

SL1400
ScopeCorder LITE
Communication Interface
U S E R ' S M A N U A L

Foreword

Thank you for purchasing YOKOGAWA's SL1400 ScopeCorder LITE.

This Communication Interface User's Manual describes the functions and commands of the GP-IB, serial (RS-232, option), USB, and Network (Ethernet, option) interfaces. To ensure proper use of the GP-IB/serial (RS-232)/USB interfaces, please read this manual thoroughly.

Keep the manual in a safe place for quick reference whenever a question arises.

Three manuals are provided with the SL1400 including this Communication Interface User's Manual.

Manual Name	Manual No.	Description
SL1400 User's Manual	IM 701240-01E	Describes all functions except for the communications functions and operation procedures of the instrument.
SL1400 Communication User's Manual	IM 701240-17E	Describes the communications functions of the GP-IB/serial (RS-232, option)/USB/Network interface.

Notes

- The contents of this manual are subject to change without prior notice as a result of improvements in instrument's performance and functions.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA representative.
- Copying or reproduction of all or any part of the contents of this manual without YOKOGAWA's permission is strictly prohibited.
- A guarantee card is attached to the instrument. The card will not be reissued, so please read it carefully and keep it in a safe place.
- The TCP/IP software used in this product and the documentation for that TCP/IP software are based in part on BSD Networking Software, Release 1 licensed from The Regents of the University of California.

USB Interface and Network Interface

- The following items must be installed on the PC to access the communications functions using the USB interface.
 1. A dedicated library for the USB interface.
 2. A USB device driver for the PC-to-SL1400 connection.
- The following item must be installed on the PC to access the communications functions using the network interface.
 1. A dedicated library for the network interface.

The library and driver above can be downloaded from the following Web page.

http://www.yokogawa.com/tm/dl_driver.htm

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How to Use this Manual

Structure of this Manual

This User's Manual consists of eight chapters, an Appendix and an Index as described below.

Chapter 1 Overview of the GP-IB Interface

Describes the functions and specifications of GP-IB interface.

Chapter 2 Overview of the Serial (RS-232) Interface

Describes the functions and specifications of serial interface (RS-232).

Chapter 3 Overview of the USB Interface

Describes the functions and specifications of USB interface.

Chapter 4 Overview of the Network Interface (Option)

Describes the functions and specifications of Network interface.

Chapter 5 Before Programming

Describes formats used when sending a command.

Chapter 6 Commands

Describes each command.

Chapter 7 Status Report

Describes the status byte, various registers and queues.

Chapter 8 Sample Programs

Sample programs, written in Visual BASIC, for MS-DOS/V machines equipped with the following GP-IB board: PCI-GPIB IEEE-488.2, from National Instruments.

Appendix

Contains references including the ASCII character code table.

Index

Provides an alphabetically ordered index.

Conventions Used in this Manual

Symbols Used for Notes and Keys

Type	Symbol	Description
Unit	k	1000 e.g.: 100 kS/s (sample rate)
	K	1024 e.g.: 720 KB (floppy disk memory capacity)
Notes	Note	Provides information that is necessary for proper operation of the instrument.
Key	"Probe"	Indicates text of the soft key menu displayed on the screen.

Symbols Used in Syntax Descriptions

Symbols which are used in the syntax descriptions in Chapter 6 are shown below. These symbols are referred to as BNF notation (Backus-Naur Form). For detailed information, refer to page 5-5.

Symbol	Description	Example	Example of Input
<x>	Defined value	CHANnel <x> <x>=1 to 4	-> CHANNEL2
{ }	One of the options in { } is selected.	COUPLing {AC DC GND}	-> COUPLING AC
	Exclusive OR		
[]	Abbreviated	TRIGger [:SIMPLE]:SLOPe	-> TRIGger:SLOPe

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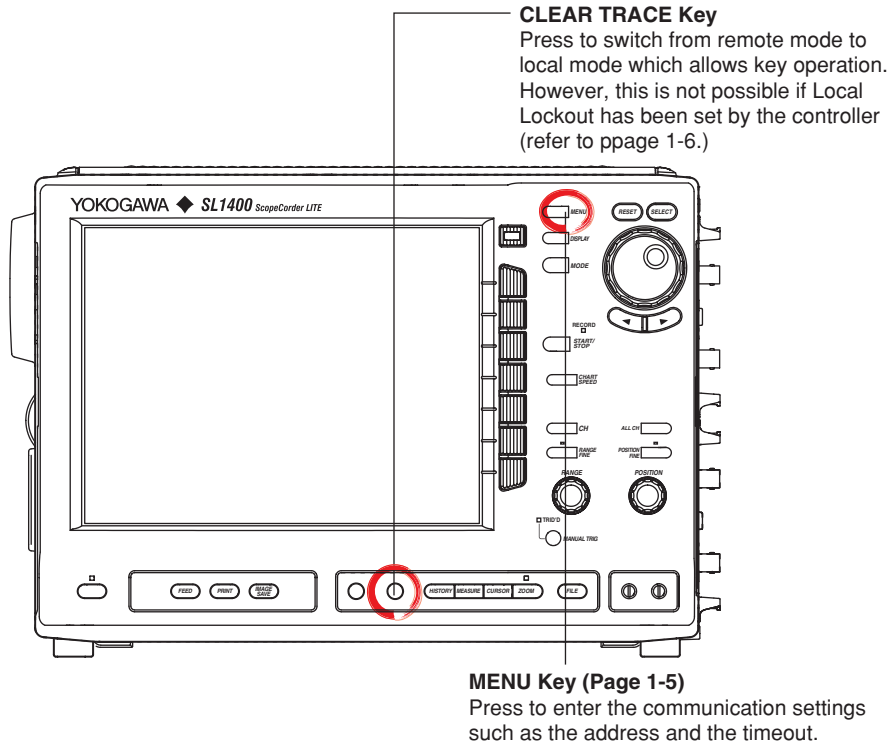
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Chapter 1 Overview of the GP-IB Interface

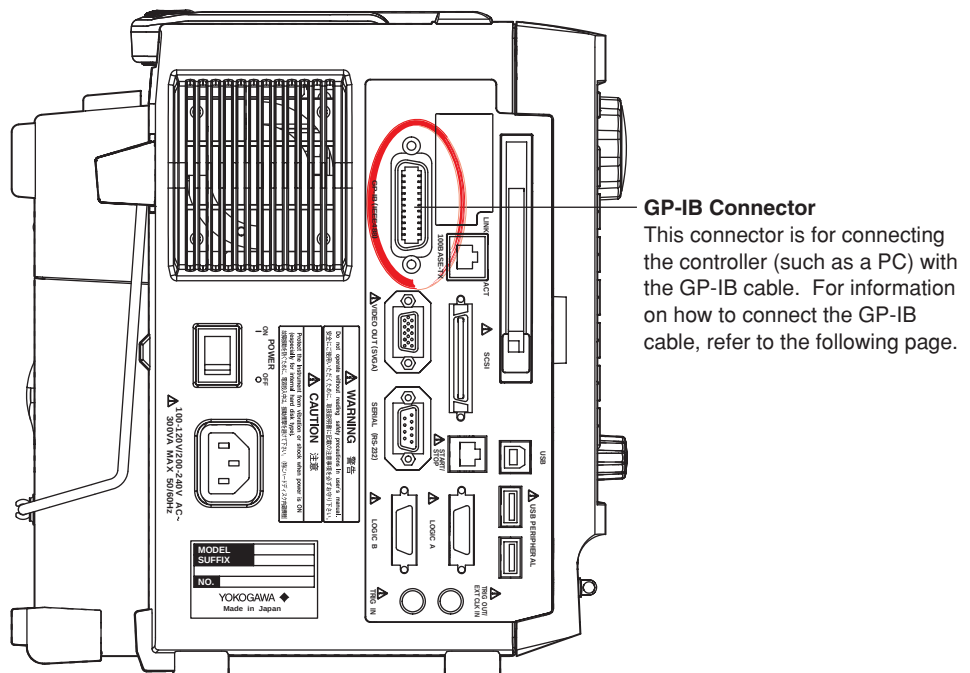
1

1.1 Names of the Parts and their Function

Front Panel



Side Panel



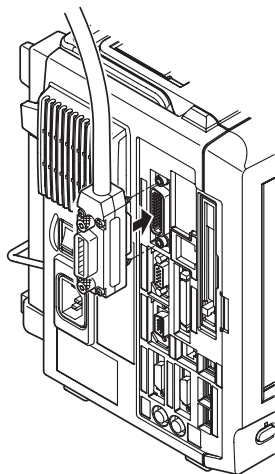
1.2 Connection via the GP-IB Interface

GP-IB Cable

The GP-IB connector on the side panel of the SL1400 is a 24-pin connector that conforms to IEEE Standard 488-1978. Use a GP-IB cable that also conforms to IEEE Standard 488-1978.

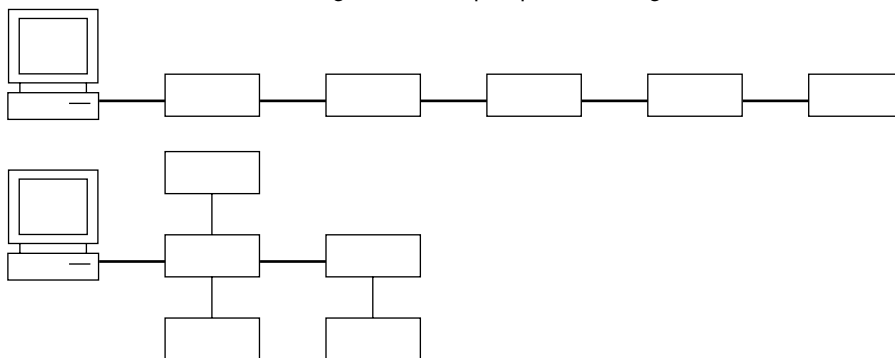
Connection Method

Connect the GP-IB cable as shown below.



Connection Precautions

- Be sure to tighten the screws on the GP-IB cable connector firmly.
- The instrument can be connected to more than one item of equipment (e.g. a personal computer) if more than one GP-IB cable is used. However, it is not possible to connect more than 15 items of equipment (including the controller) to a single bus.
- If you connect the instrument to more than one item of equipment, make sure that a different address is used for each item.
- Each connecting cable must be 2 m or less in length.
- The total length of all the cables must not exceed 20 m.
- While communications are in progress, more than two-thirds of the connected equipment items must be turned ON.
- When connecting more than one item of equipment, connect them so that the connection route forms a star or linear configuration. Loop or parallel wiring is not allowed.



CAUTION

Be sure to switch off power to both your PC and the oscilloscope before connecting or disconnecting cables. Failure to switch power off may cause internal circuit failure or improper operation.

1.3 GP-IB Interface Functions

GP-IB Interface Functions

Listener Function

- Allows you to make the settings which you can make using the panel keys on the instrument, except for the power ON/OFF and GP-IB communications settings.
- Receives commands from a controller requesting output of set-up and waveform data.
- Also receives status report commands

Talker Function

Outputs set-up and waveform data.

Note

The listen-only, talk-only and controller functions are not available on this instrument.

Switching between Remote and Local Mode

When Switched from Local to Remote Mode

Remote mode is activated when a REN (Remote Enable) message is received from a controller while local mode is active.

- REMOTE is displayed on the upper right of the screen.
- All front panel keys except **CLEAR TRACE** can no longer be operated any more.
- Settings entered in local mode are retained.

When Switched from Remote to Local Mode

Pressing **CLEAR TRACE** in remote mode puts the instrument in local mode. However, this is not possible if Local Lockout has been set by the controller (page 1-7).

- The REMOTE indicator on the upper right of the screen is turned off.
- All front panel keys are operative.
- Settings entered in remote mode are retained.

Note

The GP-IB interface cannot be used simultaneously with other communications interfaces (serial (RS-232), USB, or network).

1.4 GP-IB Interface Specifications

GP-IB Interface Specifications

Electrical and Mechanical Specifications:	Conforms to IEEE Standard 488-1978.
Interface Functions:	Refer to the table below.
Protocol:	Conforms to IEEE Standard 488.2-1992.
Code:	ISO (ASCII) code
Mode:	Addressable mode
Address Setting:	Addresses 0 to 30 can be selected from the GP-IB setting screen in the remote control menu.
Remote Mode Clear:	Remote mode can be cleared by pressing CLEAR TRACE key. However, this is not possible if Local Lockout has been set by the controller.

Interface Functions

Function	Subset Name	Description
Source Handshaking	SH1	Full source handshaking capability
Acceptor Handshaking	AH1	Full acceptor handshaking capability
Talker	T6	Basic talker capability, serial polling, untalk on MLA (My Listen Address), no talk-only capability
Listener	L4	Basic listener capability, unlisten on MTA (My Talk Address), no listen-only capability
Service Request	SR1	Full service request capability
Remote Local	RL1	Full remote/local capability
Parallel Poll	PP0	No parallel polling capability
Device Clear	DC1	Full device clear capability
Device Trigger	DT0	No device trigger capability
Controller	C0	No controller function
Electrical Characteristic	E1	Open collector

Data Transfer Rate

The table below shows approximate response times for output of waveform data, assuming the following configuration.

Model:	701240
Controller:	EPSON Endeavor VZ-6000 (Pentium III, 733 MHz)
GP-IB Board:	NI AT-GPIB/TNT(PNP)
Programming Language:	Visual C++

Data Volume	Byte Format	Word Format	ASCII Format
1000	approx. 64 ms	approx. 68 ms	approx. 530 ms
10000	approx. 114 ms	approx. 160 ms	approx. 5.3 s
100000	approx. 673 ms	approx. 1.2 s	approx. 52.8 s
1000000	approx. 6.5 s	approx. 11.8 s	approx. 530 s

1.5 Setting up this Instrument (GP-IB)

Operating Procedure

Selecting the Communication Interface

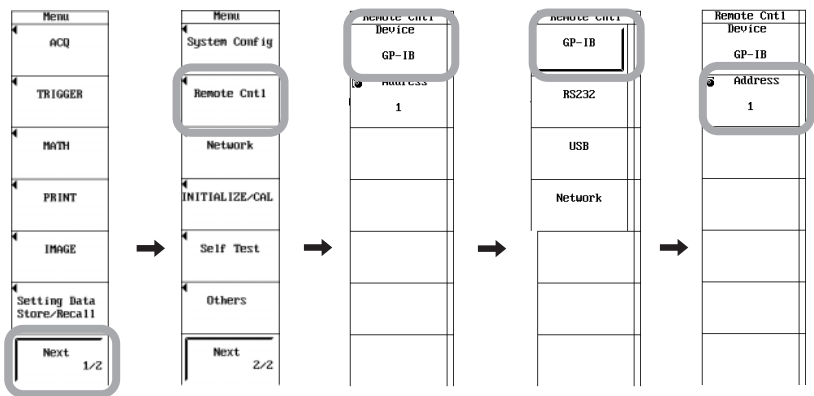
- 1. Press **MENU**.
- 2. Press the **Next 1/2** soft key.
- 3. Press the **Remote Cntl** soft key.
- 4. Press the **Device** soft key to select GP-IB.

Note

Only the communications interfaces selected under Device are available. If commands are sent using an unselected communications interface, the command will not be received.

Setting the Address

- 4. Turn the **jog shuttle** to set the desired address.



Explanation

When you make settings which can be made using the front panel keys of the instrument or when you output setup data or waveform data using the controller, the following settings must be made.

Setting the Address

This function allows you to set the instrument's address for addressable mode within the range of 0 to 30. Each item of equipment connected via a GP-IB interface has its own address, by which it can be identified. Care must be taken to ensure that all interconnected devices are assigned unique addresses.

Note

Do not change the address while the GP-IB interface is being used by the controller.

1.6 Response to Interface Messages

Response to Interface Messages

Response to a Uni-line Message

IFC(Interface Clear)

Clears the talker and listener. Stops output if data is being output.

REN(Remote Enable)

Switches between remote and local modes.

IDY (Identify) is not supported.

Response to a Multi-Line Message (Address Command)

GTL(Go To Local)

Switches to local mode.

SDC(Selected Device Clear)

Clears the program message (command) which is currently being output. Also clears the output queue (page 7-5).

*OPC and *OPC? will be disabled if they are currently being executed.

*WAI and :COMMunicate:WAIT will be stopped immediately.

PPC (Parallel Poll Configure), GET (Group Execute Trigger) and TCT (Take Control) are not supported.

Response to a Multi-Line Message (Universal Command)

LLO(Local Lockout)

Invalidates **SHIFT+CLEAR** on the front panel to disable switching to local mode.

DCL(Device Clear)

Same as SDC.

SPE(Serial Poll Enable)

Sets the talker function to serial poll mode for all equipment connected to the communications bus. The controller performs polling on equipment sequentially.

SPD(Serial Poll Disable)

Clears serial poll mode as the talker function for all equipment connected to the communications bus.

PPU (Parallel Poll Unconfigure) is not supported.

What is an Interface Message?

An interface message is also called an interface command or bus command, and is issued by the controller. Interface messages are classified as follows.

Uni-Line Messages

Messages are transferred through a single control line. The following three types of uni-line message are available.

IFC (InterFace Clear)

REN (Remote ENable)

IDY (IDentifY)

Multi-Line Message

Eight data lines are used to transmit a message. Multi-line messages are classified as follows.

Address Commands

Valid when the equipment is designated as a listener or a talker. The following five address commands are available.

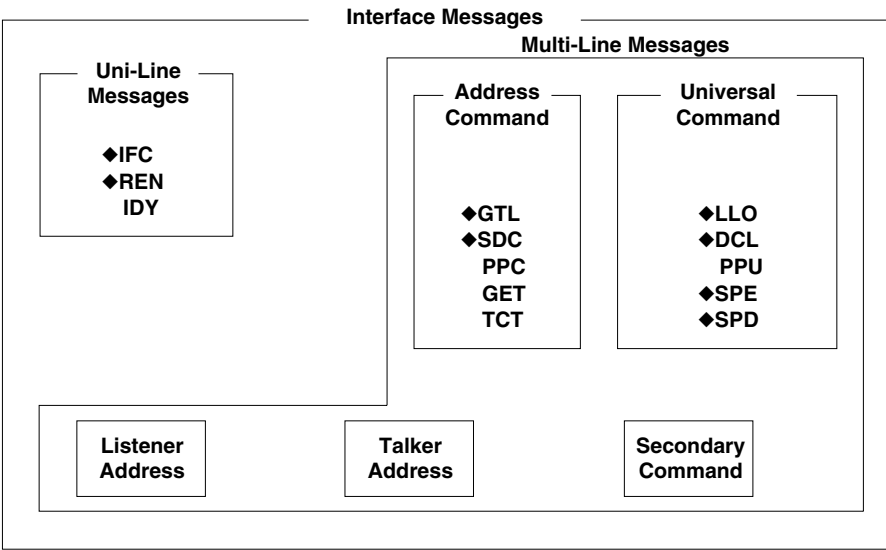
- **Commands valid for equipment designated as a listener;**
 - GTL (Go To Local)
 - SDC (Selected Device Clear)
 - PPC (Parallel Poll Configure)
 - GET (Group Execute Trigger)
- **Command valid for equipment designated as a talker;**
 - TCT (Take ConTrol)

Universal Commands

Valid for any item of equipment, irrespective of whether the item is designated as a listener or a talker. The following five universal commands are available.

- LLO (Local LockOut)
- DCL (Device CLear)
- PPU(Parallel Poll Unconfigure)
- SPE (Serial Poll Enable)
- SPD (Serial Poll Disable)

In addition to the above commands, a listener address, talker address on secondary command can be sent in an interface message.



Messages marked with a “♦” are interface messages supported by the SL1400.

Note

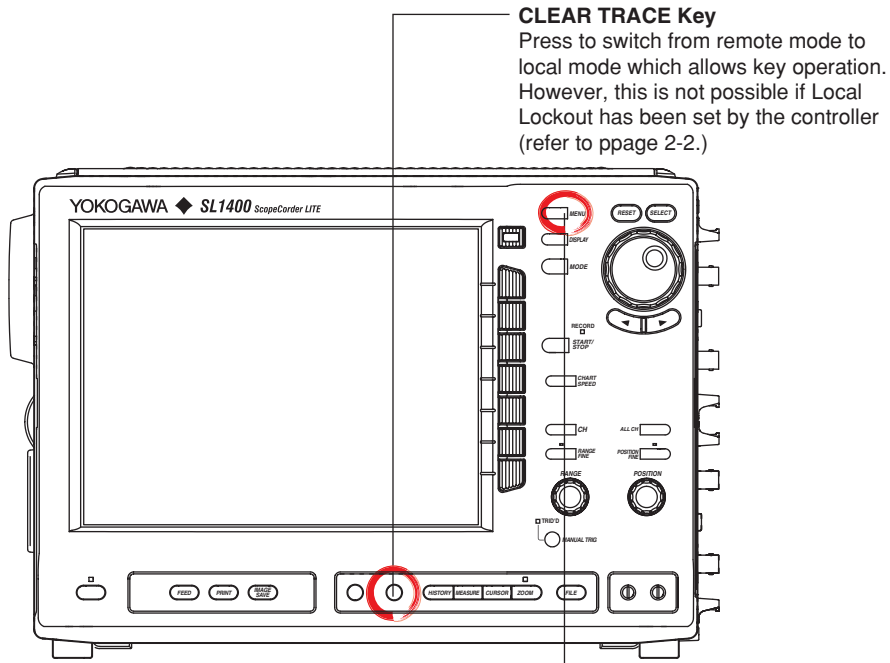
Differences between SDC and DCL

The SDC command is an address command and requires that both the talker and listener be designated; however DCL is a universal command and does not require that the talker and listener be designated. Therefore, SDC is used for particular items of equipment, while DCL can be used for any equipment connected to the communications bus.

