTER PROGRAM DATA	RISE, FALL

<level1>: Waveform measurement start level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	The values that can be set differ depending on the <slope> setting condition. ・ RISE:{10 to 89} ・ FALL:{11 to 90}

<level2>: Waveform measurement end level

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	The values that can be set differ depending on the <slope> setting condition. ・ RISE:{11 to 90} ・ FALL:{10 to 89}

<mean>: Measurement reference level

Data Format	Setting
CHARACTER PROGRAM DATA	PEAK, BASE

Remarks

Executing the STR command when the STYP command is not TRTIME will result in a device-specific error (DDE).

■ Query

Query syntax

STR?

RESPONSE MESSAGE

<slope>,<level1>,<level2>,<mean>

Parameter	Data Format
<slope>	RESPONSE MESSAGE
<level1>	NR3NUMERIC RESPONSE DATA
<level2>	NR3NUMERIC RESPONSE DATA
<mean>	RESPONSE MESSAGE

3.12.9. SWTM Command / Query (Pulse width search conditions)

The SWTM Command sets the polarity criteria for pulse width searches.

The SWTM? Query queries the polarity conditions for the current pulse width search.

- Command

  Command syntax

  SWTM <polarity>

  <polarity>: polarity

Data Format	Setting
CHARACTER PROGRAM DATA	POS, NEG

Remarks

Executing the SWTM command when the STYP command is not WIDTH results in a device-specific error (DDE).

- Quey

  Query syntax

  SWTM?

  RESPONSE MESSAGE

  <polarity>

Parameter	Data Format
<polarity>	RESPONSE MESSAGE

3.12.10. STOTAL? Quey (Total index count in Search list)

The STOTAL? Query queries the total number of indexes in the current Search list.

- Query

  Query syntax

  STOTAL?

  RESPONSE MESSAGE

  <total>

Parameter	Data Format
<total>	NR1 NUMERIC RESPONSE DATA

Remarks

When there is no search result in the Search list, "+0000000" is acquired.

3.12.11. SVALUE? Quey (Get search results)

The SVALUE? Query queries the search results for the specified index number.

- Query

  Query syntax

  SVALUE? <index>

  <index>: Search result index number

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	1 to 40000

RESPONSE MESSAGE

<time>,<value>

Parameter	Data Format
<time>	NR3 NUMERIC RESPONSE DATA
<value>	NR3 NUMERIC RESPONSE DATA

Remarks

- When there is no search result in the Search list, both <time> and <value> will get "+9.9100000E + 37".
- When the Search type is EDGE, <value> gets "+9.9100000E + 37".
- When <index> exceeds the total number of indexes, get the search results for the maximum index number.

3.13. HISTORY GROUP

3.13.1. HIST Command / Query (History function ON / OFF)

HIST Command sets History function ON / OFF.

HIST? Query queries the current history function ON / OFF.

■ Command

Command syntax

HIST <function>

<function>: History function ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

■ Query

Query syntax

HIST?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

3.13.2. PGHIST Command / Query (History page settings)

PGHIST Command sets History page number.

PGHIST? Query queries the current history page number.

- Command

Command syntax

PGHIST <page>

<page>: History page

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	1 to 32768

- Query

Query syntax

PGHIST?

RESPONSE MESSAGE

<page>

Parameter	Data Format
<page>	NR1 NUMERIC RESPONSE DATA

3.13.3. PGTOTAL? Query (Total number of histories)

PGTOTAL? Query queries the current total number of histories.

■ Query

Query syntax

PGTOTAL?

RESPONSE MESSAGE

<total> : Total number of histories

Parameter	Data Format
<total>	NR1 NUMERIC RESPONSE DATA

3.14. SAVE/RECALL GROUP

3.14.1. SFSTP Command (Save setup data)

SFSTP Command saves the setup data to the internal memory or USB memory.

■ Command

Command syntax

SFSTP <wave>,<file>

<wave> : Waveform data storage ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<file> : File path you want to save

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

Remarks

Some characters cannot be used in <file>. The following characters cannot be used.

¥:*?”<>|

Using these characters will result in a Command error (CME). However, double coating (“)” can only be used by enclosing the <file> string.

Example of use

Save the setup data with waveform data to a USB memory with the name "Setup1.set".

SFSTP ON,”USB/Setup1.set”

The setup data without waveform data under the directory FileA in the internal memory as "Setup2.set"

SFSTP OFF,”INMEM/FileA/Setup2.set”

3.14.2. RFSTP Command (Call setup data)

RFSTP Command calls the setup data stored in the internal memory or USB memory.

■ Command

Command syntax

RFSTP <file>

<file>: File path you want to call

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

Remarks

- <file> may not have some characters. The following characters cannot be used.

  ¥:*?”<>|

  Using these characters will result in a Command error (CME). However, double coating (“)” can only be used by enclosing the <file> string.
- When the file does not exist, a Command error (CME) will occur.