Chapter 2 Overview of the Serial (RS-232) Interface

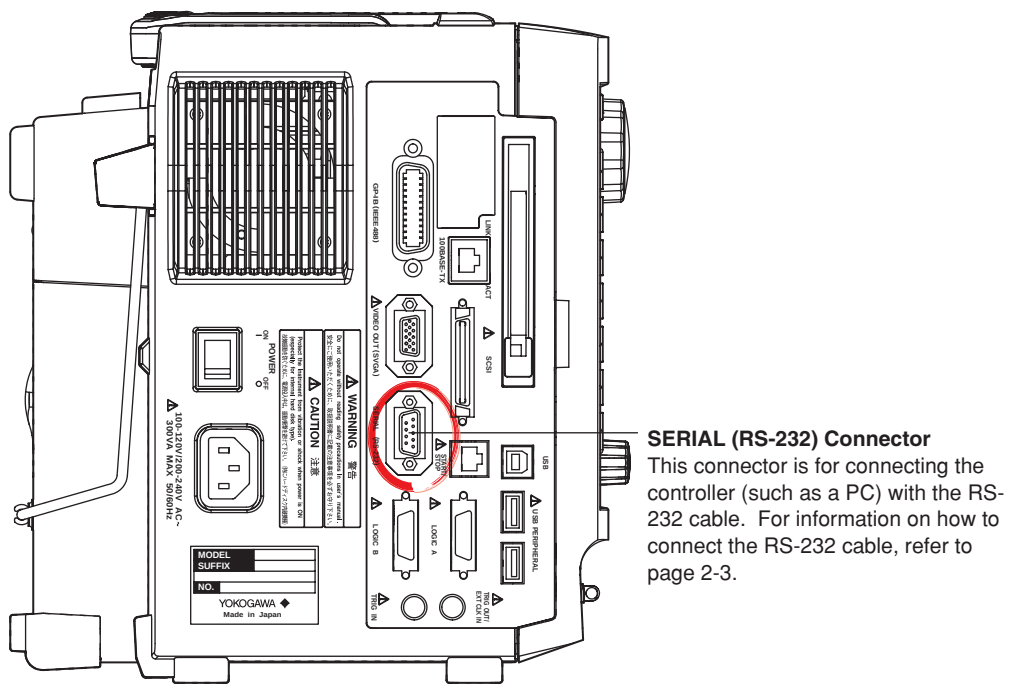
2.1 Names of the Parts and their Function

Front Panel



MENU Key (Page 2-8)
Press to enter the communication settings such as the baud rate , data format, and the handshaking method.

Side Panel



2.2 Serial (RS-232) Interface Functions and Specifications

Receiving Function

It is possible to make the same settings via the serial (RS-232) interface as can be made using the front panel keys.

Measured/computed data, setup data and error codes can be received.

Sending Function

Measured/computed data can be output.

Setup data and the status byte can be output.

Error codes which have occurred can be output.

Serial (RS-232) Interface Specifications

Electrical Characteristics:	Conforms to EIA 574 Standard (EIA-232 (RS-232) Standard for 9-pin)
Connection:	Point-to-point
Communications:	Full-duplex
Synchronization:	Start-stop system
Baud Rate:	1200, 2400, 4800, 9600, 19200, 38400, 57600
Start Bit:	1 bit (fixed)
Data Length:	7 or 8 bits
Parity:	Even, odd or no parity
Stop Bit:	1 or 2 bits
Connector:	DELC-J9PAF-13L6 (JAE or equivalent)
Hardware Handshaking:	User can select whether CA or CB signals will always be True, or will be used for control.
Software Handshaking:	User can control both transmission and reception using X-on and X-off signals. (X-on (ASCII 11H), X-off (ASCII 13H))
Receive Buffer Size:	256 bytes

Switching between Remote and Local Mode

When Switched from Local to Remote Mode

Remote mode is activated when the ":COMMunicate:REMOte ON" command is received from a controller while local mode is active.

- REMOTE is displayed on the upper right of the screen.
- All front panel keys except **CLEAR TRACE** can no longer be operated any more.
- Settings entered in local mode are retained.

When Switched from Remote to Local Mode

Pressing **CLEAR TRACE** in remote mode puts the instrument in local mode. However, this is not possible if Local Lockout (when the ":COMMunicate:LOCKout ON" command is received) has been set by the controller.

Local mode is activated when the ":COMMunicate:REMOte OFF" command is received regardless of Local Lockout.

- The REMOTE indicator on the upper right of the screen is turned off.
- All front panel keys are operative.
- Settings entered in remote mode are retained.

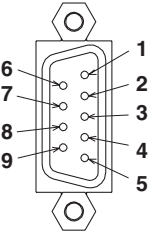
Note

The serial interface cannot be used simultaneously with other communications interface (GP-IB, USB, or network).

2.3 Connection via the Serial (RS-232) Interface

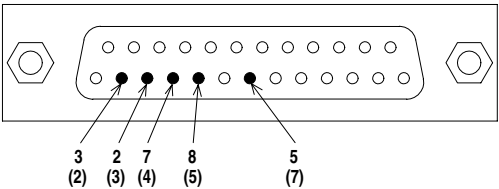
When connecting this instrument to a computer, make sure that the handshaking method, data transmission rate and data format selected for the instrument match those selected for the computer.
For details, refer to the following pages. Also make sure that the correct interface cable is used.

Connector and Signal Names



- 2 RD (Received Data): Data received from personal computer.
Signal direction...Input.
 - 3 SD (Send Data): Data transmitted to a personal computer.
Signal direction...Output.
 - 5 SG (Signal Ground): Ground for signals.
 - 7 RS (Request to Send): Signal used for handshaking when receiving data from a personal computer.
Signal direction...Output.
 - 8 CS (Clear to Send): Signal used for handshaking when transmitting data to a personal computer.
Signal direction...Input.
- * Pin Nos. 1, 4, 6, and 9 are not used.

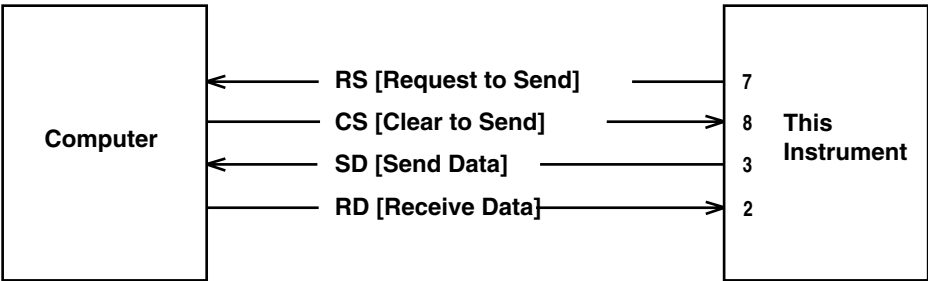
9-25 Pin Connector



The number between brackets refer to the pin No. of the 25-pin connector.

Signal Direction

The figure below shows the direction of the signals used by the serial (RS-232) interface.



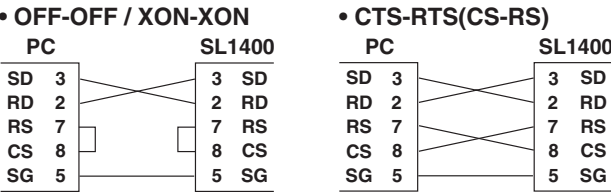
2.3 Connection via the Serial (RS-232) Interface

Table of RS-232 Standard Signals and their JIS and CCITT Abbreviations

Pin No. (9-Pin Connector)	Abbreviation			Description
	RS-232	CCITT	JIS	
5	AB (GND)	102	SG	Signal ground
3	BA (TXD)	103	SD	Transmitted data
2	BB (RXD)	104	RD	Received data
7	CA (RTS)	105	RS	Request to send
8	CB (CTS)	106	CS	Clear to send

Signal Line Connection Examples

The pin numbers shown are that of 9-pin connectors.
In general, use a cross cable.



2.4 Handshaking

To use an serial (RS-232) interface for transferring data between this instrument and a computer, it is necessary to use certain procedures by mutual agreement to ensure the proper transfer of data. These procedures are called “handshaking.” Various handshaking systems are available depending on the computer to be used; the same handshaking system must be used for both the computer and this instrument. This instrument allows you to choose any handshaking mode from the following three modes.

Handshake Format Descriptions→○

Handshake Method		Data Sending Control (Control Method When Sending Data to a Computer)			Data Receiving Control (Control Method When Receiving Data from a Computer)		
		Software Handshake	Hardware Handshake	No handshake	Software Handshake	Hardware Handshake	No handshake
		Sending stops when X-off is received, and sending is resumed when X-on is received.	Sending stops when CB(CTS) is False, and sending is resumed when CB is True.		X-off is sent when received data buffer becomes 3/4-full, and X-on is sent when the received data buffer is only 1/4-full.	CA (RTS) is set to False when received data buffer is only 3/4-full, and is set to True when received data buffer is only 1/4-full.	
	The Menu of this Instrument						
OFF-OFF	NO-NO			○			○
XON-XON	XON-XON	○			○		
CS-RS	CTS-RTS		○			○	

OFF-OFF

Transmission Data Control

There is no handshake status between the instrument and host computer. The X-OFF and X-ON signal from the host computer is processed as data, and the CS signal is ignored.

Reception Data Control

There is no handshake status between the recorder and host computer. When the recorder reception buffer becomes full, the excess data is discarded. RS = True (fixed).

XON-XON

Transmission Data Control

A software handshake status is established between the instrument and host computer. The instrument will stop a data transmission when an X-OFF signal is received from the host computer, and will resume transmission when the next X-ON signal is received. A CS signal from the host computer is ignored.

Reception Data Control

A software handshake status is established between the instrument and host computer. When the instruments reception buffer vacancy reaches 64 bytes, the X-OFF signal will be sent to the host computer. When the reception buffer vacancy reaches 192 bytes, the X-ON signal will be sent. RS = True (fixed).

CS-RS

Transmission Data Control

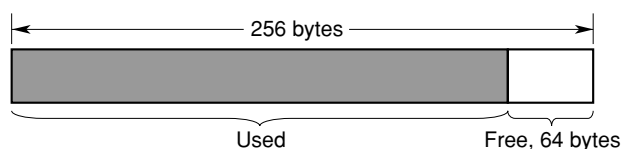
A software handshake status is established between the instrument and host computer. The instrument will stop a data transmission if a "CS = False" status is established, and will resume the transmission when a "CS = True" status is established. The X-OFF and X-ON signals from the host computer are processed as data.

Reception Data Control

A hardware handshake status is established between the instrument and host computer. When the instrument's reception buffer vacancy reaches 64 bytes, an "RS=False" status will be established. When the reception buffer vacancy reaches 192 bytes, an "RS=True" status will be established.

Precautions Regarding Data Receiving Control

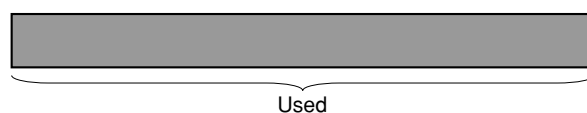
When handshaking is used to control the reception of data, data may still be sent from the computer even if the free space in the receive buffer drops below 64 bytes. In this case, after the receive buffer becomes full, the excess data will be lost, whether handshaking is in effect or not. Data storage to the buffer will begin again when there is free space in the buffer.



When handshaking is in use, reception of data will stop when the free space in the buffer drops to 64 bytes since data cannot be passed to the main program fast enough to keep up with the transmission.



After reception of data stops, data continues to be passed to the internal program. Reception of data starts again when the free space in the buffer increases to 192 bytes.



Whether handshaking is in use or not, if the buffer becomes full, any additional data received is no longer stored and is lost.

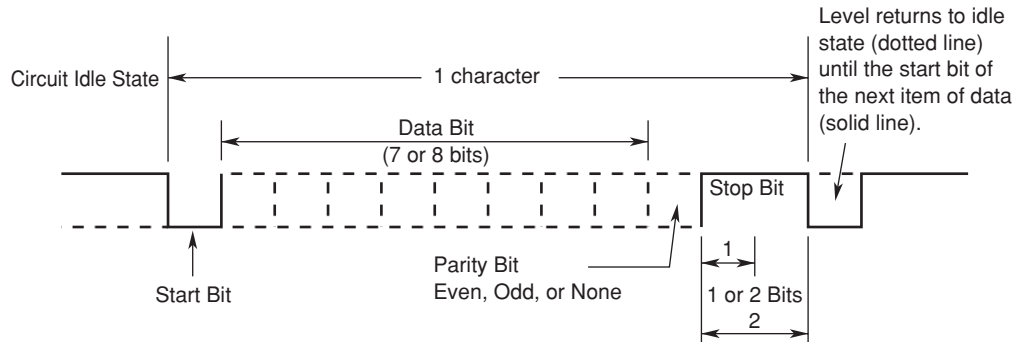
Data Receiving Control Using Handshaking

Note

It is necessary to create a host computer program which prevents the buffers of both the instrument and the computer from becoming full.

2.5 Matching the Data Format

The serial (RS-232) interface of this instrument performs communications using start-stop synchronization. In start-stop synchronization, one character is transmitted at a time. Each character consists of a start bit, data bits, a parity bit, and a stop bit. Refer to the figure below.



2.6 Setting up this Instrument (Serial)

Operating Procedure

Selecting the Communication Interface

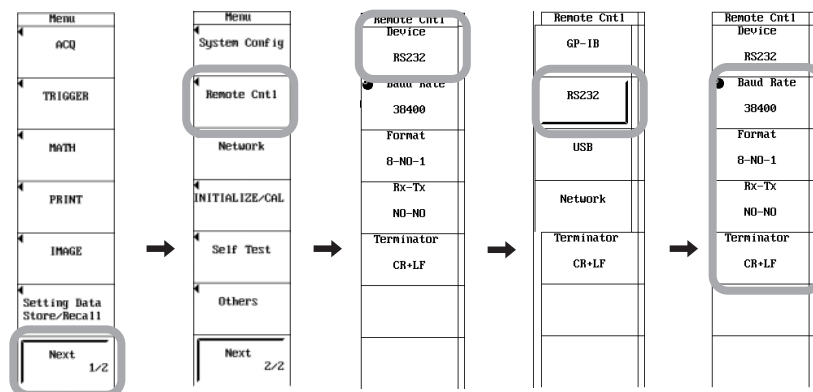
1. Press **MENU**.
2. Press the **Next 1/2** soft key.
3. Press the **Remote Cntl** soft key.
4. Press the **Device** soft key to select RS232.

Note

Only the communications interfaces selected under Device are available. If commands are sent using an unselected communications interface, the command will not be received.

Selecting the Baud Rate, the Data Format and etc.

4. Press the **Baud Rate (baud rate)**, **Format (data format)**, **Rx-Tx (handshaking method)**, and the **Terminator (terminator)** soft keys individually, and turn the **jog shuttle** to set each item.



Explanation

When using the controller to set the items which can be set locally using the keys on the instrument, or when outputting the setup data or the waveform data to the controller, set the following items.

Baud Rate

Select from the following choices.

1200, 2400, 4800, 9600, 19200, 38400, 57600

Data Format

Select the combination of the data length and the stop bit from the following choices.

8-NO-1, 7-EVEN-1, 7-ODD-1, 7-NO-2

Handshaking Method

Select the transmit data control and the receive data control from the following choices.

NO-NO, XON-XON, CTS-RTS

Terminator

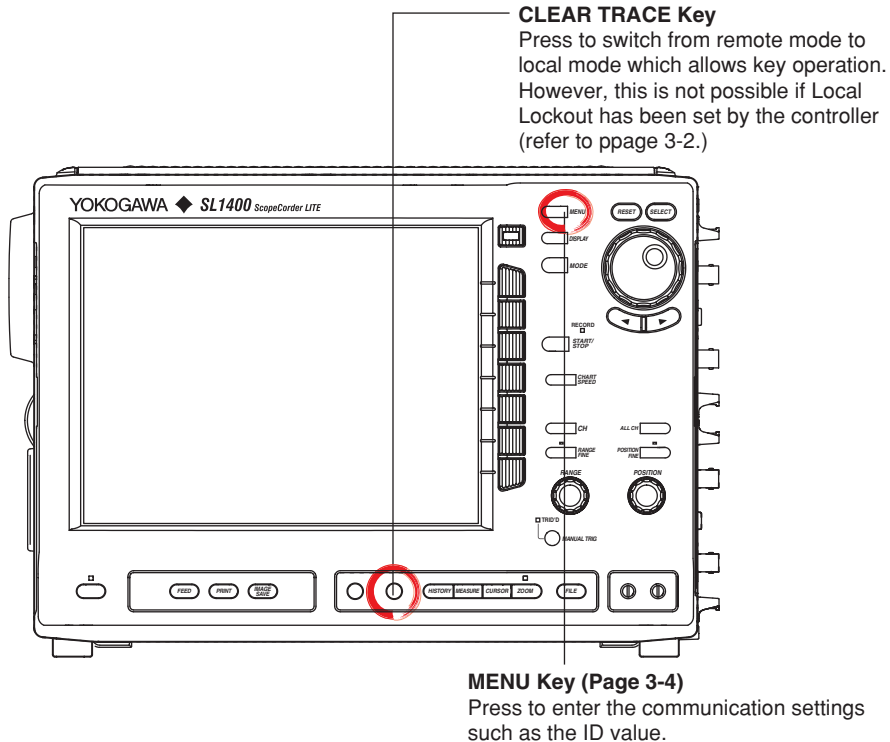
Select from the following choices. The terminator used when sending the data from this instrument is selected on the menu. Use either "LF" or "CR+LF" for the terminator in receiving the data.

CR, LF, CR+LF

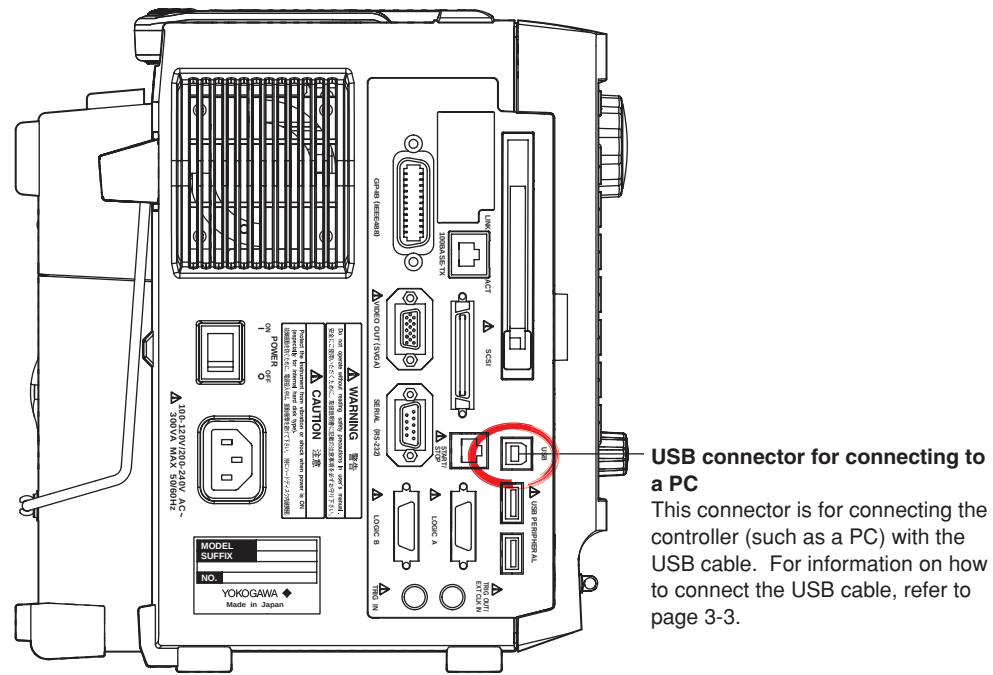
Chapter 3 USB Interface

3.1 Names of the Parts and their Function

Front Panel



Side Panel



3.2 USB Interface Functions and Specifications

Receiving Function

You can specify the same settings as those specified by front panel key operations.
Receives output requests for measured and computed data, setup data, and error codes.

Sending Function

Outputs measured and computed data.
Outputs setting parameters of the panel and the status byte.
Outputs error codes that are generated.

USB Interface Specifications

Electrical and Mechanical Specifications: Conforms to USB Rev.1.0
Connector: Type B connector (receptacle)
Number of Ports: 1
Power Supply: Self-powered
Supported Systems: PC system supported. Models with a standard USB port that operates on Windows 2000 or Windows XP (a separate device driver is required for connection to the PC).

Data Transfer Rate

The table below shows approximate response times for output of waveform data, assuming the following configuration.

Model: 701240
Controller: PC (Pentium4 2.0 GHz, USB1.1), OS (Windows 2000 Professional)
Programming Language: Visual C++

Data Volume	Byte Format	Word Format	ASCII Format
1000	approx. 29 ms	approx. 31 ms	approx. 479 ms
10000	approx. 47 ms	approx. 52 ms	approx. 4.5 s
100000	approx. 210 ms	approx. 330 ms	approx. 45.1 s
1000000	approx. 2.0 s	approx. 3.2 s	approx. 453 s

Switching between Remote and Local Mode

When Switching from Local to Remote Mode

If the SL1400 receives a ":COMMunicate:REMOte ON" command from the PC when it is in the local mode, it switches to the remote mode.

- REMOTE is displayed at the lower left corner of the screen.
- All keys except **CLEAR TRACE** are disabled.
- The settings that existed in the local mode are maintained even when the SL1400 switches to the remote mode.

When Switching from Remote to Local Mode

Pressing **CLEAR TRACE** when the instrument is in the remote mode causes the instrument to switch to the local mode. However, this is void when the SL1400 has received a ":COMMunicate:LOCKout ON" command from the PC (local lockout condition). When the SL1400 receives a ":COMMunicate:REMOte OFF" command from the PC, the SL1400 switches to the local mode regardless of the local lock condition.

- REMOTE indication at the lower right corner disappears.
- Key operations are enabled.
- The settings that existed in the remote mode are maintained even when the instrument switches to the local mode.

Note

The USB interface cannot be used simultaneously with other communications interface (GPIB, serial (RS-232), or network).

3.3 Connection via the USB Interface

Connection Precautions

- Connect the USB cable by inserting the connector firmly into the USB connector.
- When connecting multiple devices using USB hubs, connect the SL1400 to the USB hub that is closest to the controller.
- Do not mistakenly insert the USB cable to the START/STOP output terminal. This may cause damage to the SL1400.
- Do not connect or disconnect the USB cable after the power is turned ON until the SL1400 boots up completely (until the SL1400 is ready for operation, approximately 20 to 30 s). Doing so can cause damage to the SL1400.

3.4 Setting up this Instrument (USB)

Operating Procedure

Selecting the Communication Interface

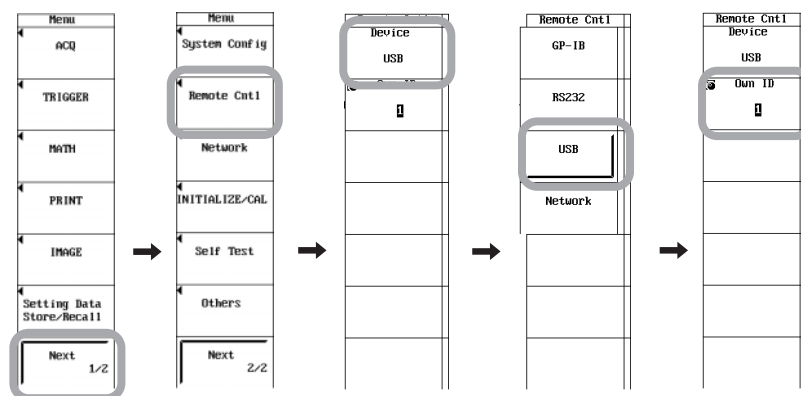
1. Press **MENU**.
2. Press the **Next 1/2** soft key.
3. Press the **Remote Cntl** soft key.
4. Press the **Device** soft key to select USB.

Note

Only the communications interfaces selected under Device are available. If commands are sent using an unselected communications interface, the command will not be received.

Setting the ID Value

4. Turn the **jog shuttle** to set the ID value.



Explanation

Carry out the following settings when using a controller to set information that can be specified through key operation on the SL1400 or when outputting setup data or output waveform data to the controller.

Setting the ID Value

Set the ID value of the SL1400 within the following range:

1 to 127

You can connect multiple devices to a controller using the USB interface. If multiple devices are connected in a single USB system, the ID value is used by the controller to identify each device. Therefore, unique ID values must be assigned to the devices within a single system.

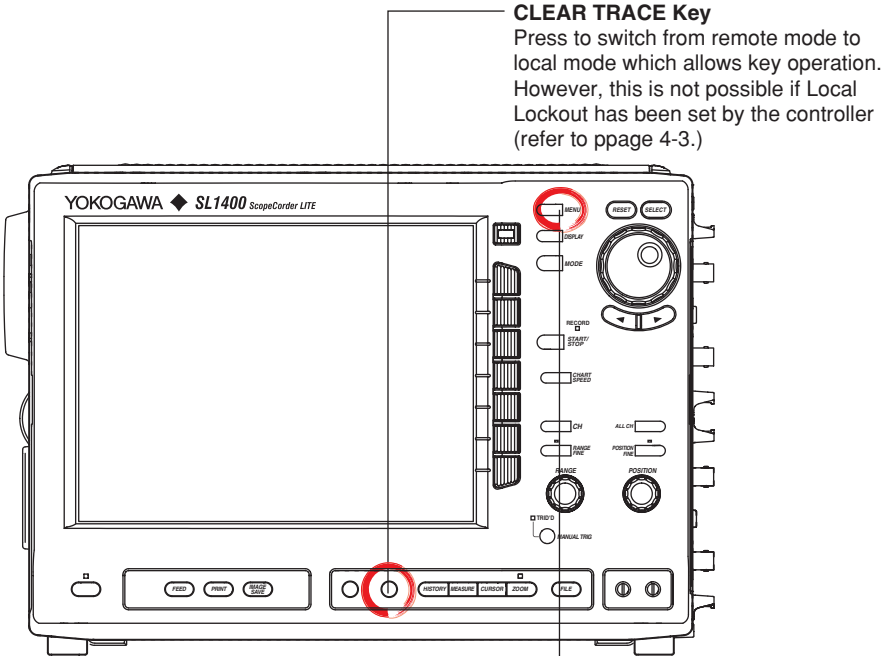
Note

Do not change the ID value while using the USB.

Chapter 4 Network Interface (Option)

4.1 Names of the Parts and their Function

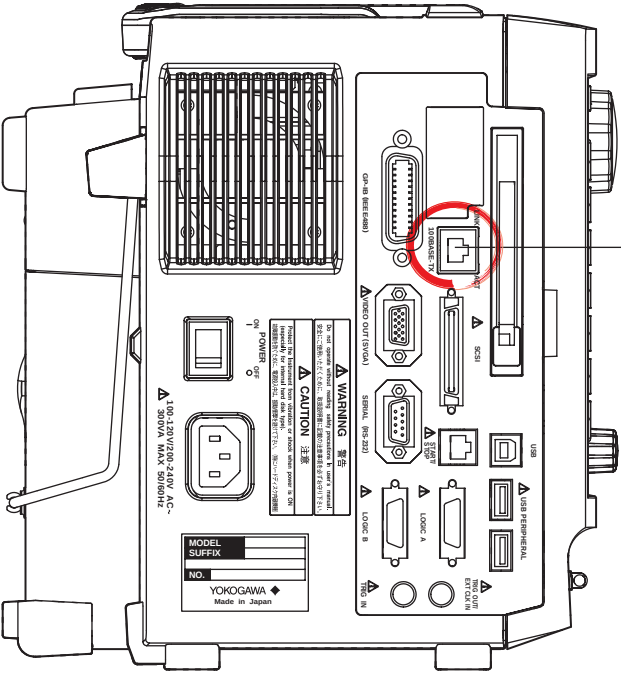
Front Panel



CLEAR TRACE Key
Press to switch from remote mode to local mode which allows key operation. However, this is not possible if Local Lockout has been set by the controller (refer to ppage 4-3.)

MENU Key (Page 4-5)
Press to enter the communication settings such as the user name and password.

Side Panel



Ethernet Port
This connector is for connecting the controller (such as a PC) with the Ethernet cable. For information on how to connect the USB cable, refer to page 4-4.

4.2 Network Interface Functions and Specifications

Receiving Function

It is possible to make the same settings via the RS-232 interface as can be made using the front panel keys.

Measured or computed data, setup data, and error codes can be received.

Sending Function

Measured/computed data can be output.

Setup data and the status byte can be output.

Error codes which have occurred can be output.

Network Interface Specifications

Communication Port Number:	1
Electrical and Mechanical Specifications:	IEEE802.3 Compliant
No. of simultaneous connections:	1
Transmission mode:	100BASE-TX/10BASE-T
Transmission rate:	Max. 100 Mbps
Communication protocol:	TCP/IP
Connector type:	RJ-45 connector
Port No.:	10001/tcp

Data Transfer Rate

The table below shows approximate response times for output of waveform data, assuming the following configuration.

Model:	701240
Controller:	EPSON Endeavor VZ-6000 (Pentium III, 733 MHz)
Network Adaptor:	Corega F Ether PCI-TXL
Programming Language:	Visual C++

Data Volume	Byte Format	Word Format	ASCII Format
1000	approx. 9 ms	approx. 9 ms	approx. 464 ms
10000	approx. 25 ms	approx. 31 ms	approx. 3.7 s
100000	approx. 195 ms	approx. 404 ms	approx. 36 s
1000000	approx. 1.9 s	approx. 2.5 s	approx. 380 s

Switching between Remote and Local Mode

When Switched from Local to Remote

Remote mode is activated when the ":COMMunicate:REMOte ON" command is received from a controller while local mode is active.

- REMOTE is displayed on the upper right of the screen.
- All front panel keys except **CLEAR TRACE** can no longer be operated.
- Settings entered in local mode are retained even when switching to remote mode.

When Switched from Remote to Local Mode

Pressing **CLEAR TRACE** in remote mode puts the instrument in local mode. However, this is not possible when the ":COMMunicate:REMOte ON" command is received from the controller while Local Lockout mode is active. Local mode is activated when the ":COMMunicate:REMOte OFF" command is received regardless of Local Lockout.

- The REMOTE indicator on the upper right of the screen is turned off.
- All front panel keys are operative.
- Settings entered in remote mode are retained even when switching to local mode.

Note

The network interface cannot be used simultaneously with other communications interfaces (GP-IB, serial (RS-232), or USB).

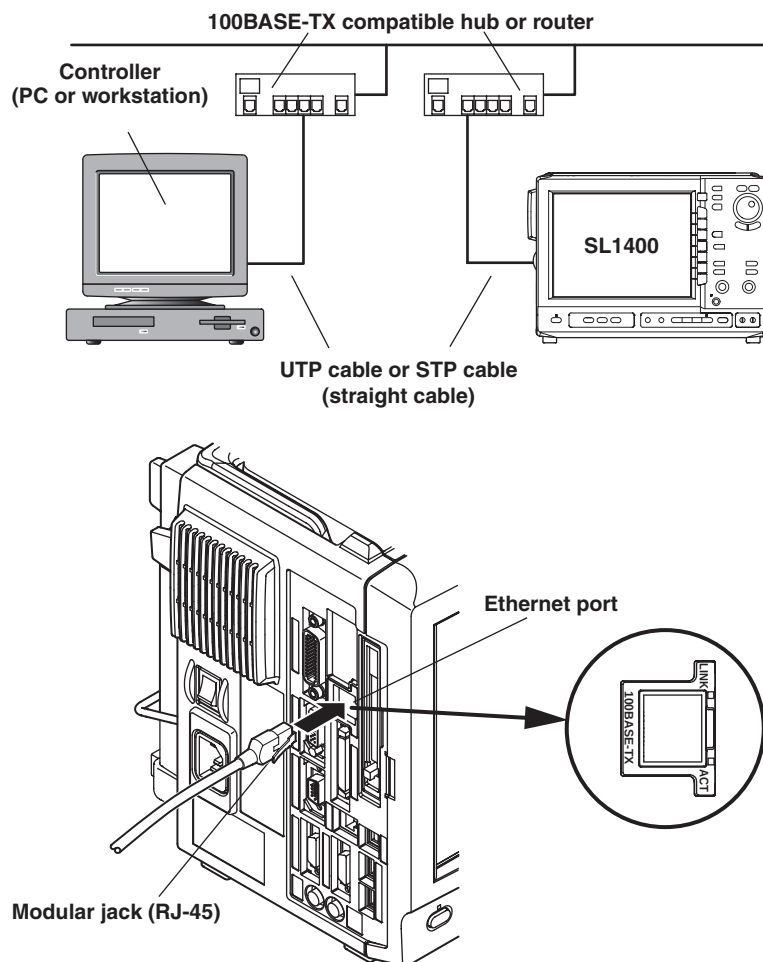
User Verification Function

The user must enter a user name and password for the interface when connecting to the network. The user name and password is set on the instrument in the Remote Cntl setting screen under the menu. For details, see section 4.4, "Setting up this Instrument (Network)."

4.3 Connection via the Network Interface

Connection Method

Connect a UTP (Unshielded Twisted-Pair) or STP (Shielded Twisted-Pair) cable that has been connected to a hub to the 100BASE-TX port on the rear panel of the unit.



Connection Precautions

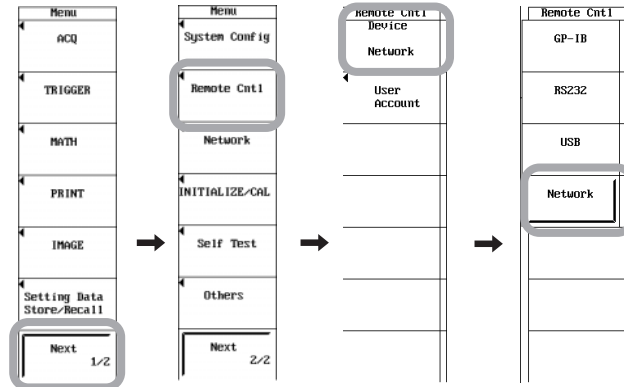
- You must use a straight cable when connecting the unit to a controller or a work station. We cannot guarantee results using a cross cable.
- When using a UTP cable (straight cable), be sure to use only a category 5 cable.

4.4 Setting up this Instrument (Network)

Operating Procedure

Selecting the Communication Interface

1. Press **MENU**.
2. Press the **Next 1/2** soft key.
3. Press the **Remote Cntl** soft key.
4. Press the **Device** soft key, and select Network.

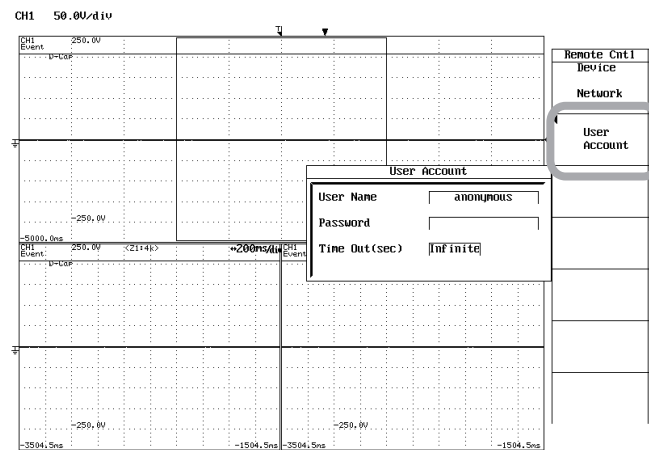


Note

Only the communications interfaces selected under Device are available. If commands are sent using an unselected communications interface, the command will not be received.

Setting the User Name, Password, and Timeout Time

4. The **User Account** dialog box opens. The User Account dialog box opens.
5. Use the **jog shuttle** to move the cursor to User Name, then press Select to display the keyboard.



4.4 Setting up this Instrument (Network)

6. Enter the user name. If you do not wish to limit access, use the anonymous setting. If access is to be limited, enter a user name of 15 characters or less.
7. Use the **jog shuttle** to move the cursor to Password, then press **SELECT** to display the keyboard.
8. Enter a password of 15 characters or less. Reenter the password to confirm.
9. Use the **jog shuttle** to move the cursor to Time Out, then press **SELECT** to display the keyboard.
10. Enter the Timeout time using the **jog shuttle**.

Note

- For (soft) keyboard operation, see section 4.2 in user's manual IM701240-01E.
 - The user name and password are case sensitive.
-

TCP/IP Settings

The following TCP/IP settings must be entered in order to use the network interface functions.

- IP Address
- Subnet Mask
- Default Gateway

For details about how to enter these settings, see section 15.2 in user's manual IM701240-01E.

Description

Use the settings below to setup communications so that you can input settings on the instrument using the controller, or output settings or values to the controller.

Setting the User Name and Password

There is a user verification function for the Network interface. The user name and password are set on the instrument ahead of time.

- **User Name Setting**
15 characters or less may be used. The default value is anonymous.
- **Password Setting**
15 characters or less may be used.

Setting the Timeout Time

If the unit is not being accessed at the specified timeout time, the connection to the network will be automatically closed.

TCP/IP Settings

For details, see section 15.2 in user's manual IM701240-01E.

Note

- If a user verification error occurs, the connection to the instrument is cut.
 - If the login name is anonymous, it is not necessary to enter a password.
 - When changing the user name, password, timeout time, or TCP/IP settings, the settings will not take effect until the unit is turned OFF then back ON again.
-

Chapter 5 Before Programming

5.1 Messages

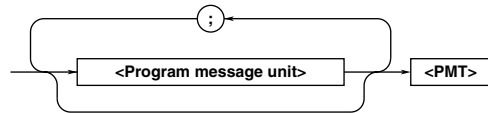
Messages

Blocks of message data are transferred between the controller and this instrument during communications. Messages sent from the controller to this instrument are called program messages, and messages sent back from this instrument to the controller are called response messages.

If a program message contains a query command, i.e. a command which requests a response, this instrument returns a response message. A single response message is always returned in reply to a program message.

Program Messages

The format of a program message is shown below.



<Program Message Unit>

A program message consists of one or more program message units; each unit corresponds to one command. This instrument executes commands one by one according to the order in which they are received.

Program message units are delimited by a "; ."

For a description of the format of the program message unit, refer to the explanation given further below.

Example :ACQUIRE:MODE NORMAL;COUNT 1<PMT>

Unit Unit

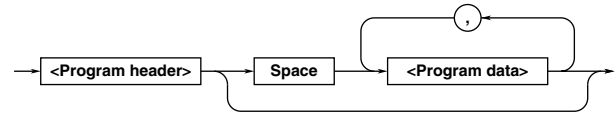
<PMT>

PMT is a terminator used to terminate each program message. The following three types of terminator are available.

- NL (New Line) : Same as LF (Line Feed). ASCII code "0AH" is used.
- ^END : END message defined in IEEE488.1. (EOI signal)
(The data byte sent with an END message will be the final item of the program message unit.)
- NL^END : NL with an END message attached (NL is not included in the program message unit.)

Program Message Unit Format

The format of a program message unit is shown below.



<Program Header>

A program header is used to indicate the command type. For details, refer to page 5-3.

<Program Data>

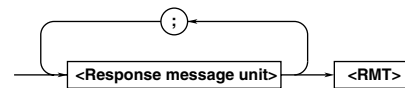
If certain conditions are required for the execution of a command, program data must be added. Program data must be separated from the header by a space (ASCII code "20H"). If multiple items of program data are included, they must be separated by a ", " (comma). For details, refer to page 5-5.

Example :ACQUIRE:MODE NORMAL<PMT>

Header Data

Response Messages

The format of a response message is shown below.



<Response Message Units>

A response message consists of one or more response message units: each response message unit corresponds to one response.

Response message units are delimited by a "; ."

For the response message format, refer to the next page.

Example :ACQUIRE:MODE NORMAL;COUNT 1<RMT>

Unit Unit

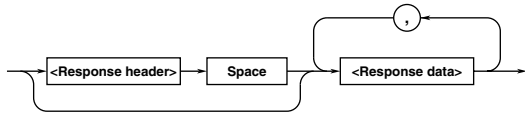
<RMT>

RMT is the terminator used for every response message. Only one type of response message is available; NL^END.

5.1 Messages

Response Message Unit Format

The format of a program message unit is shown below.



<Response Header>

A response header sometimes precedes the response data. Response data must be separated from the header by a space. For details, refer to page 5-4.

<Response Data>

Response data is used to define a response. If multiple items of response data are used, they must be separated by a ", " (comma). For details, refer to page 5-5.

Example

1.25E-02<RMT> :ACQUIRE:MODE NORMAL<RMT>
Data Header Data

If a program message contains more than one query, responses are made in the same order as the queries. Normally, each query returns only one response message unit, but there are some queries which return more than one response message unit. The first response message unit always responds to the first query, but it is not always true that the 'n' th unit always responds to the 'n' th query. Therefore, if you want to make sure that a response is made to each query, the program message must be divided up into individual messages.

Points to Note Concerning Message Transmission

- It is always possible to send a program message if the previous message which was sent did not contain any queries.
- If the previous message contained a query, it is not possible to send another program message until a response message has been received. An error will occur if a program message is sent before a response message has been received in its entirety. A response message which has not been received will be discarded.
- If an attempt is made by the controller to receive a response message, even if there is no response message, an error will occur. An error will also occur if the controller makes an attempt to receive a response message before transmission of a program message has been completed.
- If a program message of more than one unit is sent and some of the units are incomplete, this instrument receives program message units which the instrument thinks complete and attempts to execute them. However, these attempts may not always be successful and a response may not always be returned, even if the program message contains queries.

Dead Lock

This instrument has a buffer memory in which both program and response messages of 1024 bytes or more can be stored. (The number of bytes available will vary depending on the operating state of the instrument.) If both buffer memories become full at the same time, this instrument becomes inoperative. This state is called deadlock. In this case, operation can be resumed by discarding the response message. No dead lock will occur, if the size of the program message including the PMT is kept below 1024 bytes. Furthermore, no deadlock will occur if the program message does not contain a query.

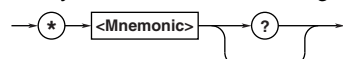
5.2 Commands

Commands

There are three types of command (program header) which can be sent from the controller to this instrument. They differ in the format of their program headers.

Common Command Header

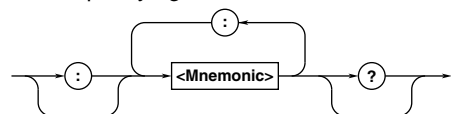
Commands defined in IEEE 488.2-1987 are called common commands. The header format of a common command is shown below. An asterisk (*) must always be attached to the beginning of a command.



An example of a common command
*CLS

Compound Header

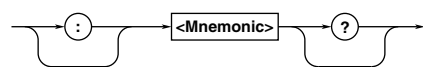
Commands designed to be used only with this instrument are classified and arranged in a hierarchy according to their function. The format of a compound header is illustrated below. A colon (:) must be used when specifying a lower-level header.



An example of a compound header
:ACQuire:MODE

Simple Header

These commands (headers) are functionally independent of each other and are not arranged hierarchically. The format of a simple header is shown below.



An example of a simple header
:START

Note

A mnemonic is a character string made up of alphanumeric characters.

When Concatenating Commands

Command Group

A command group is a group of commands which have the same compound header. A command group may contain sub-groups.

Example Commands relating to acquisition settings

```
:ACQuire:AVERAge:COUNT
:ACQuire:MODE
:ACQuire:AVERAge:EWEight
:ACQuire:CLOCK
:ACQuire:COUNT
```

When Concatenating Commands of the Same Group

This instrument stores the hierarchical level of the command which is currently being executed, and performs analysis on the assumption that the next command to be sent will also belong to the same level. Therefore, it is possible to omit the header if the commands belong to the same group.

Example:ACQuire:MODE NORMAL;COUNT 1<PMT>

When Concatenating Commands of Different Groups

A colon (:) must be included before the header of a command, if the command does not belong to the same group as the preceding command. It is impossible to omit a colon (:).

Example:ACQuire:MODE NORMAL;:DISPlay:
FORMAT SINGLE<PMT>

When Concatenating Simple Headers

When you type in a simple header after another command, you must include a colon (:) before the simple header. It is impossible to omit a colon (:).

Example:ACQuire:MODE NORMAL;:START<PMT>

When Concatenating Common Commands

Common commands defined in IEEE 488.2-1992 are independent of hierarchical level. Thus, it is not necessary to add a colon (:) before a common command.

Example:ACQuire:MODE NORMAL;*CLS;
COUNT 1<PMT>

When Separating Commands with <PMT>

If a terminator is used to separate two commands, each command is a separate message. Therefore, the common header must be typed in for each command even when commands of the same command group are being concatenated.

Example:ACQuire:MODE
NORMAL<PMT>;ACQuire:COUNT 1<PMT>

Upper-level Query

An upper-level query is a compound header to which a question mark is appended. Execution of an upper-level query allows all a group's settings to be output at once. Some query groups comprising more than three hierarchical levels can output all their lower level settings.