Example of use

- Call "Setup1.set" that stores the setup data in the USB memory.

  RFSTP ”USB/Setup1.set”.
- Call "Setup2.set" which stores the setup data under the directory FileA in the internal. memory.

  RFSTP ”INMEM/FileA/Setup2.set”

3.14.3. RFWFM Command (Call for waveform only)

RFWFM Command recalls only waveforms from files stored in the internal storage or USB memory.

■ Command

Command syntax

RFWFM <file>.

<file>: File path you want to call

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

Remarks

- <file> may not have some characters. The following characters cannot be used.

  ¥:*?”<>|

  Using these characters will result in a Command error (CME). However, double coating (“)” can only be used by enclosing the <file> string.
- When the file does not exist, a Command error (CME) will occur.

3.14.4. FWASCI Command (Save ASCII waveform data of CH waveform)

FWASCI Command saves ASCII waveform data in the internal memory or USB memory.

■ Command

Command syntax

FWASCI <file>,<header>,<delimiter>,<time>,<time_digits>,<center0s>

<file> : File path of save destination

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

<header> : ON / OFF of header information of waveform information

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<delimiter> : Waveform data delimiter

Data Format	Setting
CHARACTER PROGRAM DATA	COMMA, SPACE, TAB

<time> : ON / OFF of horizontal axis data of waveform

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<time_digits> : Number of digits in time data

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	6～15

<center0s > : On / off for the screen center of the saved waveform

Data Format	Setting

CHARACTER PROGRAM DATA	ON, OFF

Remarks

- <file> may not have some characters. The following characters cannot be used.

  ¥:*?”<>|

  Using these characters will result in a command error (CME). However, double coating (“)” can only be used by enclosing the <file> string.
- If <time> is OFF, the parameters of <time_digits> and <center0s> are ignored.

Example of use

- Save ASCII waveform data (<header> = ON, <delimiter> = COMMA, <time> = ON, <time_digits> = 15, <center0s> = ON) to a USB memory with the name "wave1.csv".

  FWASCI “USB/wave1.csv”,ON,COMMA,ON,15,ON

- Save ASCII waveform data (<header> = OFF, <delimiter> = TAB, <time> = OFF, <time_digits> = 6, <center0s> = OFF) in the internal storage folder FileA with the name "wave2.csv".

  FWASCI “INMEM/FileA/wave2.csv”,OFF,TAB,OFF,6,OFF

3.14.5. FWMATH Command (Save ASCII waveform data of MATH waveform)

FWMATH Command saves the ASCII waveform data of the MATH waveform to internal memory or USB memory.

■ Command

Command syntax

FWMATH <file>,<src>,<header>,<delimiter>,<time> ,<time_digits>,<center0s>

<file> : File path of save destination

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

<src> : Math source to save

Data Format	Setting
CHARACTER PROGRAM DATA	MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8

<header> : ON / OFF of header information of waveform information

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<delimiter> : Waveform data delimiter

Data Format	Setting
CHARACTER PROGRAM DATA	COMMA, SPACE, TAB

<time> : ON / OFF of horizontal axis data of waveform

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<time_digits> : Number of digits in time(frequency) data

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	6～15

<center0s > : On / off for the screen center of the saved waveform

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Remarks

- <file> may not have some characters. The following characters cannot be used.

  ¥:*?"<>|

  Using these characters will result in a command error (CME). However, double coating (“)” can only be used by enclosing the <file> string.
- If <time> is OFF, the parameters of <time_digits> and <center0s> are ignored.

Example of use

- Save ASCII waveform data (<header> = ON, <delimiter> = COMMA, <time> = ON, <time_digits> = 15, <center0s> = ON) to a USB memory with the name "wave1.csv".

  FWASCI “USB/wave1.csv”,ON,COMMA,ON,15,ON

- Save ASCII waveform data (<header> = OFF, <delimiter> = TAB, <time> = OFF, <time_digits> = 6, <center0s> = OFF) in the internal storage folder FileA with the name "wave2.csv".

  FWASCI “INMEM/FileA/wave2.csv”,OFF,TAB,OFF,6,OFF

3.14.6. FWBIN Command (Saving Binary waveform data)

FWBIN Command saves Binary waveform data in the internal memory or USB memory.

■ Command

Command syntax

FWBIN <file>,<format>

<file> : File path of save destination

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

<format> : Waveform Data Format

Data Format	Setting
CHARACTER PROGRAM DATA	BYTE, WORD

Remarks

・ <file> may not have some characters. The following characters cannot be used.

¥:*?”<>|

Using these characters will result in a Command error (CME). However, double coating (“)” can only be used by enclosing the <file> string.

Example of use

Save Binary waveform data (<Data Format> = BYTE) to a USB memory with the name "wave1.bin"

FWBIN ”USB/wave1.biHn”,BYTE

Save Binary waveform data (<format> = WORD) in the internal memory directory FileA with the name "wave2.bin".

FWBIN ”INMEM/FileA/wave2.bin”,WORD

3.14.7. COPY Command (Hard copy)

COPY Command saves the current screen data to USB memory or internal memory.

■ Command

Command syntax

COPY <file>,<transparency>,<scheme>

<file> : File path of save destination

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

<transparency> : Screen data transparency ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<scheme> : Screen data color scheme

Data Format	Setting
CHARACTER PROGRAM DATA	SCHEME1, SCHEME2, SCHEME3

Remarks

<file> may not have some characters. The following characters cannot be used.

¥:*?”<>|

Using these characters will result in a Command error (CME).

Example of use

- Save the screen data (<transparency> = ON, <scheme> = SCHEME1) to the USB memory with the name "display1.png"

  COPY ”USB/display1.png”,ON,SCHEME1

- Save the screen data (<transparency> = OFF, <scheme> = SCHEME2) in the internal memory

directory FileA with the name "display2.png".

COPY ”INMEM/FileA/display2.png”,OFF,SCHEME2

3.14.8. FILE? Query (File search)

FILE? Query queries a list of files in the specified directory.

■ Query

Query syntax

FILE? <dir>

<dir> : Directory path to search

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

Remarks

- Some characters cannot be used in <dir>. The following characters cannot be used.

  ¥:*?”<>|

  Using these characters will result in a Command error (CME). However, double coating (“)” can only be used by enclosing the <dir> string.
- When the file does not exist in the searched directory path, the response cannot be obtained.

RESPONSE MESSAGE

<files>

Parameter	Data Format
<files>	CHARACTER RESPONSE DATA

Example of use

- Search for files in the USB memory directory FileS (Suppose FileA has "testA.set" and "testB.bin".)

  FILE? ”USB/FileA

RESPONSE MESSAGE

"USB/FileA/testA.set","USB/FileA/testB.bin"

- Search files in the entire internal memory

  FILE? "INMEM"

- Search files on the entire USB memory

  FILE? "USB"

3.14.9. MKDIR Command (Creating a directory)

MKDIR Command creates a directory on the internal memory or USB memory.

■ Command

Command syntax

MKDIR <dir>

<dir> : Directory path you want to create

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

Remarks

- When the same directory name exists, a device-specific error (DDE) will occur.
- Some characters cannot be used in <dir>. The following characters cannot be used.

  ¥:*?”<>|

  Using these characters will result in a Command error (CME). However, double coating (“)” can only be used by enclosing the <dir> string.

Example of use

Create directory FileA on USB memory

MKDIR “USB/FileA”

3.14.10. RMVF Command (Delete directory / file)

RMVF Command deletes the directory or file in the internal memory or USB memory.

■ Command

Command syntax

RMVF <file>

<file> : The path of the file or directory you want to delete

Data Format	Setting
CHARACTER PROGRAM DATA	Specify the file name to be saved in the internal memory or USB memory. Enter the <file> with an absolute path. To specify the save destination media, write "USB /" for the USB memory or "INMEM /" for the internal memory at the beginning of the file path. The slash (/) can only be used to separate directories.

Remarks

Some characters cannot be used in <file>. The following characters cannot be used.

¥:*?”<>|

Using these characters will result in a Command error (CME). However, double coating (“)” can only be used by enclosing the <file> string.

Example of use

- Delete the directory FileA on the USB memory

  RMVF “USB/FileA”

- Delete the file "Setup.set" in Direct File B in the internal memory.

  RMVF “INMEM/FileB/Setup.set”

3.15. ZOOM GROUP

3.15.1. SWZOOM Command / Query (ZOOM Screen display)

SWZOOM Command sets whether to display the ZOOM screen.

SWZOOM? Query queries the current state of the ZOOM screen.

■ Command

Command syntax

SWZOOM <zoom1> , <zoom2>

<zoom1>: ZOOM1 Function ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<zoom2>: ZOOM2 Function ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

■ Query

Query syntax

SWZOOM?

RESPONSE MESSAGE

<zoom1> , <zoom2>

Parameter	Data Format
<zoom1>	CHARACTER RESPONSE DATA
<zoom2>	CHARACTER RESPONSE DATA

3.15.2. SELZOOM Command / Query (ZOOM Screen selection)

SELZOOM Command sets the ZOOM screen to focus on.

SELZOOM? Query queries the currently focused ZOOM or MAIN screen.

■ Command

Command syntax

SELZOOM <display>

<display>: Waveform display method

Data Format	Setting
CHARACTER PROGRAM DATA	MAIN, ZOOM1, ZOOM2

■ Query

Query syntax

SELZOOM?

RESPONSE MESSAGE

<display>

Parameter	Data Format
<display>	CHARACTER RESPONSE DATA

3.15.3. ZMSCALE Command / Query (Vertical axis ZOOM scale setting)

ZMSCALE Command sets the scale of the channel or the vertical axis of Math.

ZMSCALE? Query queries the current vertical ZOOM scale for the specified channel or Math.