Example: `CHANnel1?<PMT> -> :CHANNEL1:
DISPLAY ON; LABEL "CH1 ";
COUPLING DC; POSITION 0.00;
PROBE 10; VDIV 50.0E+00;
BWIDTH FULL; OFFSET 0.0E+00; LSCALE:
MODE 0`

In reply to a query, a response can be returned as a program message to this instrument. Transmitting a response can restore the settings made when the query was executed. However, some upper-level queries will not return set-up data which is not currently in use. Note that not all a group's information will necessarily be sent out as a response.

Header Interpretation Rules

This instrument interprets the header received according to the following rules.

- Mnemonics are not case sensitive.
Example "CURSor" can also be written as "cursor" or "Cursor."
 - The lower-case part of a header can be omitted.
Example "CURSor" can also be written as "CURSO" or "CURS."
 - If the header ends with a question mark, the command is a query. It is not possible to omit the question mark.
Example "CURSor?" cannot be abbreviated to anything shorter than "CURS?."
 - If the "x" at the end of a mnemonic is omitted, it is assumed to be "1."
Example If "CHANnel<x>" is written as "CHAN," this represents "CHANnel1."
 - Any part of a command enclosed by [] can be omitted.
Example "TRIGger[:SIMPLle]:LEVel" can be written as "TRIG:LEV."
- However, a part enclosed by [] cannot be omitted if it is located at the end of an upper-level query.
Example "TRIGger?" and "TRIGger:SIMPLe?" belong to different upper-level query levels.

5.3 Response

Response

On receiving a query from the controller, this instrument returns a response message to the controller. A response message is sent in one of the following two forms.

- Response Consisting of a Header and Data
If the query can be used as a program message without any change, a command header is attached to the query, which is then returned.

Example :ACQuire:MODE?<PMT> ->
:ACQuire:MODE NORMAL<RMT>

- Response Consisting of Data Only
If the query cannot be used as a program message unless changes are made to it (i.e. it is a query-only command), no header is attached and only the data is returned. Some query-only commands can be returned after a header is attached to them.

Example :MEASure:CHANnel1:PTOPeak:
VALue?<PMT> -> 10.0E+00<RMT>

When Returning a Response without a Header

It is possible to remove the header from a response consisting of a header and data. The "COMMunicate:HEADer" command is used to do this.

Abbreviated Form

Normally, the lower-case part is removed from a response header before the response is returned to the controller. Naturally, the full form of the header can also be used. For this, the "COMMunicate:VERBose" command is used. The part enclosed by [] is also omitted in the abbreviated form.

5.4 Data

Data

A data section comes after the header. A space must be included between the header and the data. The data contains conditions and values. Data is classified as below.

Data	Description
<Decimal>	Value expressed as a decimal number (Example: Type of probe of CH2 -> CHANnel2:PROBe 100)
<Voltage><Current> <Time><Frequency>	Physical value (Example: Time axis range -> TIMEbase:TDiv 1US)
<Register>	Register value expressed as either binary, octal, decimal or hexadecimal (Example: Extended event register value -> STATUS:EESE #HFE)
<Character data>	Specified character string (mnemonic). Can be selected from { } (Example: CH2 input coupling -> CHANnel1:COUPling{AC DC GND})
<Boolean>	Indicates ON/OFF. Set to ON, OFF or value (Example: CH2 display ON -> CHANnel2:DISPlay ON)
<Character string data>	Arbitrary character string (Example: Comment on screen-data output -> HCOpy:COMMeNt "ABCDEF")
<Filename>	Gives the name of a file. (Example: Name of file to be saved -> FILE:SAVe:WAVEform:NAME "CASE1")
<Block data>	Arbitrary 8-bit data (Example: Response to acquired waveform data -> #800000010ABCDEFHJIJ)

<Decimal>

<Decimal> indicates a value expressed as a decimal number, as shown in the table below. Decimal values are given in the NR form specified in ANSI X3. 42-1975.

Symbol	Description	Example
<NR1>	Integer	125 -1 +1000
<NR2>	Fixed point number	125.0 -.90 +001.
<NR3>	Floating point number	125.0E+0 -9E-1 +.1E4
<NRf>	Any of the forms <NR1> to <NR3> is allowed.	

- Decimal values which are sent from the controller to this instrument can be sent in any of the forms to <NR3>. In this case, <NRf> appears.
- For response messages which are returned from this instrument to the controller, the form (<NR1> to <NR3> to be used) is determined by the query. The same form is used, irrespective of whether the value is large or small.
- In the case of <NR3>, the "+" after the "E" can be omitted, but the "-" cannot.
- If a value outside the setting range is entered, the value will be normalized so that it is just inside the range.
- If the value has more than the significant number of digits, the value will be rounded.

<Voltage>, <Current>, <Time>, <Frequency>

<Voltage>, <Current>, <Time>, and <Frequency> indicate decimal values which have physical significance. <Multiplier> or <Unit> can be attached to <NRf>. They can be entered in any of the following forms.

Form	Example
<NRf><Multiplier><Unit>	5MV
<NRf><Unit>	5E-3V
<NRf><Multiplier>	5M
<NRf>	5E-3

• <Multiplier>

Multipliers which can be used are shown below.

Symbol	Word	Description
EX	Exa	10 ¹⁸
PE	Peta	10 ¹⁵
T	Tera	10 ¹²
G	Giga	10 ⁹
MA	Mega	10 ⁶
K	Kilo	10 ³
M	Milli	10 ⁻³
U	Micro	10 ⁻⁶
N	Nano	10 ⁻⁹
P	Pico	10 ⁻¹²
F	Femto	10 ⁻¹⁵
A	Atto	10 ⁻¹⁸

• <Unit>

Units which can be used are shown below.

Symbol	Word	Description
V	Volt	Voltage
A	Ampere	Current
S	Second	Time
HZ	Hertz	Frequency
MHZ	Megahertz	Frequency

- <Multiplier> and <Unit> are not case sensitive.
- "U" is used to indicate "μ."
- "MA" is used for Mega (M) to distinguish it from milli, except for in the case of Megahertz, which is expressed as "MHZ." Hence, it is not permissible to use "M" (milli) for Hertz.
- If both <Multiplier> and <Unit> are omitted, the default unit will be used.
- Response messages are always expressed in <NR3> form. Neither <Multiplier> nor <Unit> is used, therefore the default unit is used.

<Register>

<Register> indicates an integer, and can be expressed in hexadecimal, octal, or binary as well as a decimal number. <Register> is used when each bit of a value has a particular meaning. <Register> is expressed in one of the following forms.

Form	Example
<NRf>	1
#H	#H0F
<Hexadecimal value made up of the digits 0 to 9, and A to F>	
#Q<Octal value made up of the digits 0 to 7>	#Q777
#B<Binary value made up of the digits 0 and 1>	#B001100

- <Register> is not case sensitive.
- Response messages are always expressed as <NR1>.

<Character data>

<Character data> is a specified string of character data (a mnemonic). It is mainly used to indicate options, and is chosen from the character strings given in { }. For interpretation rules, refer to "Header Interpretation Rules" on page 5-4.

Form	Example
{AC DC DC50 GND}	AC

- As with a header, the "COMMunicate:VERBoSe" command can be used to return a response message in its full form. Alternatively, the abbreviated form can be used.
- The "COMMunicate:HEADer" command does not affect <character data>.

<Boolean>

<Boolean> is data which indicates ON or OFF, and is expressed in one of the following forms.

Form	Example
{ON OFF <NRf>}	ON OFF 1 0

- When <Boolean> is expressed in <NRf> form, OFF is selected if the rounded integer value is "0" and ON is selected if the rounded integer is "Not 0."
- A response message is always "1" if the value is ON and "0" if it is OFF.

<Character string data>

<Character string data> is not a specified character string like <Character data>. It is an arbitrary character string. A character string must be enclosed in single quotation marks (') or double quotation marks (").

Form	Example
<Character string data>	'ABC' "IEEE488.2-1992"

- Response messages are always enclosed in double quotation marks.
- If a character string contains a double quotation mark ("), the double quotation mark will be replaced by two concatenated double quotation marks (""). This rule also applies to a single quotation mark within a character string.
- <Character string data> is an arbitrary character string, therefore this instrument assumes that the remaining program message units are part of the character string if no single (') or double quotation mark (") is encountered. As a result, no error will be detected if a quotation mark is omitted.

<Filename>

Gives the name of a file. The format is as follows.

Form	Example
{<NRf> <Character data> <Character string>}	1 CASE "CASE"

- If you input an <NRf> value, the system converts the value (after rounding to the nearest integer) to the corresponding 8-character ASCII string. (If you set the value to 1, the name becomes "00000001".) Note that negative values are not allowed.
- If you enter a <character data> argument that is longer than eight characters, only the first twelve characters are used.
- If you enter a <character data> or <character string> argument that is longer than eight characters, only the first sixteen characters are used.
- Response messages always return filenames as <character string> arguments.

<Block data>

<Block data> is arbitrary 8-bit data. <Block data> is only used for response messages. Response messages are expressed in the following form.

Form	Example
#N <N-digit decimal value><Data byte string>	#800000010ABCDEFGHIJ

- #N
Indicates that the data is <Block data>. "N" is an ASCII character string number (digits) which indicates the number of data bytes that follow.
- <N-digits decimal value>
Indicates the number of bytes of data. (Example: 00000010=10 bytes)
- <Data byte string>
The actual data. (Example: ABCDEFGHIJ)
- Data is comprised of 8-bit values (0 to 255). This means that the ASCII code "0AH," which stands for "NL," can also be a code used for data. Hence, care must be taken when programming the controller.

5.5 Synchronization with the Controller

Overlap Commands and Sequential Commands

There are two kinds of command; overlap commands and sequential commands. Execution of an overlap command may start before execution of the previously sent command is completed.

The "CHANnel1:VDIV" command, for example, is a sequential command. Assume that you set a new V/div value and immediately request return of the new value, as follows:

```
:CHANnel1:VDIV 5V;VIDV?<PMT>
```

In this case, the oscilloscope always returns the newest setting ("5V"). This is because it always completes processing of the current sequential command (in this case, "VDIV 5V") before moving on to the next command ("VIDV?").

In contrast, assume that you begin a file load and then immediately query the V/div value:

```
:FILE:LOAD:SETup:EXECute "CASE1";:  
CHANnel1:VDIV?
```

Because "FILE:LOAD:SETup:EXECute "CASE1"" is an overlapped command, the oscilloscope will advance to the "CHANnel1:VDIV?" command before it finishes the load. The returned V/div value will not show the newest setting, but will rather show the setting in use before the setup was changed. Obviously, use of overlapped commands may in some cases produce inappropriate results. Where necessary, you can avoid such problems as described below.

Synchronization with an Overlap Command

Using the *WAI Command

The *WAI command causes the commands which follow it to wait until an overlap command has been executed.

```
Example:COMMunicate:OPSE #0040;:FILE:  
LOAD:SETup:EXECute "CASE1";*WAI;:  
CHANnel1:VDIV?<PMT>
```

The "COMMunicate:OPSE" command is used to designate which commands are to be subject to the *WAI command. In the above example, only auto set-up is designated.

Since a *WAI command is executed just before "CHANnel1:VDIV?", "CHANnel1:VDIV?" will not be executed until auto set-up has been completed.

5.5 Synchronization with the Controller

Using the COMMunicate:OVERlap Command

The "COMMunicate:OVERlap" command is used to enable or disable overlap operation.

Example: COMMunicate:OVERlap #HFFBF;:FILE:
LOAD:SETup:EXECute "CASE1";:
CHANnel1:VDIV:VALue?<PMT>

The "COMMunicate:OVERlap #HFFBF" command disables overlapped operation of the medium access command, while enabling all other overlap-type operations. The oscilloscope will therefore handle "FILE:LOAD:SETup:EXECute "CASE1"" as sequential command, ensuring that the "CHANnel1:VDIV?" command (in the above example) will not execute until file loading is completed.

Using the *OPC Command

The *OPC command causes the OPC bit (bit 0) of the standard event register (page 7-3) to be set to "1" when an overlap operation has been completed.

Example: COMMunicate:OPSE #H0040;*ESE 1;
*ESR?;*SRE 32;:FILE:LOAD:SETup:
EXECute "CASE1";*OPC<PMT>
(Response to *ESR? is decoded.)
(Service request is awaited.)
CHANnel1:VDIV?<PMT>

The "COMMunicate:OPSE" command is used to designate which commands are to be subject to the *OPC command. In the above example, only medium access commands are designated.

*ESE 1 and *SRE 32 stipulate that a service request is generated only when the OPC bit is set to "1." *ESR? is used to clear the standard event register. In the above example, "CHANnel1:VDIV?" will not be executed until a service request is generated.

Using the *OPC? Query

The *OPC? query generates a response when an overlap operation has been completed.

Example: COMMunicate:OPSE #H0040;:FILE:
LOAD:SETup:EXECute "CASE1";
*OPC?<PMT>
(Response to *OPC? is decoded.)
:CHANnel1:VDIV?<PMT>

The "COMMunicate:OPSE" command is used to designate which commands are to be subject to the *OPC? command. In the above example, only medium access commands are designated.

Since *OPC? does not generate a response until an overlap operation is completed, file loading will have been completed when a response to *OPC? is read.

Note

Most commands are sequential commands. Commands used in Chapter 6 are sequential commands unless otherwise specified.

Synchronization with Non-Overlap Commands

Synchronization is sometimes required for reasons other than communications-related reasons, such as the activation of a trigger, even if a sequential command is used.

For example, if a "next program" message is transmitted to make an inquiry about the waveform data which has been acquired using single mode as the trigger mode, the "WAVEform:SEND?" command is sometimes executed whether acquisition has been completed or not, causing a command execution error.

:TRIGger:MODE SINGLE;:START;:WAVEform:
SEND?<PMT>

In this case, synchronization with the time at which acquisition is completed must be accomplished, as shown next.

Using STATus:CONDition? Query

A "STATus:CONDition?" query is used to make an query about the contents of the condition register (page 7-4). It is possible to judge whether acquisition is in progress or not by reading bit 0 of the condition register. Bit 0 is "1" if acquisition is in progress, and "0" if acquisition is stopped.

Example: TRIGger:MODE SINGLE;:START<PMT>
:STATus:CONDition?<PMT>
(Returns to the previous status if bit 0 is found to be "1" when the response is decoded.)
:WAVEform:SEND?<PMT>

A "WAVEform:SEND?" query will not be executed until bit 0 of the condition register has been set to "0."

Using the Extended Event Register

Changes in the condition register are reflected in the extended event register (page 7-4).

Example: `STATUS:FILTER1 FALL;:STATUS:EESE 1;EESR?;*SRE 8;:TRIGGER:MODE SINGLE;:START<PMT>`
 (Response to "STATUS:EESR?" is decoded.)
 (Service request is awaited.)
`:WAVEFORM:SEND?<PMT>`

The "STATUS:FILTER1 FALL" command sets the transition filter such that Bit 0 (FILTER1) of the Extended Event Register sets to 1 when Bit 0 of the Condition Register changes from 1 to 0.

"STATUS:EESE 1" is a command used only to reflect the status of bit 0 of the extended event register in the status byte.

"STATUS:EESR?" is used to clear the extended event register.

The *SRE command is used to generate a service request caused solely by the extended event register.

"WAVEFORM:SEND?" will not be executed until a service request is generated.

Using the COMMunicate:WAIT Command

The "COMMunicate:WAIT" command halts communications until a specific event is generated.

Example: `STATUS:FILTER1 FALL;:STATUS:EESR?;:TRIGGER:MODE SINGLE;:START<PMT>`
 (Response to "STATUS:EESR?" is decoded.)
`:COMMunicate:WAIT 1;:WAVEFORM:SEND?<PMT>`

For a description of "STATUS:FILTER1 FALL" and "STATUS:EESR?", refer to "Using the extended event register" on this page.

"COMMunicate:WAIT 1" means that communications is halted until bit 0 of the extended event register is set to "1."

Chapter 6 Commands

6.1 A List of Commands

Command	Function	Page
ACQuire Group		
:ACQuire?	Queries all settings related to the waveform acquisition.	6-19
:ACQuire:AVERage?	Queries all settings related to averaging.	6-19
:ACQuire:AVERage:COUNT	Sets the waveform acquisition count or queries the current setting.	6-19
:ACQuire:AVERage:EWEight	Sets the attenuation constant of exponential averaging or queries the current setting.	6-19
:ACQuire:CLOCK	Sets the time base or queries the current setting.	6-19
:ACQuire:COUNT	Sets the waveform acquisition count when not in average mode or queries the current setting.	6-19
:ACQuire:MODE	Sets the waveform acquisition mode or queries the current setting.	6-19
:ACQuire:PROTate	Sets pulse/rotate when applying external clock or queries the current setting.	6-19
:ACQuire:RTOut?	Queries all settings related to realtime recording.	6-19
:ACQuire:RTOut:ANAMing	Sets auto naming for realtime recording or queries the current setting.	6-19
:ACQuire:RTOut:COMMENT	Sets the comment for realtime recording or queries the current setting.	6-19
:ACQuire:RTOut:COUNT	Sets the number of times to perform realtime recording or queries the current setting.	6-19
:ACQuire:RTOut:FILENAME	Sets the file name of auto naming of realtime recording or queries the current setting.	6-20
:ACQuire:RTOut:MODE	Sets whether to perform realtime recording or queries the current setting.	6-20
:ACQuire:RTOut:SEQUence	Sets the realtime recording operation or queries the current setting.	6-20
ASETup Group		
:ASETup?	Queries all settings related to auto setup.	6-20
:ASETup:EXECute	Executes auto setup.	6-20
:ASETup:TARGET	Sets the target channel for auto setup or queries the current setting.	6-20
:ASETup:UNDO	Cancels auto setup.	6-20
CALibrate Group		
:CALibrate?	Queries all settings related to the calibration.	6-21
:CALibrate[:EXECute]	Executes the calibration.	6-21
:CALibrate:MODE	Sets whether to perform auto calibration or queries the current setting.	6-21
CHANnel Group		
:CHANnel<x>?	Queries all settings related to the vertical axis of the channel.	6-29
:CHANnel<x>:ACCL?	Queries all settings related to the acceleration/voltage module.	6-29
:CHANnel<x>:ACCL:BIAS	Turns ON/OFF the bias current supply to the acceleration sensor when the acceleration/voltage module is installed or queries the current setting.	6-29
:CHANnel<x>:ACCL:BWIDth	Sets the bandwidth limit when the acceleration/voltage module is installed or queries the current setting.	6-29
:CHANnel<x>:ACCL:COUPling	Sets the input coupling when the acceleration/voltage module is installed or queries the current setting.	6-29
:CHANnel<x>:ACCL:GAIN	Sets the gain when the acceleration/voltage module is installed or queries the current setting.	6-29
:CHANnel<x>:ACCL:SCALE	Sets the upper and lower limits on the screen when the acceleration/voltage module is installed or queries the current setting.	6-29
:CHANnel<x>:ACCL:SENSitivity	Sets the sensitivity when the acceleration/voltage module is installed or queries the current setting.	6-29
:CHANnel<x>:ACCL:UNIT	Sets the unit when the acceleration/voltage module is installed or queries the current setting.	6-30
:CHANnel<x>:ACCL:VARIABLE	Sets the variable when the acceleration/voltage module is installed or queries the current setting.	6-30
:CHANnel<x>:ACCL:ZOOM	Sets the vertical zoom rate when the acceleration/voltage module is installed or queries the current setting.	6-30
:CHANnel<x>:DISPlay	Turns ON/OFF the waveform display of the channel or queries the current setting.	6-30
:CHANnel<x>:FREQ?	Queries all settings related to the frequency module.	6-30
:CHANnel<x>:FREQ:INPut	Queries all settings related to the input when the frequency module is installed.	6-30
:CHANnel<x>:FREQ:INPut:BWIDth	Sets the bandwidth limit when the frequency module is installed or queries the current setting.	6-30

6.1 A List of Commands

Command	Function	Page
:CHANnel<x>:FREQ:INPut:CELImination	Sets the chatter elimination when the frequency module is installed or queries the current setting.	6-31
:CHANnel<x>:FREQ:INPut:COUPling	Sets the input coupling when the frequency module is installed or queries the current setting.	6-31
:CHANnel<x>:FREQ:INPut:HYSTeresis	Sets the hysteresis when the frequency module is installed or queries the current setting.	6-31
:CHANnel<x>:FREQ:INPut:PRESet	Sets the preset when the frequency module is installed or queries the current setting.	6-31
:CHANnel<x>:FREQ:INPut:PROBe	Sets the probe attenuation when the frequency module is installed or queries the current setting.	6-31
:CHANnel<x>:FREQ:INPut:PULLup	Turns ON/OFF the pull-up when the frequency module is installed or queries the current setting.	6-31
:CHANnel<x>:FREQ:INPut:SLOPe	Sets the slope when the frequency module is installed or queries the current setting.	6-31
:CHANnel<x>:FREQ:INPut:THReshold	Sets the threshold level when the frequency module is installed or queries the current setting.	6-31
:CHANnel<x>:FREQ:INPut:VRANGE	Sets the voltage range when the frequency module is installed or queries the current setting.	6-32
:CHANnel<x>:FREQ:LSCale?	Queries all settings related to linear scaling when the frequency module is installed.	6-32
:CHANnel<x>:FREQ:LSCale:AVALue	Sets scaling coefficient A when the frequency module is installed or queries the current setting.	6-32
:CHANnel<x>:FREQ:LSCale:BVALue	Sets offset B when the frequency module is installed or queries the current setting.	6-32
:CHANnel<x>:FREQ:LSCale:GETMeasure	Executes the measurement of the P1:X P2:X values of linear scaling when the frequency module is installed.	6-32
:CHANnel<x>:FREQ:LSCale:MODE	Sets linear scaling when the frequency module is installed or queries the current setting.	6-32
:CHANnel<x>:FREQ:LSCale:{P1X P1Y P2X P2Y}	Sets the P1:X P1:Y P2:X P2:Y values when the frequency module is installed or queries the current setting.	6-32
:CHANnel<x>:FREQ:LSCale:UNIT	Sets the unit to be added to the result of linear scaling when the frequency module is installed or queries the current setting.	6-32
:CHANnel<x>:FREQ:OFFSet	Sets offset value when the frequency module is installed or queries the current setting.	6-33
:CHANnel<x>:FREQ:POSition	Sets the vertical position when the frequency module is installed or queries the current setting.	6-33
:CHANnel<x>:FREQ:SCALE	Sets the upper and lower limits when the frequency module is installed or queries the current setting.	6-33
:CHANnel<x>:FREQ:SETup?	Queries all settings related to FV setup when the frequency module is installed.	6-33
:CHANnel<x>:FREQ:SETup:CFrequency	Sets the center frequency when the frequency module is installed or queries the current setting.	6-33
:CHANnel<x>:FREQ:SETup:DECeleration	Turns ON/OFF the deceleration prediction when the frequency module is installed or queries the current setting.	6-33
:CHANnel<x>:FREQ:SETup:DPULse	Sets the distance per pulse when the frequency module is installed or queries the current setting.	6-33
:CHANnel<x>:FREQ:SETup:FILTer?	Queries all settings related to the filter when the frequency module is installed.	6-33
:CHANnel<x>:FREQ:SETup:FILTer:SMOothing?	Queries all settings related to smoothing when the frequency module is installed.	6-34
:CHANnel<x>:FREQ:SETup:FILTer:SMOothing:MODE	Turns ON/OFF smoothing when the frequency module is installed or queries the current setting.	6-34
:CHANnel<x>:FREQ:SETup:FILTer:SMOothing:VALue	Sets the moving average order of smoothing when the frequency module is installed or queries the current setting.	6-34
:CHANnel<x>:FREQ:SETup:FILTer:PAVerage?	Queries all settings related to pulse average when the frequency module is installed.	6-34
:CHANnel<x>:FREQ:SETup:FILTer:PAVerage:MODE	Turns ON/OFF pulse average when the frequency module is installed or queries the current setting.	6-34