■ Command

Command syntax

<Channel> or <Math>:ZMSCALE <zoom_scale>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<zoom_scale>: Zoom scale of the target Channel or Math

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0.001 / div to +10.0 / div

Remarks

- Executing ZMSCALE Command when SELZOOM is MAIN results in a device-specific error (DDE).
- When ZMSFINE Command is ON, <zoom_scale> can be set to a finer value.

■ Query

Query syntax

<channel>or<Math>:ZMSCALE?

RESPONSE MESSAGE

<zoom_scale>

Parameter	Data Format
<zoom_scale>	NR3 NUMERIC RESPONSE DATA

Remarks

If you execute ZMSCALE? Query when SELZOOM is MAIN, you will get "+ 9.9100000E + 37".

3.15.4. ZMSFINE Command / Query (Vertical axis ZOOM scale Fine switching)

ZMSFINE Command sets Vertical axis ZOOM scale ON / OFF.

ZMSFINE? Query queries the Fine ON / OFF of the current Vertical axis ZOOM scale.

■ Command

Command syntax

<Channel>:ZMSFINE <function>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<function>: Vertical axis ZOOM scale ON / OFF.

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Remarks

- When you execute ZMSFINE Command when SELZOOM is MAIN, a device-specific error (DDE) occur.
- Fine can only be set to the Vertical axis ZOOM scale of the Channel.

■ Query

Query syntax

<channel>:ZMSFINE?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

Remarks

If you execute ZMSFINE? Query when SELZOOM is MAIN, you will get "OFF".

3.15.5. ZMPOS Command / Query (Vertical axis ZOOM position setting.)

ZMPOS Command sets the vertical axis position of the channel or Math.

ZMPOS? Query queries the current vertical axis ZOOM position for the specified channel or Math.

■ Command

Command syntax

<Channel> or <Math>:ZMPOS <zoom_position>

<Channel>: Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<Math>: Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

<zoom_position>: Zoom position of target Channel or Math

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-5div to +5div

Remarks

Executing ZMPOS Command when SELZOOM is MAIN results in a device-specific error (DDE).

■ Query

Query syntax

<channel> or <Math>:ZMPOS?

RESPONSE MESSAGE

<zoom_position>

Parameter	Data Format
<zoom_position>	NR3 NUMERIC RESPONSE DATA

Remarks

If you execute ZMPOS? Query when SELZOOM is MAIN, you will get "+9.9100000E + 37".

3.15.6. ZMTDV Command / Query (Horizontal axis ZOOM scale setting)

ZMTDV Command sets the ZOOM scale of the horizontal axis.

ZMTDV? Query queries the ZOOM scale for the current horizontal axis.

■ Command

Command syntax

ZMTDV <zoom_scale>

<zoom_scale> : Horizontal axis ZOOM scale

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	The maximum and minimum values depend on the MLEN and TDIV values.

Remarks

- Executing ZMTDV Command when SELZOOM is MAIN will result in a device-specific error (DDE).
- When ZMTFINE is ON, <zoom_scale> can be set to a finer value.

■ Query

Query syntax

ZMTDV?

RESPONSE MESSAGE

<zoom_scale>

Parameter	Data Format
<zomm_scale>	NR3 NUMERIC RESPONSE DATA

Remarks

If you execute ZMTDV? Query when SELZOOM is MAIN, you will get "+ 9.9100000E + 37".

3.15.7. ZMTFINE Command / Query (horizontal axis ZOOM scale fine switching)

ZMTFINE Command sets horizontal axis ZOOM scale Fine ON / OFF.

ZMTFINE? Query queries the current horizontal axis ZOOM scale Fine ON / OFF.

■ Command

Command syntax

ZMTFINE <function>

<function> : Horizontal axis ZOOM scale Fine ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

Remarks

Executing ZMTFINE Command when SELZOOM is MAIN results in a device-specific error (DDE).

■ Query

Query syntax

ZMTFINE?

RESPONSE MESSAGE

<function>

Parameter	Data Format
<function>	CHARACTER RESPONSE DATA

Remarks

If you execute ZMTFINE? Query when SELZOOM is MAIN, you will get "OFF".

3.15.8. ZMHPOS Command / Query (Horizontal axis ZOOM position setting)

ZMHPOS Command sets horizontal axis ZOOM position.

ZMHPOS? Query queries thecurrent horizontal axis ZOOM position.

■ Command

Command syntax

ZMHPOS <zoom_position>

<zoom_position>: Horizontal axis Zoom position

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	-300 s to +300 s

Remarks

Executing ZMHPOSCommand when SELZOOM is MAIN results in a device-specific error (DDE).

■ Query

Query syntax

ZMHPOS?

RESPONSE MESSAGE

<zoom_position>

Parameter	Data Format
<zoom_position >	NR3 NUMERIC RESPONSE DATA

Remarks

If you execute ZMHPOS? Query when SELZOOM is MAIN, you will get "+9.9100000E + 37".