Command	Function	Page
:CHANnel<x>:FREQ:SETup:FILTer:PAverage:VALue	Sets the number of times to perform pulse average when the frequency module is installed or queries the current setting.	6-34
:CHANnel<x>:FREQ:SETup:FUNCTion	Sets the measurement mode when the frequency module is installed or queries the current setting.	6-34
:CHANnel<x>:FREQ:SETup:LRESet	Sets the over-range reset when the frequency module is installed or queries the current setting.	6-35
:CHANnel<x>:FREQ:SETup:MPULse	Sets the measurement pulse when the frequency module is installed or queries the current setting.	6-35
:CHANnel<x>:FREQ:SETup:PROTate	Sets the number of pulses per rotation when the frequency module is installed or queries the current setting.	6-35
:CHANnel<x>:FREQ:SETup:RESet	Executes pulse count reset when the frequency module is installed.	6-35
:CHANnel<x>:FREQ:SETup:STOPpredict	Turns ON/OFF the stop prediction when the frequency module is installed or queries the current setting.	6-35
:CHANnel<x>:FREQ:SETup:TUNit	Sets the time unit when the frequency module is installed or queries the current setting.	6-35
:CHANnel<x>:FREQ:SETup:UNIT	Sets the unit of pulse integration when the frequency module is installed or queries the current setting.	6-35
:CHANnel<x>:FREQ:SETup:UPULse	Sets the unit/pulse when the frequency module is installed or queries the current setting.	6-35
:CHANnel<x>:FREQ:SETup:VUNit	Sets the unit of velocity when the frequency module is installed or queries the current setting.	6-36
:CHANnel<x>:FREQ:VARIABLE	Sets the variable when the frequency module is installed or queries the current setting.	6-36
:CHANnel<x>:FREQ:VDIV	Sets Value/Div when the frequency module is installed or queries the current setting.	6-36
:CHANnel<x>:FREQ:ZOOM	Sets the vertical zoom rate when the frequency module is installed or queries the current setting.	6-36
:CHANnel<x>:LABel	Sets the waveform label of the channel or queries the current setting.	6-36
:CHANnel<x>:MODULE?	Queries the installed modules.	6-36
:CHANnel<x>:STRain?	Queries all settings related to the strain module. ¹	6-36
:CHANnel<x>:STRain:BALance?	Queries all settings related to the balance when the strain module ¹ is installed.	6-37
:CHANnel<x>:STRain:BALance:CHANnel<x>	Sets the channel on which to execute the balance when the strain module ¹ is installed or queries the current setting.	6-37
:CHANnel<x>:STRain:BALance:EXECute	Executes the balance when the strain module ¹ is installed.	6-37
:CHANnel<x>:STRain:BWIDth	Sets the filter when the strain module ¹ is installed or queries the current setting.	6-37
:CHANnel<x>:STRain:EXCitation	Sets the bridge voltage when the strain module ¹ is installed or queries the current setting.	6-37
:CHANnel<x>:STRain:GFACTOR	Sets the gauge factor when the strain module ¹ is installed or queries the current setting.	6-37
:CHANnel<x>:STRain:INVert	Sets whether to invert the waveform when the strain module is installed or queries the current setting.	6-37
:CHANnel<x>:STRain:LSCale?	Queries all settings related to linear scaling of the channel when the strain module ¹ is installed.	6-37
:CHANnel<x>:STRain:LSCale:AVALue	Sets scaling coefficient A when the strain module ¹ is installed or queries the current setting.	6-38
:CHANnel<x>:STRain:LSCale:BVALue	Sets offset B when the strain module ¹ is installed or queries the current setting.	6-38
:CHANnel<x>:STRain:LSCale:DISPlaytype?	Queries all settings related to the display type when using linear scaling.	6-38
:CHANnel<x>:STRain:LSCale:DISPlaytype:MODE	Sets the display mode when using linear scaling or queries the current setting.	6-38
:CHANnel<x>:STRain:LSCale:DISPlaytype:DECimalnum	Sets the decimal place when the display type is Float when using linear scaling or queries the current setting.	6-38
:CHANnel<x>:STRain:LSCale:DISPlaytype:SUBunit	Sets the sub unit when the display type is Float when using linear scaling or queries the current setting.	6-38
:CHANnel<x>:STRain:LSCale:GETMeasure	Executes the measurement of the P1:X P2:X values of linear scaling when the strain module ¹ is installed.	6-38

6.1 A List of Commands

Command	Function	Page
:CHANnel<x>:STRain:LSCale:MODE	Turns ON/OFF linear scaling when the strain module ¹ is installed (SHUNT can be specified only on the Strain Module (DSUB, Shunt-Cal)) or queries the current setting.	6-38
:CHANnel<x>:STRain:LSCale:{P1X P1Y P2X P2Y}	Sets the P1:X P1:Y P2:X P2:Y values of linear scaling when the strain module ¹ is installed or queries the current setting.	6-39
:CHANnel<x>:STRain:LSCale:SHUNT	Executes the shunt calibration when the strain module ¹ is installed (only on the Strain Module (DSUB, Shunt-Cal)).	6-39
:CHANnel<x>:STRain:LSCale:UNIT	Sets the unit to be added to the result of linear scaling when the strain module ¹ is installed or queries the current setting.	6-39
:CHANnel<x>:STRain:RANGE	Sets the measurement range when the strain module ¹ is installed or queries the current setting.	6-39
:CHANnel<x>:STRain:SCALE	Sets the upper and lower limits on the screen when the strain module ¹ is installed or queries the current setting.	6-39
:CHANnel<x>:STRain:UNIT	Sets the unit when the strain module ¹ is installed or queries the current setting.	6-39
:CHANnel<x>:TEMPerature?	Queries all settings related to the Temperature, High Precision Voltage Isolation Module.	6-39
:CHANnel<x>:TEMPerature:BURNout	Sets whether to detect burnouts when the Temperature, High Precision Voltage Isolation Module is installed or queries the current setting.	6-39
:CHANnel<x>:TEMPerature:BWIDth	Sets the filter when the Temperature, High Precision Voltage Isolation Module is installed or queries the current setting.	6-40
:CHANnel<x>:TEMPerature:COUPling	Sets the input coupling when the Temperature, High Precision Voltage Isolation Module is installed or queries the current setting.	6-40
:CHANnel<x>:TEMPerature:RJC	Sets the RJC when the Temperature, High Precision Voltage Isolation Module is installed or queries the current setting.	6-40
:CHANnel<x>:TEMPerature:SCALE	Sets the upper and lower limits on the screen when the Temperature, High Precision Voltage Isolation Module is installed or queries the current setting.	6-40
:CHANnel<x>:TEMPerature:TYPE	Sets the thermocouple to be used when the Temperature, High Precision Voltage Isolation Module is installed or queries the current setting.	6-40
:CHANnel<x>:TEMPerature:UNIT	Sets the unit of the upper and lower limits when the Temperature, High Precision Voltage Isolation Module is installed or queries the current setting.	6-40
:CHANnel<x>:UNIT?	Queries the unit added to the channel.	6-40
:CHANnel<x>:VOLTag?	Queries all settings related to the voltage module. ²	6-40
:CHANnel<x>[:VOLTag]:BWIDth	Sets the bandwidth limit when the voltage module ² is installed or queries the current setting.	6-41
:CHANnel<x>[:VOLTag]:COUPling	Sets the input coupling when the voltage module ² is installed or queries the current setting.	6-41
:CHANnel<x>[:VOLTag]:INVert	Sets whether to invert the waveform when the voltage module ² is installed or queries the current setting.	6-41
:CHANnel<x>[:VOLTag]:LSCale?	Queries all settings related to linear scaling when the voltage module ² is installed.	6-41
:CHANnel<x>[:VOLTag]:LSCale:AVALue	Sets scaling coefficient A when the voltage module ² is installed or queries the current setting.	6-41
:CHANnel<x>[:VOLTag]:LSCale:BVALue	Sets offset B when the voltage module ² is installed or queries the current setting.	6-41
:CHANnel<x>[:VOLTag]:LSCale:DISPlaytype?	Queries all settings related to the display type when using linear scaling.	6-41
:CHANnel<x>[:VOLTag]:LSCale:DISPlaytype:MODE	Sets the display mode when using linear scaling or queries the current setting.	6-42
:CHANnel<x>[:VOLTag]:LSCale:DISPlaytype:DECimalnum	Sets the decimal place when the display type is Float when using linear scaling or queries the current setting.	6-42
:CHANnel<x>[:VOLTag]:LSCale:DISPlaytype:SUBunit	Sets the sub unit when the display type is Float when using linear scaling or queries the current setting.	6-42
:CHANnel<x>[:VOLTag]:LSCale:GETMeasure	Executes the measurement of the P1:X P2:X values of linear scaling when the voltage module ² is installed.	6-42
:CHANnel<x>[:VOLTag]:LSCale:MODE	Sets linear scaling when the voltage module ² is installed or queries the current setting.	6-42
:CHANnel<x>[:VOLTag]:LSCale:{P1X P1Y P2X P2Y}	Sets the P1:X P1:Y P2:X P2:Y values of linear scaling when the voltage module ² is installed or queries the current setting.	6-42

Command	Function	Page
:CHANnel<x>[:VOLTage]:LScale:UNIT	Sets the unit to be added to the result of linear scaling when the voltage module ² is installed or queries the current setting.	6-42
:CHANnel<x>[:VOLTage]:POSition	Sets the vertical position when the voltage module ² is installed or queries the current setting.	6-43
:CHANnel<x>[:VOLTage]:PROBe	Sets the probe attenuation when the voltage module ² is installed or queries the current setting.	6-43
:CHANnel<x>[:VOLTage]:SCALe	Sets the upper and lower limits on the screen when the voltage module ² is installed or queries the current setting.	6-43
:CHANnel<x>[:VOLTage]:VARIABLE	Sets the variable when the voltage module ² is installed or queries the current setting.	6-43
:CHANnel<x>[:VOLTage]:VDIV	Sets V/div when the voltage module ² is installed or queries the current setting.	6-43
:CHANnel<x>[:VOLTage]:ZOOM	Sets the vertical zoom rate when the voltage module ² is installed or queries the current setting.	6-43
1 Strain module refers to the Strain Module (NDIS) and the Strain Module (DSUB, Shunt-Cal).		
2 Voltage module refers to the High-Speed 10 MS/s, 12-Bit Isolation Module; the High-Speed High-Resolution 1 MS/s, 16-Bit Isolation Module; the High-Speed 10 MS/s, 12-Bit Non-Isolation Module; and the High-Voltage 100kS/s, 16-Bit Isolation Module (with RMS).		
CLEAr Group		
:CLEAr	Executes clear trace.	6-44
COMMunicate Group		
:COMMunicate?	Queries all settings related to communications.	6-45
:COMMunicate:HEADer	Sets whether to attach a header to the response data or queries the current setting.	6-45
:COMMunicate:LOCKout	Sets or clears local lockout.	6-45
:COMMunicate:OPSE	Sets the overlap command that is used by the *OPC, *OPC?, and *WAI commands or queries the current setting.	6-46
:COMMunicate:OPSR?	Queries the operation pending status register.	6-46
:COMMunicate:OVERlap	Sets the commands that will operate as overlap commands or queries the current setting.	6-46
:COMMunicate:REMOte	Switches between remote and local.	6-46
:COMMunicate:STATus?	Queries line-specific status.	6-46
:COMMunicate:VERBoSe	Sets whether to use abbreviated or unabbreviated form for response data.	6-46
:COMMunicate:WAIT	Waits for an extended event to occur.	6-46
:COMMunicate:WAIT?	Creates a response for the specified extended event.	6-46
CURSor Group		
:CURSor?	Queries all settings related to cursor measurements.	6-50
:CURSor[:TY]?	Queries all settings related to the cursor of the T-Y display.	6-50
:CURSor[:TY]:DEGRee?	Queries all settings related to the angle cursor.	6-50
:CURSor[:TY]:DEGRee:DX?	Queries the angle difference ΔD between angle cursors.	6-50
:CURSor[:TY]:DEGRee:DY?	Queries the ΔV value between angle cursors.	6-50
:CURSor[:TY]:DEGRee:JUMP	Jumps the angle cursor onto the zoom waveform.	6-50
:CURSor[:TY]:DEGRee:POSition<x>	Sets the angle cursor position or queries the current setting.	6-50
:CURSor[:TY]:DEGRee:REFerence<x>	Sets the position of the start point (Reference 1) or the end point (Reference 2) of the angle reference or queries the current setting.	6-50
:CURSor[:TY]:DEGRee:RVALue	Sets the reference angle of the angle cursor or queries the current setting.	6-50
:CURSor[:TY]:DEGRee:TRACe	Sets the target waveform of the angle cursor or queries the current setting.	6-51
:CURSor[:TY]:DEGRee:X<x>?	Queries the angle of the angle cursor.	6-51
:CURSor[:TY]:DEGRee:Y<x>?	Queries the voltage of the angle cursor.	6-51
:CURSor[:TY]:HORizontal?	Queries all settings related to H cursor.	6-51
:CURSor[:TY]:HORizontal:DY?	Queries the Y-axis value between the H cursors.	6-51
:CURSor[:TY]:HORizontal:POSition<x>	Sets the H cursor position or queries the current setting.	6-51
:CURSor[:TY]:HORizontal:TRACe	Sets the target waveform of the H cursor or queries the current setting.	6-51
:CURSor[:TY]:HORizontal:Y<x>?	Queries the Y-axis value of the H cursor.	6-51
:CURSor[:TY]:LOGic?	Queries all settings related to the logic display of the T-Y display.	6-51
:CURSor[:TY]:LOGic:FORMat	Sets the numerical notation of the logic display of the T-Y display.	6-51
:CURSor[:TY]:LOGic:ORder	Sets the higher/lower bit of the logic display of the T-Y display.	6-51
:CURSor[:TY]:MARKer?	Queries all settings related to the marker cursor.	6-51
:CURSor[:TY]:MARKer:DX<x>?	Queries the X-axis value between the marker cursors.	6-52
:CURSor[:TY]:MARKer:DY<x>?	Queries the physical value of the Y-axis between the marker cursors.	6-52
:CURSor[:TY]:MARKer:M<x>?	Queries all settings related to the specified marker cursor.	6-52
:CURSor[:TY]:MARKer:M<x>:JUMP	Jumps the marker cursor onto the zoom waveform.	6-52
:CURSor[:TY]:MARKer:M<x>:POSition	Sets the X-axis value at the marker cursor position or queries the current setting.	6-52

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Command	Function	Page
:CURSor[:TY]:MARKer:M<x>:TRACe	Sets the target waveform of the marker cursor or queries the current setting.	6-52
:CURSor[:TY]:MARKer:X<x>?	Queries the X-axis value at the marker cursor position.	6-52
:CURSor[:TY]:MARKer:Y<x>?	Queries the Y-axis value at the marker cursor position.	6-52
:CURSor[:TY]:TYPE	Sets the cursor type or queries the current setting.	6-52
:CURSor[:TY]:VERTical?	Queries all settings related to V cursor.	6-52
:CURSor[:TY]:VERTical:DX?	Queries the X-axis value between the V cursors.	6-53
:CURSor[:TY]:VERTical:DY?	Queries the Y-axis value between the V cursors.	6-53
:CURSor[:TY]:VERTical:JUMP	Jumps the V cursor onto the zoom waveform.	6-53
:CURSor[:TY]:VERTical:PERDt?	Queries the 1/ΔT value between V cursors.	6-53
:CURSor[:TY]:VERTical:POSition<x>	Sets the V cursor position or queries the current setting.	6-53
:CURSor[:TY]:VERTical:TRACe	Sets the target waveform of the V cursor or queries the current setting.	6-53
:CURSor[:TY]:VERTical:X<x>?	Queries the X-axis value at the V cursor position.	6-53
:CURSor[:TY]:VERTical:Y<x>?	Queries the Y-axis value at the V cursor position.	6-53
:CURSor:XY?	Queries all settings related to the cursor of the X-Y display.	6-53
:CURSor:XY:HORizontal?	Queries all settings related to the H cursor of the X-Y display.	6-53
:CURSor:XY:HORizontal:DY?	Queries the Y-axis value between H cursors of the X-Y display.	6-54
:CURSor:XY:HORizontal:POSition<x>	Sets the H cursor position of the X-Y display or queries the current setting.	6-54
:CURSor:XY:HORizontal:STRACe	Sets the target waveform of the H cursor of the X-Y display when in Single mode or queries the current setting.	6-54
:CURSor:XY:HORizontal:TRACe	Sets the target waveform of the H cursor of the X-Y display or queries the current setting.	6-54
:CURSor:XY:HORizontal:Y<x>?	Queries the Y-axis value of the H cursor of the X-Y display.	6-54
:CURSor:XY:MARKer?	Queries all settings related to the marker cursor of the X-Y display.	6-54
:CURSor:XY:MARKer:POSition	Sets the X-axis value at the marker cursor position of the X-Y display or queries the current setting.	6-54
:CURSor:XY:MARKer:STRACe	Sets the target waveform of the marker cursor of the X-Y display when in Single mode or queries the current setting.	6-54
:CURSor:XY:MARKer:T?	Queries the time value of the marker cursor of the X-Y display.	6-54
:CURSor:XY:MARKer:TRACe	Sets the target waveform of the marker cursor of the X-Y display or queries the current setting.	6-54
:CURSor:XY:MARKer:X?	Queries the X-axis value at the marker cursor position of the X-Y display.	6-54
:CURSor:XY:MARKer:Y?	Queries the Y-axis value at the marker cursor position of the X-Y display.	6-54
:CURSor:XY:TYPE	Sets the cursor type of the X-Y display or queries the current setting.	6-55
:CURSor:XY:VERTical?	Queries all settings related to the V cursor of the X-Y display.	6-55
:CURSor:XY:VERTical:DX?	Queries the X-axis value between V cursors of the X-Y display.	6-55
:CURSor:XY:VERTical:POSition<x>	Sets the V cursor position of the X-Y display or queries the current setting.	6-55
:CURSor:XY:VERTical:STRACe?	Queries the target waveform of the V cursor of the X-Y display when in Single mode.	6-55
:CURSor:XY:VERTical:TRACe	Sets the target waveform of the V cursor of the X-Y display or queries the current setting.	6-55
:CURSor:XY:VERTical:X<x>?	Queries the X-axis value at the V cursor position of the X-Y display.	6-55
DISPlay Group		
:DISPlay?	Queries all settings related to the display.	6-58
:DISPlay:ACCumulate?	Queries all settings related to the accumulated display of waveforms.	6-58
:DISPlay:ACCumulate:MODE	Sets the accumulate mode or queries the current setting.	6-58
:DISPlay:ACCumulate:PERSistence	Sets the accumulate count or queries the current setting.	6-58
:DISPlay:COLor?	Queries all settings related to the color.	6-59
:DISPlay:COLor:{CHANnel<x> MATH<x> PodA PodB}	Sets the color of the waveform or queries the current setting.	6-59
:DISPlay:COLor:{BACK CAPTure}	Sets the color of the background or the sub waveform window or queries the current setting.	6-59
:DISPlay:COLor:BASecolor	Sets the basic color of the menu or queries the current setting.	6-59
:DISPlay:DECimation	Sets the number of decimation points or queries the current setting.	6-59
:DISPlay:ESIZE	Sets the extra window size or queries the current setting.	6-59
:DISPlay:EWINDOW	Turns ON/OFF the extra window or queries the current setting.	6-59
:DISPlay:FORMat	Sets the display format or queries the current setting.	6-59
:DISPlay:GRATICule	Sets the grid (graticule) or queries the current setting.	6-59
:DISPlay:INTENSity?	Queries all settings related to the brightness of the displayed items.	6-59
:DISPlay:INTENSity:{CURSor MENU GRID SNAP WAVEform MARKer CAPTure BACK}	Sets the brightness of the display item or queries the current setting.	6-60
:DISPlay:INTerpolate	Sets the interpolation method or queries the current setting.	6-60
:DISPlay:LEVel	Sets the level indicator display or queries the current setting.	6-60
:DISPlay:MAPPING	Sets the mode of the waveform mapping to the split screen or queries the current setting.	6-60

Command	Function	Page
:DISPlay:SMAPping?	Queries all the settings related to the waveform mapping to the split screen.	6-60
:DISPlay:SMAPping:{CHANnel<x> MATH<x> PODA PODB}	Sets the waveform mapping to the split screen or queries the current setting.	6-60
:DISPlay:SVALue	Turns ON/OFF the scale value display or queries the current setting.	6-60
:DISPlay:TLABel	Turns ON/OFF the waveform label display or queries the current setting.	6-60
:DISPlay:TRANslucent	Turns ON/OFF the translucent mode of the pop-up menu or queries the current setting.	6-60
FILE Group		
:FILE?	Queries all settings related to the storage medium.	6-77
:FILE:BACKup?	Queries all settings related to the saving and loading setup data on the SL1400.	6-64
:FILE:BACKup:NUMBer	Sets the number of the SL1400 memory to save or load the setup data or queries the current setting.	6-64
:FILE:BACKup:COMMeNt	Sets the comment for the setup data to be saved or queries the current setting.	6-64
:FILE:BACKup:SAVE[:EXECute]	Executes the saving of the setup data to the SL1400.	6-64
:FILE:BACKup:SAVE:ABORt	Aborts the saving of the setup data to the SL1400.	6-64
:FILE:BACKup:LOAD[:EXECute]	Executes the loading of the setup data saved to the SL1400.	6-64
:FILE:BACKup:LOAD:ABORt	Aborts the loading of the setup data saved to the SL1400.	6-64
:FILE:DELeTe:{ASCIi BINary BMP FLOat MEASure PDF POSTscript REALtime SETup SNAP JPEG PNG}[:EXECute]	Executes the deletion of the data file.	6-64
:FILE:DIRectory?	Queries all settings related to the directory of the storage medium.	6-64
:FILE[:DIRectory]:CDIRectory	Changes the directory of the storage medium.	6-64
:FILE[:DIRectory]:DRIVE	Sets the storage medium to be controlled.	6-64
:FILE[:DIRectory]:FILTer	Sets the filter of the target filter or queries the current setting.	6-65
:FILE[:DIRectory]:FREE?	Queries the free disk space (bytes) on the target storage medium.	6-65
:FILE[:DIRectory]:MDIRectory	Creates a directory in the current directory.	6-65
:FILE[:DIRectory]:PATH?	Queries the current directory.	6-65
:FILE:LOAD:{BINary REALtime SETup SNAP}:ABORt	Aborts the loading of the data.	6-65
:FILE:LOAD:{BINary REALtime SETup SNAP}[:EXECute]	Executes the loading of the data.	6-65
:FILE:SAVE?	Queries all settings related to the saving of files.	6-65
:FILE:SAVE:ANAMing	Sets the auto naming function of the saved files or queries the current setting.	6-65
:FILE:SAVE:{ASCIi BINary FLOat}?	Queries all settings related to the saving of the data.	6-65
:FILE:SAVE:{ASCIi BINary FLOat MEASure SETup SNAP}:ABORt	Aborts the save operation.	6-65
:FILE:SAVE:{ASCIi BINary FLOat MEASure SETup SNAP}[:EXECute]	Executes the saving of the file.	6-65
:FILE:SAVE:{ASCIi BINary FLOat}:HISTory	Sets the save target of the history memory or queries the current setting.	6-65
:FILE:SAVE:{ASCIi BINary FLOat}:RANGe	Sets the range of data to be saved or queries the current setting.	6-65
:FILE:SAVE:{ASCIi BINary FLOat}:TRACe	Sets the waveform to be saved or queries the current setting.	6-66
:FILE:SAVE:ASCIi:INTerval	Sets the decimation interval for saving data or queries the current setting.	6-66
:FILE:SAVE:BINary:COMPRession	Sets the data compression of the waveform to be saved or queries the current setting.	6-66
:FILE:SAVE:COMMeNt	Sets the comment or queries the current setting.	6-66
:FILE:SAVE:NAME	Sets the name of the saved file or queries the current setting.	6-66
HCOPy Group		
:HCOPy?	Queries all settings related to the printing of screen image data.	6-71
:HCOPy:ABORt	Aborts printing and paper feeding.	6-71
:HCOPy:COMMeNt	Sets the comment at the lower right corner of the screen or queries the current setting.	6-71
:HCOPy:DIRection	Sets the print destination or queries the current setting.	6-71
:HCOPy:EXECute	Executes printing.	6-71
:HCOPy:EXTPrinter?	Queries all settings related to printing to an external printer.	6-71
:HCOPy:EXTPrinter:PRINter?	Queries the addresses of all the printers that are currently connected.	6-71
:HCOPy:EXTPrinter:SELeCt	Sets the address of the printer or queries the current setting.	6-72
:HCOPy:EXTPrinter:TONE	Turns ON/OFF color printing to the external printer or queries the current setting.	6-72

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Command	Function	Page
:HCOpy:EXTPrinter:TYPE	Sets the output format and output resolution for printing to the external printer or queries the current setting.	6-72
:HCOpy:NETPrint?	Queries all settings related to printing on the network printer.	6-72
:HCOpy:NETPrint:TONE	Turns ON/OFF color printing to the network printer or queries the current setting.	6-72
:HCOpy:NETPrint:TYPE	Sets the output format and output resolution for printing to the network printer or queries the current setting.	6-72
:HCOpy:PDF?	Queries all settings related to the PDF file generation.	6-72
:HCOpy:PDF:AUTHor	Sets the author of the PDF file or queries the current setting.	6-72
:HCOpy:PDF:COLOr	Sets color or monochrome for the PDF file or queries the current setting.	6-72
:HCOpy:PDF:COMPReSSion	Sets the compression of the PDF file or queries the current setting.	6-72
:HCOpy:PDF:DPPage	Sets the number of divisions per page of the PDF file or queries the current setting.	6-72
:HCOpy:PDF:KEYWord	Sets the keyword of the PDF file or queries the current setting.	6-73
:HCOpy:PDF:ORientation	Sets the orientation (portrait or landscape) of the PDF file output or queries the current setting.	6-73
:HCOpy:PDF:PSIZE	Sets the paper size of the PDF file or queries the current setting.	6-73
:HCOpy:PDF:SUBTitle	Sets the subtitle of the PDF file or queries the current setting.	6-73
:HCOpy:PDF:TITLe	Sets the title of the PDF file or queries the current setting.	6-73
:HCOpy:PDF:SAVE?	Queries all settings related to the saving of the PDF file to the storage medium.	6-73
:HCOpy:PDF:SAVE:ANAMing	Sets the auto naming function of the saved files or queries the current setting.	6-73
:HCOpy:PDF:SAVE:CDIRectory	Changes the save destination directory.	6-73
:HCOpy:PDF:SAVE:DRIVE	Sets the save destination storage medium.	6-73
:HCOpy:PDF:SAVE:NAME	Sets the name of the saved file or queries the current setting.	6-73
:HCOpy:PDF:SAVE:PATH?	Queries the current directory.	6-73
:HCOpy:PRINter?	Queries all settings related to printing to the built-in printer.	6-73
:HCOpy:PRINter:FEED	Executes paper feeding of the built-in printer.	6-73
:HCOpy:PRINter:MAG	Sets the magnification for fine print (long) or zoom print during external clock measurement or queries the current setting.	6-74
:HCOpy:PRINter:RANGE	Sets the print range for fine print (long) or A4 print or queries the current setting.	6-74
:HCOpy:PRINter:RATE	Sets the magnification (set in terms of the record time) for fine copy when the measurement is performed using the internal clock.	6-74
:HCOpy:PRINter:TYPE	Sets the output format (normal, fine print (long), zoom print, or A4 print) or queries the current setting.	6-74
:HCOpy:PSETup?	Queries all settings related to the print setting of the screen image.	6-74
:HCOpy:PSETup:EAREa	Turns ON/OFF the extra area when printing with the display format set to Single/Dual/Triad/Quad or queries the current setting.	6-75
:HCOpy:PSETup:FLEXiblezone?	Queries all settings related to flexible zone recording when printing with the format set to Single.	6-75
:HCOpy:PSETup:FLEXiblezone:MODE	Turns ON/OFF the flexible zone area when printing with the display format set to Single or queries the current setting.	6-75
:HCOpy:PSETup:FLEXiblezone:{CHANnel<x> MATH<x>}:UPPer	Sets the upper limit of the flexible zone area of the channel when printing with the display format set to Single or queries the current setting.	6-75
:HCOpy:PSETup:FLEXiblezone:{CHANnel<x> MATH<x>}:LOWer	Sets the lower limit of the flexible zone area of the channel when printing with the display format set to Single or queries the current setting.	6-75
:HCOpy:PSETup:GDLight	Sets the density of the print graticule or queries the current setting.	6-75
:HCOpy:PSETup:GWIDth	Sets the print graticule width of the vertical axis or queries the current setting.	6-76
:HCOpy:PSETup:SCALE	Sets the scale print interval for waveform printing or queries the current setting.	6-76
:HCOpy:PSETup:CHLabel	Sets the channel label print interval for waveform printing or queries the current setting.	6-76
:HCOpy:PSETup:TIME	Sets the time print interval for waveform printing or queries the current setting.	6-76
:HCOpy:PSETup:GAUGE	Sets the gauge printing for waveform printing or queries the current setting.	6-76
:HCOpy:PSETup:ANNOtation	Sets the annotation print interval for waveform printing or queries the current setting.	6-76
:HCOpy:PSETup:ANTYpe	Sets the annotation content for waveform printing or queries the current setting.	6-76
:HCOpy:PSETup:{CHANnel<x> MATH<x>}:MESSAge	Sets the message of the channel for waveform printing or queries the current setting.	6-76

Command	Function	Page
HISTory Group		
:HISTory?	Queries all settings related to the history memory function.	6-79
:HISTory:ABORt	Aborts the history search.	6-79
:HISTory:CLEAr	Executes history clear.	6-79
:HISTory:DISPlay	Sets the start number or end number of the display record or queries the current setting.	6-79
:HISTory:DMODE	Sets the waveform display format (one waveform, all waveforms, or average) or queries the current setting.	6-79
:HISTory:EXECute	Executes the history search.	6-79
:HISTory:PARAMeter?	Queries all settings related to the history search (waveform parameter).	6-79
:HISTory:PARAMeter:ITEM<x>?	Queries all settings related to the parameter of the history search (waveform parameter).	6-79
:HISTory:PARAMeter:ITEM<x>:CONDition	Sets the criteria of the parameter of the history search (waveform parameter) or queries the current setting.	6-79
:HISTory:PARAMeter:ITEM<x>:SOURce	Sets the source trace of the parameter of the history search (waveform parameter) or queries the current setting.	6-79
:HISTory:PARAMeter:ITEM<x>:TYPE:<Parameter>	Sets the parameter and the upper and lower limits of each parameter of the history search (waveform parameter) or queries the current setting.	6-80
:HISTory:PARAMeter:ITEM<x>:VALue?	Queries the measured value of the specified parameter of the parameter search or queries the current setting.	6-80
:HISTory:PARAMeter:LOGic	Sets the determination logic of the parameter search or queries the current setting.	6-80
:HISTory:PARAMeter:TLINKage	Turns ON/OFF the linked movement of the determination range cursor of the parameter search.	6-80
:HISTory:PARAMeter:TRANge	Sets the range over which to perform the parameter search or queries the current setting.	6-80
:HISTory:RECOrd	Sets the target record or queries the current setting.	6-80
:HISTory:RECOrd?MINimum	Queries the minimum record number.	6-80
:HISTory:SMODE	Turns ON/OFF the search mode of history memory or queries the current setting.	6-80
:HISTory:TIME?	Queries the time of the target record number.	6-80
:HISTory:ZONE?	Queries all settings related to the zone search.	6-81
:HISTory:ZONE:EDIT<x>?	Queries all settings related to the specified search zone.	6-81
:HISTory:ZONE:EDIT<x>:CONDition	Sets the search condition of the zone cursor or queries the current setting.	6-81
:HISTory:ZONE:EDIT<x>:HORizontal	Sets the upper/lower of the search zone or queries the current setting.	6-81
:HISTory:ZONE:EDIT<x>:SOURce	Sets the target waveform of the zone search or queries the current setting.	6-81
:HISTory:ZONE:EDIT<x>:VERTical	Sets the left/right of the search zone or queries the current setting.	6-81
:HISTory:ZONE:LOGic	Sets the search logic condition between zone searches or queries the current setting.	6-81
IMAGe Group		
:IMAGe?	Queries all settings related to the saving of screen image data.	6-83
:IMAGe:ABORt	Aborts saving the screen image data to the storage medium.	6-83
:IMAGe:COMMEnt	Sets the comment on the screen or queries the current setting.	6-83
:IMAGe:COMPreSSion	Sets the screen data compression of the BMP format or queries the current setting.	6-83
:IMAGe:EXECute	Executes the saving of the screen image data to the storage medium.	6-83
:IMAGe:FORMat	Sets the save format of the screen image data or queries the current setting.	6-83
:IMAGe:SAVE?	Queries all settings related to the saving of the screen image data to the storage medium.	6-83
:IMAGe:SAVE:ANAMing	Sets the auto naming function of the saved files or queries the current setting.	6-83
:IMAGe:SAVE:CDIRectory	Changes the save destination directory.	6-83
:IMAGe:SAVE:DRIVE	Sets the save destination storage medium or queries the current setting.	6-83
:IMAGe:SAVE:NAME	Sets the name of the saved file or queries the current setting.	6-83
:IMAGe:SAVE:PATH?	Queries the current directory.	6-83
:IMAGe:SEND?	Queries the screen image data.	6-83
:IMAGe:TONE	Sets the color tone of the screen image data to be saved or queries the current setting.	6-83
INITialize Group		
:INITialize:EXECute	Executes the initialization of settings.	6-84
:INITialize:UNDO	Undoes the execution of the initialization of settings.	6-84

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Command	Function	Page
LOGic Group		
:LOGic?	Queries all settings related to the logic waveforms.	6-86
:LOGic:{PODA PODB}?	Queries all settings related to the specified logic waveform.	6-86
:LOGic:{PODA PODB}:ALL:DISPlay	Turns ON/OFF the display of all bits of the specified logic waveform.	6-86
:LOGic:{PODA PODB}:{BIT1~8}:DISPlay	Sets the display of the bit of the specified logic waveform or queries the current setting.	6-86
:LOGic:{PODA PODB}:{BIT1~8}:LABel	Sets the label of the bit of the specified logic waveform or queries the current setting.	6-86
:LOGic:{PODA PODB}:BMAPping	Turns ON/OFF the bit display position of the specified logic waveform or queries the current setting.	6-86
:LOGic:{PODA PODB}:DISPlay	Turns ON/OFF the display of all bits of the specified logic waveform or queries the current setting.	6-86
:LOGic:{PODA PODB}:INPut	Sets the input of the specified logic waveform or queries the current setting.	6-86
:LOGic:{PODA PODB}:LABel	Sets the label of the specified logic waveform or queries the current setting.	6-87
:LOGic:{PODA PODB}:PROBe	Sets the logic probe or queries the current setting.	6-87
:LOGic:{PODA PODB}:POSiTion	Sets the vertical position of the specified logic waveform or queries the current setting.	6-87
:LOGic:{PODA PODB}:ZOOM	Sets the vertical zoom rate of the specified logic waveform or queries the current setting.	6-87
LStart Group		
:LStart	Executes log start.	6-87
:LStart?	Waits for the completion of the log start execution.	6-87
MATH Group		
:MATH<x>?	Queries all settings related to the computation.	6-89
:MATH<x>:BINary?	Queries all settings related to the binary computation.	6-90
:MATH<x>:BINary:{CHANnel<x> MATH<x>}	Sets the threshold level of the binary computation channel or queries the current setting.	6-90
:MATH<x>:DISPlay	Sets whether to display computed waveforms or queries the current setting.	6-90
:MATH<x>:ESHift:{CHANnel<x> MATH<x>}	Sets the phase offset of shift computation of the waveform measured with an external clock or queries the current setting.	6-90
:MATH<x>:EXECute	Executes the computation.	6-90
:MATH<x>:FFT?	Queries all settings related to the FFT computation.	6-90
:MATH<x>:FFT:POINt	Sets the number of points to be computed in the FFT computation or queries the current setting.	6-90
:MATH<x>:FFT:WINDow	Sets the time window used in the FFT computation or queries the current setting.	6-90
:MATH<x>:LABel	Sets the label of the computation or queries the current setting.	6-90
:MATH<x>:MODE	Turns ON/OFF the computation or queries the current setting.	6-90
:MATH<x>:MREFeRence	Sets the computation range or queries the current setting.	6-90
:MATH<x>:OPERation	Sets the computation details or queries the current setting.	6-91
:MATH<x>:SCALe?	Queries all settings related to scaling.	6-91
:MATH<x>:SCALe:MODE	Sets the scaling mode or queries the current setting.	6-91
:MATH<x>:SCALe:VALue	Sets the upper and lower limits for manual scaling or queries the current setting.	6-91
:MATH<x>:SHIFt:{CHANel<x> MATH<x>}	Sets the phase offset of shift computation of the waveform measured with an internal clock or queries the current setting.	6-91
:MATH<x>:UNIT	Sets the unit to be added to the computed result or queries the current setting.	6-91
MEASure Group		
:MEASure?	Queries all settings related to the automated measurement of waveform parameters.	6-94
:MEASure:{CHANnel<x> MATH<x>}?	Turns ON/OFF all the waveform parameters of the channel or queries the current setting.	6-95
:MEASure:{CHANnel<x> MATH<x>}:ALL	Turns ON/OFF collectively all the measurement items of the channel.	6-100
:MEASure:{CHANnel<x> MATH<x>}:COPY	Copies the ON/OFF setting of all measurement items of a specified channel to all other channels.	6-100

Command	Function	Page
:MEASure:{CHANnel<x> MATH<x>}:DELay?	Queries all settings related to the delay between channels of the waveform.	6-100
:MEASure:{CHANnel<x> MATH<x>}:DELay:COUNT?	Queries the statistical processing count of the delay between channels.	6-100
:MEASure:{CHANnel<x> MATH<x>}:DELay:{MAXimum MEAN MINimum SDEVIation}?	Queries the statistical value of the delay between channels.	6-100
:MEASure:{CHANnel<x> MATH<x>}:DELay:MEASure?	Queries all settings of the source waveform of the delay between channels.	6-100
:MEASure:{CHANnel<x> MATH<x>}:DELay:MEASure:COUNT	Sets the number of counts of the source waveform of the delay between channels.	6-100
:MEASure:{CHANnel<x> MATH<x>}:DELay:MEASure:SLOPe	Sets the slope of the source waveform of the delay between channels.	6-100
:MEASure:{CHANnel<x> MATH<x>}:DELay:REfERENCE?	Queries all settings of the reference waveform of the delay between channels.	6-101
:MEASure:{CHANnel<x> MATH<x>}:DELay:REfERENCE:COUNT	Sets the number of edge detection count of the reference waveform of the delay between channels.	6-101
:MEASure:{CHANnel<x> MATH<x>}:DELay:REfERENCE:SLOPe	Sets the edge detection slope of the reference waveform of the delay between channels.	6-101
:MEASure:{CHANnel<x> MATH<x>}:DELay:REfERENCE:SOURce	Sets the reference of the delay between channels to the trigger point or the waveform or queries the current setting.	6-101
:MEASure:{CHANnel<x> MATH<x>}:DELay:REfERENCE:TRACe	Sets the trace of the reference waveform of the delay between channels.	6-101
:MEASure:{CHANnel<x> MATH<x>}:DELay:STATe	Sets the display format of the delay parameter or queries the current setting.	6-101
:MEASure:{CHANnel<x> MATH<x>}:DELay:VALue?	Queries the value of the delay parameter of the waveform that is measured automatically.	6-101
:MEASure:{CHANnel<x> MATH<x>}:DPRoximal?	Queries all settings related to distal, mesial, and proximal.	6-102
:MEASure:{CHANnel<x> MATH<x>}:DPRoximal:MODE	Sets the mode of the distal, mesial, and proximal points or queries the current setting.	6-102
:MEASure:{CHANnel<x> MATH<x>}:DPRoximal:PERCent	Sets the distal, mesial, and proximal points or queries the current setting (%).	6-102
:MEASure:{CHANnel<x> MATH<x>}:DPRoximal:UNIT	Sets the distal, mesial, and proximal points or queries the current setting (voltage).	6-102
:MEASure:{CHANnel<x> MATH<x>}:METHod	Sets the High and Low points or queries the current setting.	6-102
:MEASure:{CHANnel<x> MATH<x>}:<Parameter>?	Queries all settings related to the parameter of the waveform.	6-102
:MEASure:{CHANnel<x> MATH<x>}:<Parameter>:COUNT?	Queries the number of measured values of the cycle statistical processing of the parameter.	6-103
:MEASure:{CHANnel<x> MATH<x>}:<Parameter>:{MAXimum MEAN MINimum SDEVIation}?	Queries the cycle statistical processing value of the parameter.	6-103
:MEASure:{CHANnel<x> MATH<x>}:<Parameter>:STATe	Turns ON/OFF the parameter of the waveform or queries the current setting.	6-103
:MEASure:{CHANnel<x> MATH<x>}:<Parameter>:VALue?	Queries the value of the parameter of the waveform that is measured automatically.	6-103
:MEASure:CDEStination:{CHANnel<x> MATH<x>}	Sets the channel to which the ON/OFF settings of all measurement items of a certain channel are to be copied or queries the current setting.	6-104
:MEASure:CDEStination:ALL	Copies the ON/OFF settings of all measurement items of all channels.	6-104
:MEASure:CYCLe?	Queries all settings related to the cycle statistical processing of waveform parameters.	6-104
:MEASure:CYCLe:ABORT	Aborts the execution of the cycle statistical processing of waveform parameters.	6-104
:MEASure:CYCLe:EXECute	Executes the cycle statistical processing of waveform parameters.	6-104