3.15.9. ZMRST Command (Vertical axis ZOOM reset)

ZMRST Command resets the channel or Math ZOOM settings.

- Command

Command syntax

<Channel>or<Math>:ZMRST

<Channel> : Channel header

Format	Setting
Command Program Header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<Math> : Math header

Format	Setting
Command Program Header	M1, M2, M3, M4, M5, M6, M7, M8

Remarks

Executing ZMRST Command when SELZOOM is MAIN results in a device-specific error (DDE).

3.15.10. ZMTRA Command / Query(ZOOM display of each source)

The ZMTRA command sets the channel or Math ZOOM display.

The ZMTRA? Query queries the current ZOOM display for the specified channel or Math.

■ Command

Command yntax

<Channel>or<Math>:ZMTRA <trace>

<Channel>: Channel header

Format	Setting
Command program header	{C1, C2, C3, C4, C5, C6, C7, C8} (DS-8108 / 8058 / 8038) {C1, C2, C3, C4} (DS-8104 / 8054 / 8034)

<Math> : Math header

Format	Setting
Command program header	M1, M2, M3, M4, M5, M6, M7, M8

<trace>: ZOOM display ON / OFF

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	ON, OFF

Remarks

Executing the ZMTRA command when SELZOOM is MAIN results in a device-specific error (DDE).

■ Query

Query syntax

<channel>or<Math>:ZMTRA?

RESPONSE MESSAGE

<trace>

Parameter	Data Format
<trace>	CHARACTER RESPONSE DATARESPONSE MESSAGE

3.15.11. VZOOM Command / Query (Enable/Disable vertical zoom)

VZOOM command enables/disables vertical axis zooming.

VZOOM? query retrieves the vertical axis zoom enable/disable.

- Command

  Command syntax

  VZOOM <zoom1>,<zoom2>

  <zoom1> : Enable/Disable vertical axis zoom for zoom 1

Format	Setting
character program data	ON, OFF

  <zoom2> : Enable/Disable vertical axis zoom for zoom 2

Format	Setting
character program data	ON, OFF

- Query

  Query syntax

  VZOOM?

  RESPONSE MESSAGE

  <zoom1>,<zoom2>

Parameter	Data Format
<zoom1>	CHARACTER RESPONSE
<zoom2>	CHARACTER RESPONSE

3.15.12. ZMALGN command/query (Zoom 1-2 positions)

ZMALGN command sets the ZOOM1 and ZOOM2 positions.

ZMALGN? query retrieves the ZOOM1 and ZOOM2 positions.

- Command

  Command syntax

  ZMALGN <align>

  <align> : Zoom1-2 position

Format	Setting
character program data	VERTICALLY, HORIZONTALLY VERTICALLY : ZOOM1 and ZOOM2 are displayed vertically side by side. HORIZONTALLY : ZOOM1 and ZOOM2 are displayed side by side.

- Query

  Query syntax

  ZMALGN?

  RESPONSE MESSAGE

  <align>

Parameter	Data Format
<align>	CHARACTER RESPONSE

3.16. DATA TRANSFER GROUP

3.16.1. DTBORD Command / Query (Data transfer endian)

DTBORD Command sets the byte order when transferring the waveform data.

DTBORD? Query queries the current byte order.

■ Command

Command syntax

DTBORD <order>

<order> : Data transfer order

Data Format	Setting
CHARACTER PROGRAM DATA	H/L, L/H ・ H/L : When transferring data, the high-order byte is sent first. (Big endian) ・ L/H : When transferring data, the low-order byte is sent first. (Little endian)

■ Query

Query syntax

DTBORD?

RESPONSE MESSAGE

<order>

Parameter	Data Format
<order>	CHARACTER RESPONSE DATA

3.16.2. DTFORM Command / Query (Data Format settings for data transfer)

DTFORM Command sets the Format when transferring the waveform data.

DTFORM? Query queries the current waveform data transfer Data Format.

■ Command

Command syntax

DTFROM <form>

<form>: Waveform Data Format

Data Format	Setting
CHARACTER PROGRAM DATA	ASCII, BYTE, WORD, DWORD

About Waveform Data Format

Data Format	Description
ASCII	Transfers waveform data in ASCII mode. ASCII data transfer with DTWAVE? Data Format is as follows. Top of screen grid :32512 Center of screen grid :0 Bottom of screen grid :-32768 Voltage value = ASCII numerical value ÷ 6553.6 × voltage range*-Offset value* *The voltage range and offset value are obtained from DTINF? Query.
BYTE	Transfer the waveform data in binary mode and use BYTE Data Format.
WORD	Transfer the waveform data in binary mode and use WORD Data Format. The byte order of words can be specified with the DTBORD Command.
DWORD	Transfer the waveform data in binary mode and use DWORD Data Format. The byte order of words can be specified with the DTBORD Command.

■ Query

Query syntax

DTFORM?

RESPONSE MESSAGE

<form>

Parameter	Data Format
<form>	CHARACTER RESPONSE DATA

3.16.3. DTINF? Query (Waveform information)

DTINF? Query queries Waveform information

■ Query

Query syntax

DTINF?

RESPONSE MESSAGE

See the table below.

Item Number (8CH/4CH)	Item (response example)	Description	Note
1/1	ModelName= IWATSU DS-8108	Model name	
2/2	FileVersion = 1	Version of the information Format	The version is the version of the setup data.
3/3	SaveTime= 2020/06/08	Date and time when the waveform information was created	
4/4	[Channel1]	Channel 1 vertical information category name	
5/5	Volts/div = 5.00 V	CH1 V/div when the last waveform was captured	Probe ratios and rescales are not considered.
6/6	Offset=7.50 V	CH1 Offset when the last waveform was captured	Probe ratios and rescales are not considered.
7/7	Waveform = Available	Existence of CH1 waveform data	It becomes [Unavailable] depending on the situation. ・Trace is off ・Trigger is not completed.
8/8	[Channel2]	Channel 2 vertical information category name	
9/9	Volts/div = 100 mV	CH2 V / div when the last waveform was captured	Probe ratios and rescales are not considered.
10/10	Offset=-150mV	CH2 Offset when the last waveform was captured	Probe ratios and rescales are not considered.
11/11	Waveform = Unavailable	Existence of CH2 waveform data	

12/12	[Channel3]	Channel 3 Vertical information category name	
13/13	Volts/div = 100 mV	CH3 V / div when the last waveform was captured	Probe ratios and rescales are not considered.
14/14	Offset=-150 mV	CH3 Offset when the last waveform was captured	Probe ratios and rescales are not considered.
15/15	Waveform = Unavailable	Existence of CH3 waveform data	
16/16	[Channel4]	Channel 4 Vertical information category name	
17/17	Volts/div = 100 mV	CH4 V / div when the last waveform was captured	Probe ratios and rescales are not considered.
18/18	Offset=-150 mV	CH4 Offset when the last waveform was captured	Probe ratios and rescales are not considered.
19/19	Waveform = Unavailable	Existence of CH4 waveform data	
20/-	[Channel5]	Channel 5 Vertical information category name	
21/-	Volts/div = 100 mV	CH5 V / div when the last waveform was captured	Probe ratios and rescales are not considered.
22/-	Offset=-150 mV	CH5 Offset when the last waveform was captured	Probe ratios and rescales are not considered.
23/-	Waveform = Unavailable	Existence of CH5 waveform data	
24/-	[Channel6]	Channel 6 Vertical information category name	
25/-	Volts/div = 100 mV	CH6 V / div when the last waveform was captured	Probe ratios and rescales are not considered.
26/-	Offset=-150 mV	CH6 Offset when the last waveform was captured	Probe ratios and rescales are not considered.
27/-	Waveform = Unavailable	Existence of CH6 waveform data	
28/-	[Channel7]	Channel 7 Vertical information category name	
29/-	Volts/div = 100 mV	CH7 V / div when the last waveform was captured	Probe ratios and rescales are not considered.

30/-	Offset=-150 mV	CH7 Offset when the last waveform was captured	Probe ratios and rescales are not considered.
31/-	Waveform = Unavailable	Existence of CH7 waveform data	
32/-	[Channel8]	Channel 8 Vertical information category name	
33/-	Volts/div = 100 mV	CH8 V / div when the last waveform was captured	Probe ratios and rescales are not considered.
34/-	Offset=-150 mV	CH8 Offset when the last waveform was captured	Probe ratios and rescales are not considered.
35/-	Waveform = Unavailable	Existence of CH8 waveform data	
36/20	[Horizontal]	Horizontal information category name	
37/21	Time/div = 500 ms	Time / div when the last waveform was captured	
38/22	Delay= +0.000000000000 s	Trigger delay (Trigger position) when the last waveform was captured	
39/23	[Acquisition]	Category name of Acquisition information	
40/24	Memory Length= 50000	Actual memory length of the captured waveform	The value is. The is the data length of the current waveform, not the maximum memory length setting.
41/25	Average Count = 0	Number of averaging of the last waveform	The value will be the actual averaged time. The value will be between 0 and 65536.
42/26	Wave Info = Normal	Mode of capture of last waveform	
43/27	[Timebase Info]	Category name of time-based information	
44/28	Time Stamp= 15:13:34:7	Timestamp of last waveform capture	
45/29	Sampling = 100 kS	Sampling rate when the last waveform was captured	

Remarks

- DTINF? Query does not support Compound Command.
- When the waveform is not drawn, the response will be “No Waveform”.

3.16.4. DTPOINTS Command / Query (Amount of data of transfer waveform)

DTPOINTS Command sets Amount of data of transfer waveform.

DTPOINTS? Query queries the current amount of data of transfer waveform.