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Command	Function	Page
:MEASure:CYCLe:TRACe{OWN <Nrf> MATH<x>}	Sets the target waveform of cycle statistical processing of waveform parameters or queries the current setting.	6-104
:MEASure:MODE	Sets the mode of the automated measurement of waveform parameters or queries the current setting.	6-104
:MEASure:ONECycle	Turns ON/OFF the 1 cycle mode of the automated measurement of waveform parameters or queries the current setting.	6-104
:MEASure:TRANge	Sets the measurement range of the automated measurement of waveform parameters or queries the current setting.	6-104
:MEASure:WAIT?	Waits for the completion of the automated measurement.	6-104
MONITOR Group		
:MONitor:ASEND?	Outputs the numeric monitor data (ASCII format).	6-106
:MONitor:ASEND:{CHANnel<x> PODA PODB}?	Outputs the numeric monitor data (ASCII format) of the specified trace.	6-106
:MONitor:BYTeorder	Sets the transmission order when using word format of two bytes or more or queries the current setting.	6-106
:MONitor:EXECute	Executes screen display switching.	6-106
:MONitor:FORMAT	Sets the format of the data to be transmitted or queries the current setting.	6-106
:MONitor:OFFSet:CHANnel<x>?	Queries the offset value used to convert the numeric monitor data of the specified trace into physical values.	6-106
:MONitor:RANGe:CHANnel<x>?	Queries the range value used to convert the numeric monitor data of the specified trace into physical values.	6-106
:MONitor:SEND:{ALL CHANnel<x> PODA PODB}?	Outputs the numeric monitor data	6-106
MTRIGGER Group		
:MTRigger	Executes manual trigger.	6-108
REcorder Group		
:REcorder?	Queries all settings related to the recorder mode.	6-112
:REcorder:ACQuire?	Queries all settings related to the waveform acquisition for Chart Recorder mode.	6-112
:REcorder:ACQuire:MODE	Sets the waveform acquisition mode for Chart Recorder mode or queries the current setting.	6-112
:REcorder:MODE	Sets the recorder mode or queries the current setting.	6-112
:REcorder:CHART?	Queries all settings related to Chart Recorder mode.	6-112
:REcorder:CHART:PSTyle	Sets the print style for Chart Recorder mode or queries the current setting.	6-112
:REcorder:CHART:CSPeet	Sets the chart speed for Chart Recorder mode or queries the current setting.	6-112
:REcorder:CHART:SHOT	Sets the short recording for Chart Recorder mode or queries the current setting.	6-112
:REcorder:CHART:PRINterout	Turns ON/OFF the chart recording for T-Y recording in Chart Recorder mode or queries the current setting.	6-112
:REcorder:CHART:OUTDevice	Sets the output destination device for numeric value recording in Chart Recorder mode or queries the current setting.	6-112
:REcorder:CHART:INTerval	Sets the recording interval for numeric value recording in Chart Recorder mode or queries the current setting.	6-112
:REcorder:CHART:DIRection	Sets the print direction for numeric value recording in Chart Recorder mode or queries the current setting.	6-113
:REcorder:CHART:SAVE?	Queries all settings related to the saving of the numeric recording in Chart Recorder mode to the storage medium.	6-113
:REcorder:CHART:SAVE:ANAMing	Sets the auto naming function of the saved files or queries the current setting.	6-113
:REcorder:CHART:SAVE:CDIRectory	Changes the save destination directory.	6-113
:REcorder:CHART:SAVE:DRIVE	Sets the save destination storage medium.	6-113
:REcorder:CHART:SAVE:NAME	Sets the name of the saved file or queries the current setting.	6-113
:REcorder:CHART:SAVE:PATH?	Queries the current directory.	6-113
:REcorder:XY?	Queries all settings related to the X-Y recorder mode.	6-113
:REcorder:XY:AUTO	Turns ON/OFF auto print for X-Y recorder mode or queries the current setting.	6-113
:REcorder:XY:PFONt	Sets the size of the printed characters for X-Y recorder mode or queries the current setting.	6-113
:REcorder:XY:POINter	Turns ON/OFF the pointer indicating the most recent point for X-Y recorder mode or queries the current setting.	6-113

Command	Function	Page
:RECOder:XY:SCALE	Turns ON/OFF the scale for X-Y recorder mode or queries the current setting.	6-113
:RECOder:XY:SRATE	Sets the sample rate for X-Y recorder mode or queries the current setting.	6-114
:RECOder:XY:XY<x>?	Queries all settings of the XY waveform for X-Y recorder mode.	6-114
:RECOder:XY:XY<x>:DISPlay	Turns ON/OFF the XY waveform for X-Y recorder mode or queries the current setting.	6-114
:RECOder:XY:XY<x>:XTRace	Sets the channel to be assigned to the X-axis of the XY waveform for X-Y recorder mode or queries the current setting.	6-114
:RECOder:XY:XY<x>:YTRace	Sets the channel to be assigned to the Y-axis of the XY waveform for X-Y recorder mode or queries the current setting.	6-114
:RECOder:REPrint?	Queries all settings related to reprinting.	6-114
:RECOder:REPrint:ABORT	Aborts reprinting or paper feeding.	6-114
:RECOder:REPrint:EXECute	Executes reprinting.	6-114
:RECOder:REPrint:LENGth	Sets the print length of the section to be reprinted or queries the current setting.	6-114
:RECOder:REPrint:PTO	Sets the output destination for reprinting or queries the current setting.	6-114
:RECOder:REPrint:RANGe	Sets the range to be reprinted (start and end points) or queries the current setting.	6-114
:RECOder:REPrint:PRNMag	Sets the waveform magnification for reprinting or queries the current setting.	6-114
:RECOder:REPrint:WINMag	Sets the magnification of the section to be reprinted or queries the current setting.	6-115
:RECOder:REPrint:WINPos	Sets the zoom position of the section to be reprinted or queries the current setting.	6-115
SNAP Group		
:SNAP	Executes the snapshot.	6-115
SSTart Group		
:SSTart	Executes single start.	6-115
:SSTart?	Waits for the completion of the single start execution.	6-115
STARt Group		
:STARt	Starts the waveform acquisition.	6-116
STATus Group		
:STATus?	Queries all settings related to the communication status function.	6-116
:STATus:CONDition?	Queries the condition register.	6-116
:STATus:EES	Sets the extended event enable register or queries the current setting.	6-117
:STATus:EESR?	Queries the extended event register and clears the register.	6-117
:STATus:ERRor?	Queries the code and description of the error that occurred.	6-117
:STATus:FILTer<x>	Sets the transition filter or queries the current setting.	6-117
:STATus:QENable	Sets whether or not to store messages other than errors to the error queue or queries the current setting.	6-117
:STATus:QMESsage	Sets whether to attach a message to the response to the :STATus:ERRor? query or queries the current setting.	6-117
:STATus:SPOLL?	Executes the serial polling.	6-117
STOP Group		
:STOP	Stops the waveform acquisition.	6-117
SYSTEM Group		
:SYSTem?	Queries all settings related to the system.	6-120
:SYSTem:CLICk	Turns ON/OFF the click sound or queries the current setting.	6-120
:SYSTem:CLOCK?	Queries all settings related to the date and time.	6-120
:SYSTem:CLOCK:DATE	Sets the date or queries the current setting.	6-120
:SYSTem:CLOCK:MODE	Turns ON/OFF the date/time display or queries the current setting.	6-120
:SYSTem:CLOCK:SNTP:GMTTime	Sets the time difference from GMT when using SNTP or queries the current setting.	6-120
:SYSTem:CLOCK:TIME	Sets the time or queries the current setting.	6-120
:SYSTem:CLOCK:TYPE	Sets whether to set the date/time manually or by using SNTP or queries the current setting.	6-120
:SYSTem:HDMotor	Turns ON/OFF the motor of the internal hard disk or queries the current setting.	6-120
:SYSTem:KEYResponse	Sets the response time of the START/STOP key or queries the current setting.	6-120
:SYSTem:LANGUage	Sets the message language or queries the current setting.	6-120
:SYSTem:LCD?	Queries all settings related to the LCD.	6-120

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Command	Function	Page
:SYSTem:LCD:AUTO?	Queries all settings related to the auto off function of the LCD backlight.	6-120
:SYSTem:LCD:AUTO:MODE	Turns ON/OFF the auto off function of the LCD backlight or queries the current setting.	6-120
:SYSTem:LCD:AUTO:TIME	Sets the auto off time of the LCD backlight or queries the current setting.	6-121
:SYSTem:LCD:BRIGhtness	Sets the brightness of the LCD or queries the current setting.	6-121
:SYSTem:LCD:MODE	Turns ON/OFF the LCD backlight or queries the current setting.	6-121
:SYSTem:MLANguage	Sets the menu language or queries the current setting.	6-121
:SYSTem:OVERview	Displays system information.	6-121
:SYSTem:PACTion	Sets whether to enable the action-on-trigger mode at power ON or queries the current setting.	6-121
:SYSTem:PStart	Sets whether to start the waveform acquisition at power ON or queries the current setting.	6-121
:SYSTem:SCALefont	Sets the display size, large or small, of the scale values and waveform labels or queries the current setting.	6-121
:SYSTem:SCSI?	Queries all settings related to the SCSI-ID.	6-121
:SYSTem:SCSI:INITialize	Changes the SCSI-ID.	6-121
:SYSTem:SCSI:INTernalid	Set the SCSI-ID of the internal hard disk or queries the current settings.	6-121
:SYSTem:SCSI:OWNid	Set the SCSI-ID of the SL1400 or queries the current settings.	6-121
:SYSTem:VIDeo	Turns ON/OFF the video output or queries the current setting.	6-121
TIMEbase Group		
:TIMEbase?	Queries all settings related to the time base.	6-122
:TIMEbase:RECTime	Sets the record time or queries the current setting.	6-122
:TIMEbase:SOURce	Sets the time base or queries the current setting.	6-122
:TIMEbase:SRATE	Sets the sample rate or queries the current setting.	6-122
:TIMEbase:SRATE?	Queries the sample rate or queries the current setting.	6-123
TRIGger Group		
:TRIGger?	Queries all settings related to the trigger.	6-130
:TRIGger:ABN?	Queries all settings related to the A -> B(n) trigger.	6-131
:TRIGger:ABN:COUNT	Sets the number times condition B is to be satisfied or queries the current setting.	6-131
:TRIGger:ACTion?	Queries all settings related to the action-on-trigger.	6-131
:TRIGger:ACTion:COUNT	Sets the action count of action-on-trigger or queries the current setting.	6-131
:TRIGger:ACTion:BUZZer	Sets whether a beep is sounded when an action is activated or queries the current setting.	6-131
:TRIGger:ACTion:HCOPY	Sets whether to output a hard copy to the built-in printer or an external printer when an action is activated or queries the current setting.	6-131
:TRIGger:ACTion:IMAGe	Sets whether to save the screen image to the storage medium when an action is activated or queries the current setting.	6-131
:TRIGger:ACTion:MAIL?	Queries all settings related to the mail transmission when an action is activated.	6-131
:TRIGger:ACTion:MAIL:COUNT	Sets the upper limit on the number of transmitted mail when an action is activated or queries the current setting.	6-131
:TRIGger:ACTion:MAIL:MODE	Queries whether a mail is set to be transmitted when an action is activated.	6-131
:TRIGger:ACTion:MODE	Sets the action-on-trigger mode or queries the current setting.	6-131
:TRIGger:ACTion:SAVE[:MODE]	Sets whether to save the waveform data to the storage medium when an action is activated or queries the current setting.	6-131
:TRIGger:ACTion:SAVE:TYPE	Sets the data type for saving waveform data when an action is activated or queries the current setting.	6-132
:TRIGger:ACTion:SEQuence	Sets whether to repeat the action or queries the current setting.	6-132
:TRIGger:ADB?	Queries all settings related to the A Delay B trigger.	6-132
:TRIGger:ADB:DELay	Sets the delay time of condition B or queries the current setting.	6-132
:TRIGger:ATRigger?	Queries all settings related to condition A.	6-132
:TRIGger:ATRigger:CHANnel<x>	Sets the channel condition of condition A or queries the current setting.	6-132
:TRIGger:ATRigger:CONDition	Sets the condition to be satisfied for condition A or queries the current setting.	6-132
:TRIGger:ATRigger:LOGic?	Queries all settings related to the logic of condition A.	6-132
:TRIGger:ATRigger:LOGic:{A1~B8}	Sets the logic bit of condition A or queries the current setting.	6-132
:TRIGger:ATRigger:{PODA PODB}	Sets the logic condition of condition A or queries the current setting.	6-132
:TRIGger:BGTime?	Queries all settings related to the B>Time trigger.	6-133
:TRIGger:BGTime:TIME	Sets the pulse width of the B>Time trigger or queries the current setting.	6-133
:TRIGger:BLTime?	Queries all settings related to the B<Time trigger.	6-133
:TRIGger:BLTime:TIME	Sets the pulse width of the B<Time trigger or queries the current setting.	6-133
:TRIGger:BTOut?	Queries all settings related to the B Time Out trigger.	6-133
:TRIGger:BTOut:TIME	Sets the pulse width of the B Time Out trigger or queries the current setting.	6-133

Command	Function	Page
:TRIGger:BTRigger?	Queries all settings related to condition B.	6-133
:TRIGger:BTRigger:CHANnel<x>	Sets the channel condition of condition B or queries the current setting.	6-133
:TRIGger:BTRigger:CONDition	Sets the condition to be satisfied for condition B or queries the current setting.	6-133
:TRIGger:BTRigger:LOGic?	Queries all settings related the logic of condition B.	6-133
:TRIGger:BTRigger:LOGic:{A1~B8}	Sets the logic bit of condition B or queries the current setting.	6-134
:TRIGger:BTRigger:{PODA PODB}	Sets the logic condition of condition B or queries the current setting.	6-134
:TRIGger:DElay	Sets the delay or queries the current setting.	6-134
:TRIGger:EOA?	Queries all settings related to the Edge on A trigger.	6-134
:TRIGger:EOA:CHANnel<x>	Sets the channel condition of the Edge on A trigger or queries the current setting.	6-134
:TRIGger:EOA:{PODA PODB}	Sets the logic condition of the Edge on A trigger or queries the current setting.	6-134
:TRIGger:EOA:CONDition	Sets the condition to be satisfied for the Edge on A trigger or queries the current setting.	6-134
:TRIGger:HOLDoff?	Queries all settings related to the hold off.	6-134
:TRIGger:HOLDoff:TIME	Sets the hold off time or queries the current setting.	6-134
:TRIGger:MODE	Sets the trigger mode or queries the current setting.	6-134
:TRIGger:OR?	Queries all settings related to the OR trigger.	6-134
:TRIGger:OR:CHANnel<x>	Sets the channel condition of the OR trigger or queries the current setting.	6-135
:TRIGger:OR:{PODA PODB}	Sets the logic condition of the OR trigger or queries the current setting.	6-135
:TRIGger:POSition	Sets the trigger position or queries the current setting.	6-135
:TRIGger:SCount	Sets the number of times the trigger is to be activated when the trigger mode is Single(N) or queries the current setting.	6-135
:TRIGger[:SIMple]?	Queries all settings related to the simple trigger.	6-135
:TRIGger[:SIMple]:HYSTeresis	Sets the hysteresis of the search level or queries the current setting.	6-135
:TRIGger[:SIMple]:LEVel	Sets the trigger level of the channel or queries the current setting.	6-135
:TRIGger[:SIMple]:LOGic?	Queries all settings related to the logic of the simple trigger.	6-135
:TRIGger[:SIMple]:LOGic:BIT	Sets the bit for setting the trigger slope or queries the current setting.	6-135
:TRIGger[:SIMple]:LOGic:SLOPe	Sets the logic trigger slope or queries the current setting.	6-135
:TRIGger[:SIMple]:SLOPe	Sets the trigger slope of the channel or queries the current setting.	6-135
:TRIGger:SIMple:SOURce	Sets the trigger source or queries the current setting.	6-136
:TRIGger:SOURce?	Queries all settings related to the trigger source of enhance trigger.	6-136
:TRIGger:SOURce:CHANnel<x>?	Queries all settings related to the trigger source of the specified channel.	6-136
:TRIGger:SOURce:CHANnel<x>:CENTer	Sets the center of the window trigger or queries the current setting.	6-136
:TRIGger:SOURce:CHANnel<x>:HYSTeresis	Sets the hysteresis of the search level or queries the current setting.	6-136
:TRIGger:SOURce:CHANnel<x>:LEVel	Sets the trigger level of the specified channel or queries the current setting.	6-136
:TRIGger:SOURce:CHANnel<x>:WIDTh	Sets the width of the window trigger or queries the current setting.	6-137
:TRIGger:SOURce:CHANnel<x>:WWIDTh	Sets the width of the wave window trigger or queries the current setting.	6-137
:TRIGger:SOURce:LOGic:{A1~A8 B1~B8}	Sets the logic bit condition or queries the current setting.	6-137
:TRIGger:TGTime?	Queries all settings related to the T>Time trigger.	6-137
:TRIGger:TGTime:TIME	Sets the pulse width of the T>Time trigger or queries the current setting.	6-137
:TRIGger:TImEr?	Queries all settings related to the timer trigger.	6-137
:TRIGger:TImEr:DATE	Sets the date of the timer trigger or queries the current setting.	6-137
:TRIGger:TImEr:INTerval	Sets the trigger time interval of the timer trigger or queries the current setting.	6-137
:TRIGger:TImEr:TIME	Sets the trigger time of the timer trigger or queries the current setting.	6-137
:TRIGger:TITime?	Queries all settings related to the T1<T<T2 trigger.	6-137
:TRIGger:TITime:TIME<x>	Sets the pulse width of the T1<T<T2 trigger or queries the current setting.	6-138
:TRIGger:TlTime?	Queries all settings related to the T<Time trigger.	6-138
:TRIGger:TlTime:TIME	Sets the pulse width of the T<Time trigger or queries the current setting.	6-138
:TRIGger:TOTime?	Queries all settings related to the T<T1, T2<T trigger.	6-138
:TRIGger:TOTime:TIME<x>	Sets the pulse width of the T<T1, T2<T trigger or queries the current setting.	6-138
:TRIGger:TYPE	Sets the trigger type or queries the current setting.	6-138
:TRIGger:WINDow?	Queries all settings related to the window trigger.	6-138
:TRIGger:WINDow:CHANnel<x>	Sets the channel condition of the window trigger or queries the current setting.	6-138
:TRIGger:WINDow:{PODA PODB}	Sets the logic condition of the window trigger or queries the current setting.	6-138
:TRIGger:WWINDow?	Queries all settings related to the wave window trigger.	6-138
:TRIGger:WWINDow:CHANnel<x>	Sets the channel condition of the wave window trigger or queries the current setting.	6-138
:TRIGger:WWINDow:FREQuency	Sets the cycle frequency of the wave window trigger or queries the current setting.	6-138
:TRIGger:WWINDow:REFCycle	Sets the reference cycle of the wave window trigger or queries the current setting.	6-138
:TRIGger:WWINDow:SYNC?	Queries all settings related to the synchronization of the wave window trigger.	6-138
:TRIGger:WWINDow:SYNC:HYSTeresis	Sets the hysteresis of the synchronization channel of the wave window trigger or queries the current setting.	6-139