■ Command

Command syntax

DTPOINTS <points>

<points> : Amount of data of transfer waveform

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0 to (Waveform data length – DTSTART)

Remarks

If you execute DTPOINTSCommand when the waveform is not drawn, <points> will be 0.

■ Query

Query syntax

DTPOINTS?

RESPONSE MESSAGE

<points>

Parameter	Data Format
<points>	NR1 NUMERIC RESPONSE DATA

3.16.5. DTSTART Command / Query (Forwarding start address)

DTSTART Command sets the transfer start address for waveform data transfer.

DTSTART? Query queries the current forwarding start address.

■ Command

Command syntax

DTSTART <start>

<start>: Start address of transfer waveform data

Data Format	Setting
DECIMAL NUMERIC PROGRAM DATA	0 to (Waveform data length – 1)

Remarks

When you execute DTSTARTCommand when the waveform is not drawn, <start> will be 0.

■ Query

Query syntax

DTSTART?

RESPONSE MESSAGE

<start>

Parameter	Data Format
<start>	NR1 NUMERIC RESPONSE DATA

3.16.6. DTWAVE? Query (Waveform data transfer)

DTWAVE? Query transfers waveform data.

■ Query

Query syntax

DTWAVE?

RESPONSE MESSAGE

See the table below.

Waveform Transfer Format	Description
ASCII	<ascii_block> contains block data. Each data unit is separated by a comma. [Data example] D0, D1, ..., Dn Di（i = 0、1、...、n）is described in the Data Format of the NR1 numeric response.
DTFORM Command is set to "BYTE / WORD / DWORD" (binary transfer). · # 9 indicates that RESPONSE MESSAGE is described in the Data Format of <Definite Length Arbitrary Block Response Data>, and the content of <byte_length> after that is a 9-digit ASCII string. · The content of <byte_length> represents the number of bytes contained in <binary_block>. The byte lengthe always an unsigned 9-digit integer containing 0s. · The contents of <binary_block> represent the waveform data stored in binary code in the internal memory of the product.	
BYTE	Since 1 unit of data is transferred in 1 byte, the number of bytes matches the number of transferred data specified by DTPOINTS Command. [Data example] # 9 0 0 0 0 0 1 0 2 4 D0 D1 --- Dn 1024 bytes of binary data are transferred, and Di (i = 1, 2, ..., n) corresponds to one unit of data.

Continued on the next page

<table>
<tr><td>WORD</td><td>Since one unit of data is transferred in 2 bytes, the number of bytes transferred is twice the number of transferred data specified by DTPOINTS Command.
[Data example]
When the byte order is specified as H / L in DTBORDCommand
9 0 0 0 0 0 2 0 4 8 U0 L0 U1 L1 --- Un Ln
When the byte order is specified as L / H in DTBORDCommand
9 0 0 0 0 0 2 0 4 8 L0 U0 L1 U1 ---- Ln Un
・2048 bytes of binary data (U0, L0, U1, L1, ..., Un, Ln) are transferred.
・Ui and Li (i = 1, 2, ..., n) correspond to the upper and lower 1 byte of 1 unit of data, respectively.</td></tr>
<tr><td>DWORD</td><td>Since one unit of data is transferred in 4 bytes, the number of bytes transferred is four times the number of transferred data specified by DTPOINTS Command.
[Data example]
・ When the byte order is specified as H / L in DTBORDCommand
9 0 0 0 0 0 4 0 9 6 A0 B0 C0 D0 --- An Bn Cn Dn
・ When the byte order is specified as L / H in DTBORD Command
・ # 9 0 0 0 0 0 4 0 9 6 D0 C0 B0 A0 --- Dn Cn Bn An
-4096 bytes of binary data (A0, B0, C0, D0, A1, B1, C1, D1, ..., An, Bn, Cn, Dn) are transferred.
・Ai, Bi, Ci, and Di correspond to the 4 bytes in the table below that make up one unit of data in DWORD.
・Ai, Bi, Ci, and Di correspond to the 4 bytes in the table below that make up one unit of data in DWORD.
<table>
<tr><td colspan="4">DWORD(4 bytes)</td></tr>
<tr><td colspan="2">Most significant</td><td colspan="2">Lower significant</td></tr>
<tr><td>Ai
(1bytes)</td><td>Bi
(1bytes)</td><td>Ci
(1bytes)</td><td>Di
(1bytes)</td></tr>
</table>
</td></tr>
</table>

Remarks

DTWAVE? Query does not support Compound Command.

3.16.7. SETUP Command / Query (Writing / reading of setting condition data in text format)

SETUP Command sends the setting condition data in text format to the product and sets it.

SETUP? Query acquires the setting condition data in text format from the product.

■ Command

Command syntax

SETUP<LF>#9<byte-length><binary-block>

<byte-length>: Amount of data for SETUP data

Data Format	Setting
<DefiniteLength Arbitrary Block Response Data>	The number of bytes of setting condition data that can be stored in <binary-block>. It consists of a 9-digit ASCII string, and if the number of bytes is less than 9, insert 0 at the beginning to make it 9 digits. If the number of bytes is 3830 bytes, it will be # 9000003830.

<binary-block>

Data Format	Setting
<Definite Length Arbitrary Block Response Data>	This is setting condition data in text format.

Remarks

Send the SETUP Command in the following two steps.

Step 1：

Send a SETUP Command without parameters. By the operation, the product is ready to receive the setting condition data block.

Step 2：

Setting condition Data block is sent in # 9 <byte-length> <binary-block> Data Format.

・<byte-length> is the number of bytes of setting condition data that can be stored in <binary-block>. It consists of a 9-digit ASCII string, and When the number of bytes is less than 9, insert 0 at the beginning to make it 9 digits. When the number of bytes is 3830 bytes, it will be # 9000003830.

■ Query

Query syntax

SETUP?

RESPONSE MESSAGE

#9<byte-length><binary-block>

Remarks

SETUP Command / Query does not support Compound Command.

3.16.8. TSCRN? Query (Screen data transfer)

TSCRN? Query transfers screen data in PNG Data Format.

■ Query

Query syntax

TSCRN? <transparency>,<scheme>

<transparency>: Screen data transparency ON / OFF

Data Format	Setting
CHARACTER PROGRAM DATA	ON, OFF

<scheme> : Screen data color scheme

Data Format	Setting
CHARACTER PROGRAM DATA	SCHEME1, SCHEME2, SCHEME3

RESPONSE MESSAGE

#9<byte_length><binary_block>

Remarks

- # 9 indicates that RESPONSE MESSAGE is described in the Data Format of <Definite Length Arbitrary Block Response Data>, and the content of <byte_length> after that is 9-digit data.
- The content of <byte_length> represents the number of bytes that go into <binary_block>. The byte lengthe always an unsigned 9-digit integer. At that time, the leading 0 is not deleted.
- The content of <binary_block> represents the binary data described in the Data Format of the specified screen data.
- TSCRN? Query does not support Compound Command.

3.16.9. WAVESRC Command / Query (Waveform transfer source settings)

WAVESRC Command sets Waveform transfer source

WAVESRC? Query queries Waveform transfer source

- Command

  Command syntax

  WAVESRC <source>

  <source>: Waveform transfer source

Data Format	Setting
CHARACTER PROGRAM DATA	{CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8, MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7, MATH8} (DS-8108 / 8058 / 8038) {CH1, CH2, CH3, CH4,MATH1, MATH2, MATH3, MATH4, MATH5, MATH6, MATH7,MATH8} (DS-8104 / 8054 / 8034)

- Query

  Query syntax

  WAVESRC?

  RESPONSE MESSAGE

  <source>

Parameter	Data Format
<source>	CHARACTER RESPONSE DATA

3.17. CONFIGURE THE OSCILLOSCOPE

3.17.1. DATE Command / Query (Date and time settings)

DATE Command sets the date and time

DATE? Query queries the current time and date.

- Command

Command syntax

DATE <day>,<month>,<year>,<hour>,<minute>,<second>

<day>: day

Data Format	Setting
CHARACTER PROGRAM DATA	1 to 31

<month>: month

Data Format	Setting
CHARACTER PROGRAM DATA	JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC

<year>: year

Data Format	Setting
CHARACTER PROGRAM DATA	2018 to 2099

<hour>: hour

Data Format	Setting
CHARACTER PROGRAM DATA	0 to 23

<minute>: minute

Data Format	Setting
CHARACTER PROGRAM DATA	0 to 59

<second>: second

Data Format	Setting
CHARACTER PROGRAM DATA	0 to 59

■ Query

Query syntax

DATE?

RESPONSE MESSAGE

<day>,<month>,<year>,<hour>,<minute>,<second>

Parameter	Data Format
<day>	CHARACTER RESPONSE DATA
<month>	CHARACTER RESPONSE DATA
<year>	CHARACTER RESPONSE DATA
<hour>	CHARACTER RESPONSE DATA
<minute>	CHARACTER RESPONSE DATA
<second>	CHARACTER RESPONSE DATA

3.17.2. SYSTEM? Query (Get system status)

SYSTEM? Query obtains the system status of the digital oscilloscope.

■ Query

Query syntax

SYSTEM?

RESPONSE MESSAGE

<state>

Parameter	Format
<state>	NR1 NUMERIC RESPONSE DATA

Remarks

<state> is a value weighted by a power of 2 for each bit of the following register. The following is an explanation of the values.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
reservation	reservation	reservation	reservation	Probe overload	Overheat	Warming up※	startup (point in) error

*Warm-up Time is 20 minutes from power-on. 20 minutes elapsed Then Bit1 becomes 0.

DS-8108/DS-8104/DS-8058/DS-8054/DS-8038/DS-8034

IWATSU