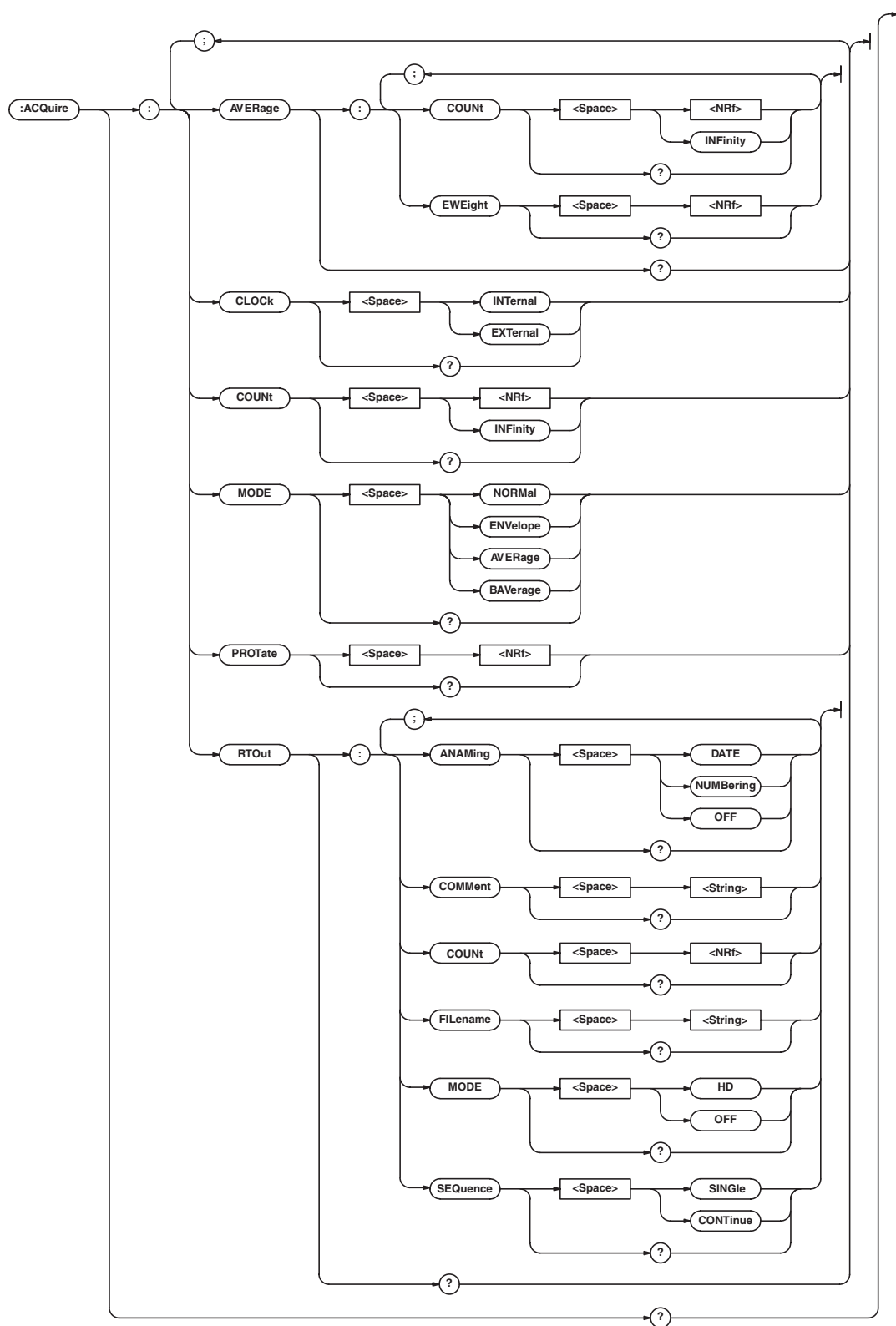
6.1 A List of Commands

Command	Function	Page
:TRIGger:WwINDow:SYNc:LEVel	Sets the level of the synchronization channel of the wave window trigger or queries the current setting.	6-139
:TRIGger:WwINDow:SYNc:TRACe	Sets the synchronization channel of the wave window trigger or queries the current setting.	6-139
WAVEform Group		
:WAVEform?	Queries all information about the target waveform data.	6-141
:WAVEform:BITs?	Queries the bit length of the target waveform data.	6-141
:WAVEform:BYTeorder	Sets the transmission order of word format data or queries the current setting.	6-141
:WAVEform:DATaselect	Sets the data format used to query the waveform data or queries the current setting.	6-141
:WAVEform:END	Sets the end data point of the target waveform or queries the current setting.	6-141
:WAVEform:FORMat	Sets the format of the transmitted data or queries the current setting.	6-141
:WAVEform:LENGth?	Queries the total number of data points of the target waveform.	6-141
:WAVEform:MODUle?	Queries the module of the target waveform.	6-141
:WAVEform:OFFSet?	Queries the offset value of the target waveform.	6-141
:WAVEform:RANGe?	Queries the range value of the target waveform.	6-141
:WAVEform:RECOrd	Sets the target record number or queries the current setting.	6-142
:WAVEform:RECOrd?MINimum	Queries the minimum record number.	6-142
:WAVEform:SENd?	Queries the target waveform data (transmission).	6-142
:WAVEform:SIGN?	Queries the existence of a sign of the target waveform data.	6-144
:WAVEform:SRATe?	Sets the sample rate of the target record or queries the current setting.	6-144
:WAVEform:STARt	Sets the start data point of the target waveform or queries the current setting.	6-144
:WAVEform:TRACe	Sets the target waveform or queries the current setting.	6-144
:WAVEform:TRIGger?	Sets the trigger position of the target record or queries the current setting.	6-144
:WAVEform:TYPE?	Queries the acquisition mode of the target waveform.	6-144
XY Group		
:XY<x>?	Queries all settings related to the X-Y display.	6-145
:XY<x>:MODE	Sets the display mode or queries the current setting.	6-145
:XY<x>:TRANge	Sets the range of the T-Y waveform to be displayed on the X-Y display or queries the current setting.	6-145
:XY<x>:XAXis	Sets whether to make the channel assigned to the X-axis common or queries the current setting.	6-145
:XY<x>:XTRace	Sets the channel assigned to the X-axis or queries the current setting.	6-145
:XY<x>:YTRace	Sets the channel assigned to the Y-axis or queries the current setting.	6-146
ZOOM Group		
:ZOOM?	Queries all settings related to the waveform zoom.	6-149
:ZOOM:ALLocation?	Queries all settings related to the zoom target waveform.	6-149
:ZOOM:ALLocation:ALL	Sets all waveforms to be zoomed.	6-149
:ZOOM:ALLocation:{CHANnel<x> MATH<x> PODA PODB}	Sets the zoom target waveform or queries the current setting.	6-149
:ZOOM:ASCRoll?	Queries all settings related to the auto scroll function.	6-149
:ZOOM:ASCRoll:DIRectiOn	Sets the scroll direction of the auto scroll function or queries the current setting.	6-149
:ZOOM:ASCRoll:SPEEd	Sets the scroll speed of the auto scroll function or queries the current setting.	6-149
:ZOOM:FITMeasure	Moves the range of the automated measurement of waveform parameters to the ends of the zoom box.	6-149
:ZOOM:FORMat	Sets the zoom waveform display format or queries the current setting.	6-149
:ZOOM:MAG<x>	Sets the zoom rate of the target zoom waveform window or queries the current setting.	6-149
:ZOOM:MLINKage	Turns ON/OFF the magnification link or queries the current setting.	6-149
:ZOOM:MODE	Sets the zoom waveform display mode or queries the current setting.	6-150
:ZOOM:MOVE	Moves the zoom box to the beginning of the waveform.	6-150
:ZOOM:PLINKage	Turns ON/OFF the link when moving the zone box or queries the current setting.	6-150
:ZOOM:POSitiOn<x>	Sets the target zoom box position or queries the current setting.	6-150
:ZOOM:RATE<x>	Sets the magnification of the zoom waveform in terms of time or queries the current setting.	6-150

Command	Function	Page
Common Command Group		
*CAL?	Performs calibration and queries the result.	6-151
*CLS	Clears the standard event register, extended event register, and error queue.	6-151
*ESE	Sets the standard event enable register or queries the current setting.	6-151
*ESR?	Queries the standard event register and clears the register.	6-152
*IDN?	Queries the instrument model.	6-152
*LRN?	Queries collectively the current settings of the command group.	6-152
*OPC	Sets the bit 0 (OPC bit) of the standard event register to 1 upon the completion of the specified overlap command.	6-153
*OPC?	Creates a response after the completion of the specified overlap command.	6-153
*OPT?	Queries the options.	6-154
*PSC	Sets whether or not to clear the registers at power on or queries the current setting.	6-154
*RST	Initializes the command group settings.	6-154
*SRE	Sets the service request enable register or queries the current setting.	6-154
*STB?	Queries the status byte register.	6-154
*TST?	Performs a self-test and queries the result.	6-154
*WAI	Holds the subsequent command until the completion of the specified overlap operation.	6-154

6.2 ACQuire Group

The commands in this group deal with the waveform acquisition. You can make the same settings and inquiries as when you press the MENU key > Next 1/2 soft key > Others soft key on the front panel.



:ACQUIRE?

Function Queries all settings related to the waveform acquisition.

Syntax :ACQUIRE?

Example :ACQUIRE? -> :ACQUIRE:
 RLENGTH 10000;MODE NORMAL;
 PROTATE 1;AVERAGE:COUNT INFINITY;
 EWEIGHT 16;;ACQUIRE:COUNT INFINITY;
 CLOCK INTERNAL;RTOUT:MODE OFF;
 ANAMING DATE;FILENAME "";COMMENT ""

:ACQUIRE:AVERAge?

Function Queries all settings related to averaging.

Syntax :ACQUIRE:AVERAge?

Example :ACQUIRE:AVERAGE? ->
 :ACQUIRE:AVERAGE:
 COUNT INFINITY;EWEIGHT 16

:ACQUIRE:AVERAge:COUNT

Function Sets the waveform acquisition count when in average mode or queries the current setting.

Syntax :ACQUIRE:AVERAge:COUNT
 {<NRf>|INfInity}
 :ACQUIRE:AVERAge:COUNT?
 <NRf>=2 to 65536 (2ⁿ steps)

Example :ACQUIRE:AVERAGE:COUNT INFINITY
 :ACQUIRE:AVERAGE:COUNT? ->
 :ACQUIRE:AVERAGE:COUNT INFINITY

**:ACQUIRE:AVERAge:EWEight
(Exponent WEIGHT)**

Function Sets the attenuation constant of exponential averaging or queries the current setting.

Syntax :ACQUIRE:AVERAge:EWEight {<NRf>}
 :ACQUIRE:AVERAge:EWEight?
 <NRf>=2 to 256 (2ⁿ steps)

Example :ACQUIRE:AVERAGE:EWEIGHT 16
 :ACQUIRE:AVERAGE:EWEIGHT? ->
 :ACQUIRE:AVERAGE:EWEIGHT 16

:ACQUIRE:CLOCK

Function Sets the time base or queries the current setting.

Syntax :ACQUIRE:{INTernal|EXTernal}
 :ACQUIRE:CLOCK?

Example :ACQUIRE:CLOCK INTERNAL
 :ACQUIRE:CLOCK? ->
 :ACQUIRE:CLOCK INTERNAL

:ACQUIRE:COUNT

Function Sets the waveform acquisition count when in normal mode or queries the current setting.

Syntax :ACQUIRE:COUNT {<NRf>|INfInity}
 :ACQUIRE:COUNT?
 <NRf>=2 to 65535

Example :ACQUIRE:COUNT INFINITY
 :ACQUIRE:COUNT? -> :ACQUIRE:
 COUNT INFINITY

:ACQUIRE:MODE

Function Sets the waveform acquisition mode or queries the current setting.

Syntax :ACQUIRE:MODE
 {AVERAge|BAVERAge|ENVELOpe|NORMAL}
 :ACQUIRE:MODE?

Example :ACQUIRE:MODE NORMAL
 :ACQUIRE:MODE? -> :ACQUIRE:
 MODE NORMAL

:ACQUIRE:PROTate

Function Sets pulse/rotate when applying external clock or queries the current setting.

Syntax :ACQUIRE:PROTate {<NRf>}
 :ACQUIRE:PROTate?
 <NRf>=1 to 24000

Example :ACQUIRE:PROTATE 100
 :ACQUIRE:PROTATE? -> :ACQUIRE:
 PROTATE 100

:ACQUIRE:RTOut?

Function Queries all settings related to realtime recording.

Syntax :ACQUIRE:RTOut?
 :ACQUIRE:RTOut?

Example :ACQUIRE:RTOUT? -> :ACQUIRE:RTOUT:
 MODE HD;ANAMING DATE;COUNT 2;
 FILENAME "";COMMENT "";
 SEQUENCE SINGLE

:ACQUIRE:RTOut:ANAMing

Function Sets auto naming for realtime recording or queries the current setting.

Syntax :ACQUIRE:RTOut:ANAMing
 {DATE|NUMBERing|OFF}
 :ACQUIRE:RTOut:ANAMing?

Example :ACQUIRE:RTOUT:ANAMING NUMBERING
 :ACQUIRE:RTOUT:ANAMING? ->
 :ACQUIRE:RTOUT:ANAMING NUMBERING

:ACQUIRE:RTOut:COMMeNT

Function Sets the comment for realtime recording or queries the current setting.

Syntax :ACQUIRE:RTOut:COMMeNT <String>
 :ACQUIRE:RTOut:COMMeNT?
 <String>=Up to 160 characters

Example :ACQUIRE:RTOUT:COMMENT "XYZ"
 :ACQUIRE:RTOUT:COMMENT? ->
 :ACQUIRE:RTOUT:COMMENT "XYZ"

:ACQUIRE:RTOut:COUNT

Function Sets the number of times to perform realtime recording during continuous operation or queries the current setting.

Syntax :ACQUIRE:RTOut:COUNT {<NRf>}
 :ACQUIRE:RTOut:COUNT?
 <NRf>=2 to 128

Example :ACQUIRE:RTOUT:COUNT 5
 :ACQUIRE:RTOUT:COUNT? ->
 :ACQUIRE:RTOUT:COUNT 5

6.2 ACQuire Group/6.3 ASETup Group

:ACQuire:RTOut:FILENAME

Function Sets the file name of auto naming of realtime recording or queries the current setting.

Syntax :ACQuire:RTOut:FILENAME <String>
:ACQuire:RTOut:FILENAME?

Example :ACQUIRE:RTOUT:FILENAME "ABC"
:ACQUIRE:RTOUT:FILENAME? ->
:ACQUIRE:RTOUT:FILENAME "ABC"

:ACQuire:RTOut:MODE

Function Sets whether to perform realtime recording or queries the current setting.

Syntax :ACQuire:RTOut:MODE {HD|OFF}
:ACQuire:RTOut:MODE?

Example :ACQUIRE:RTOUT:MODE HD
:ACQUIRE:RTOUT:MODE? ->
:ACQUIRE:RTOUT:MODE HD

Description The internal hard disk is optional. If you select HD when there is no internal hard disk, an error occurs.

:ACQuire:RTOut:SEquence

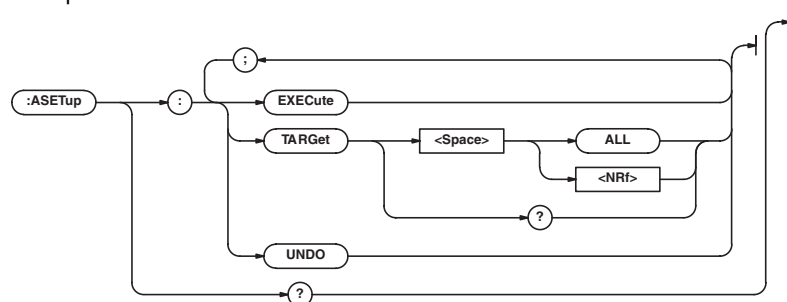
Function Sets the realtime recording operation or queries the current setting.

Syntax :ACQuire:RTOut:SEquence
{SINGLE|CONTINUE}
:ACQuire:RTOut:SEquence?

Example :ACQUIRE:RTOUT:SEQUENCE CONTINUE
:ACQUIRE:RTOUT:SEQUENCE? ->
:ACQUIRE:RTOUT:SEQUENCE CONTINUE

6.3 ASETup Group

The commands in this group deal with the auto setup. You can make the same settings, execute the same operations, and make the same inquiries as when you press the MENU key > INITIALIZE/CAL soft key on the front panel.



:ASETup?

Function Queries all settings related to auto setup.

Syntax :ASETup?

Example :ASETUP? -> :ASETUP:ADJUST ZERO;
TARGET ALL

:ASETup:EXECute

Function Execute auto setup.

Syntax :ASETup:EXECute

Example :ASETUP:EXECUTE

:ASETup:TARGet

Function Sets the target channel for auto setup or queries the current setting.

Syntax :ASETup:TARGet {ALL|<NRf>}
:ASETup:TARGet?

Example :ASETUP:TARGET ALL
:ASETUP:TARGET? -> :ASETUP:
TARGET ALL

Description An error occurs if you specify a channel in which a module is not installed.

:ASETup:UNDO

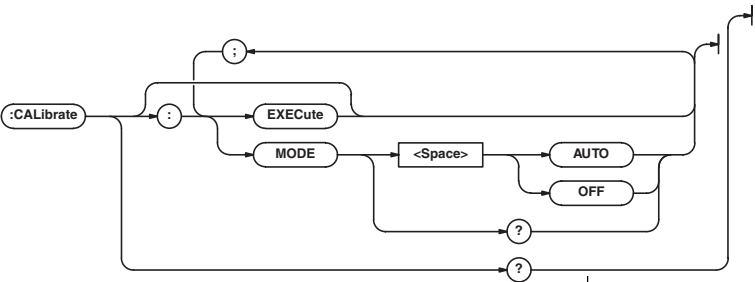
Function Cancels auto setup.

Syntax :ASETup:UNDO

Example :ASETUP:UNDO

6.4 CALibrate Group

The commands in this group deal with calibrations. You can make the same settings, execute the same operations, and make the same inquiries as when you press the MENU key > INITIALIZE/CAL soft key on the front panel.



:CALibrate?

Function Queries all settings related to the calibration.
Syntax :CALibrate?
Example :CALIBRATE? -> :CALIBRATE:MODE AUTO

:CALibrate[:EXECute]

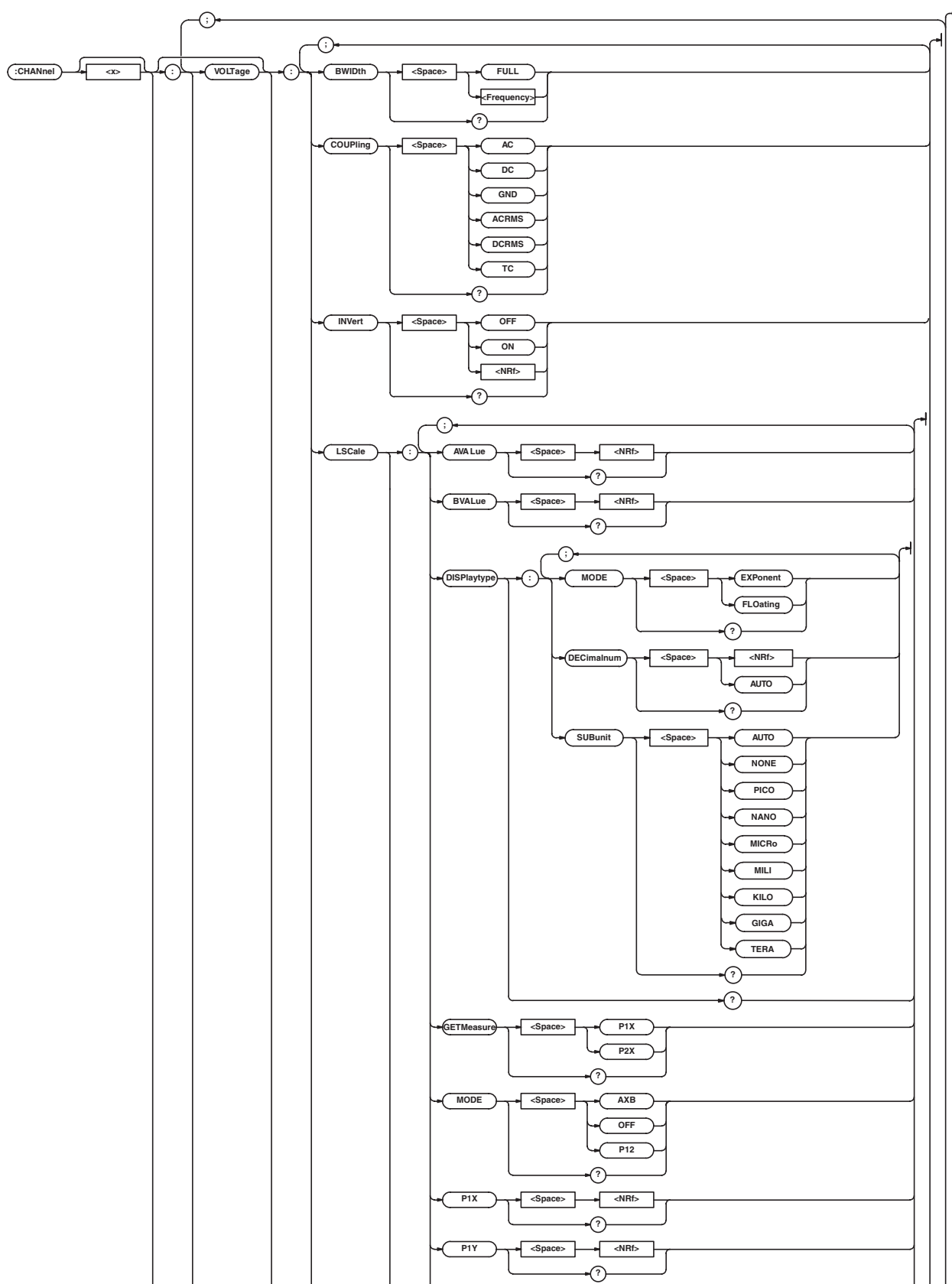
Function Executes the calibration.
Syntax :CALibrate[:EXECute]
Example :CALIBRATE:EXECUTE

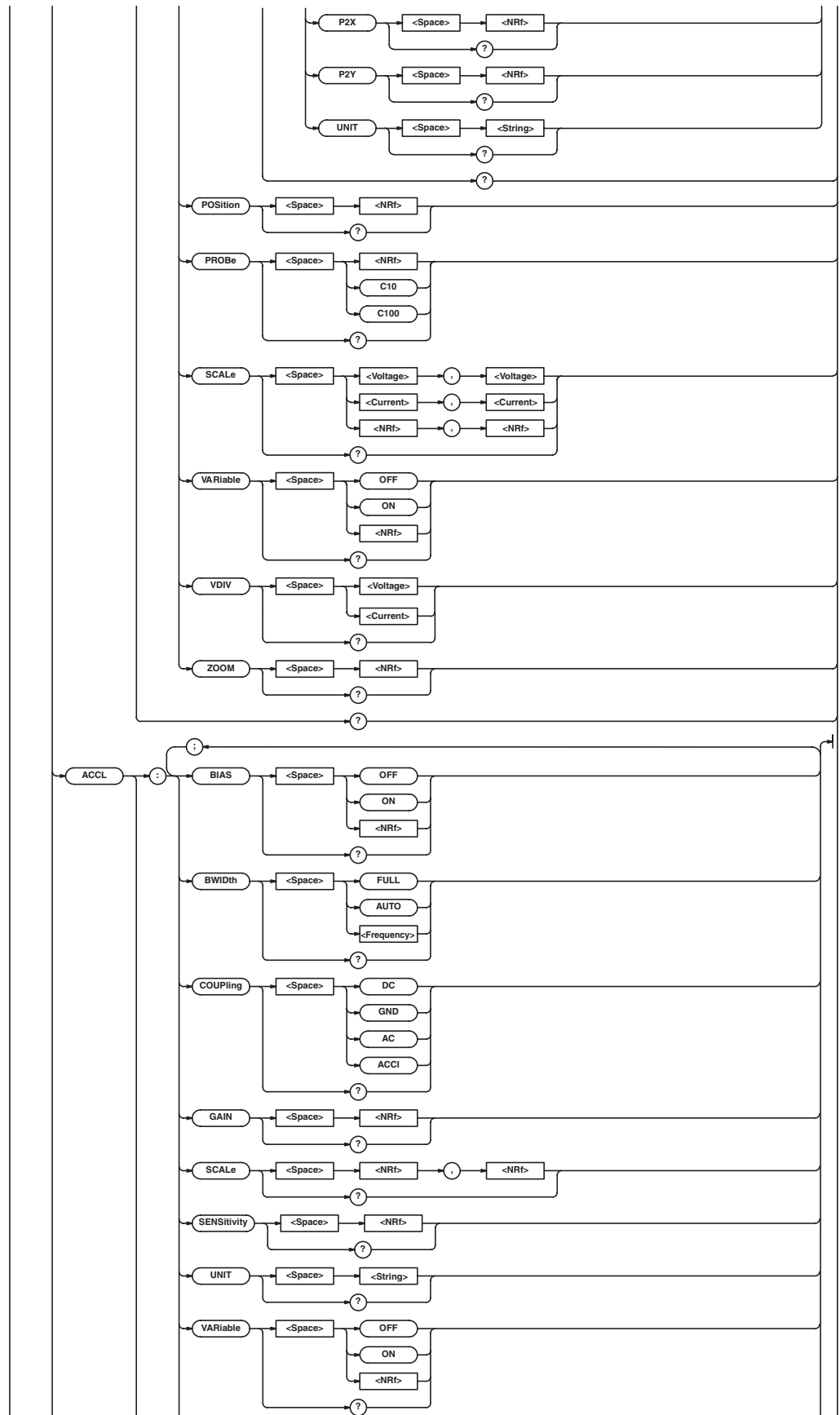
:CALibrate:MODE

Function Turns ON/OFF the auto calibration or queries the current setting.
Syntax :CALibrate:MODE {AUTO|OFF}
 :CALibrate?
Example :CALIBRATE:MODE AUTO
 :CALIBRATE? -> :CALIBRATE:MODE AUTO

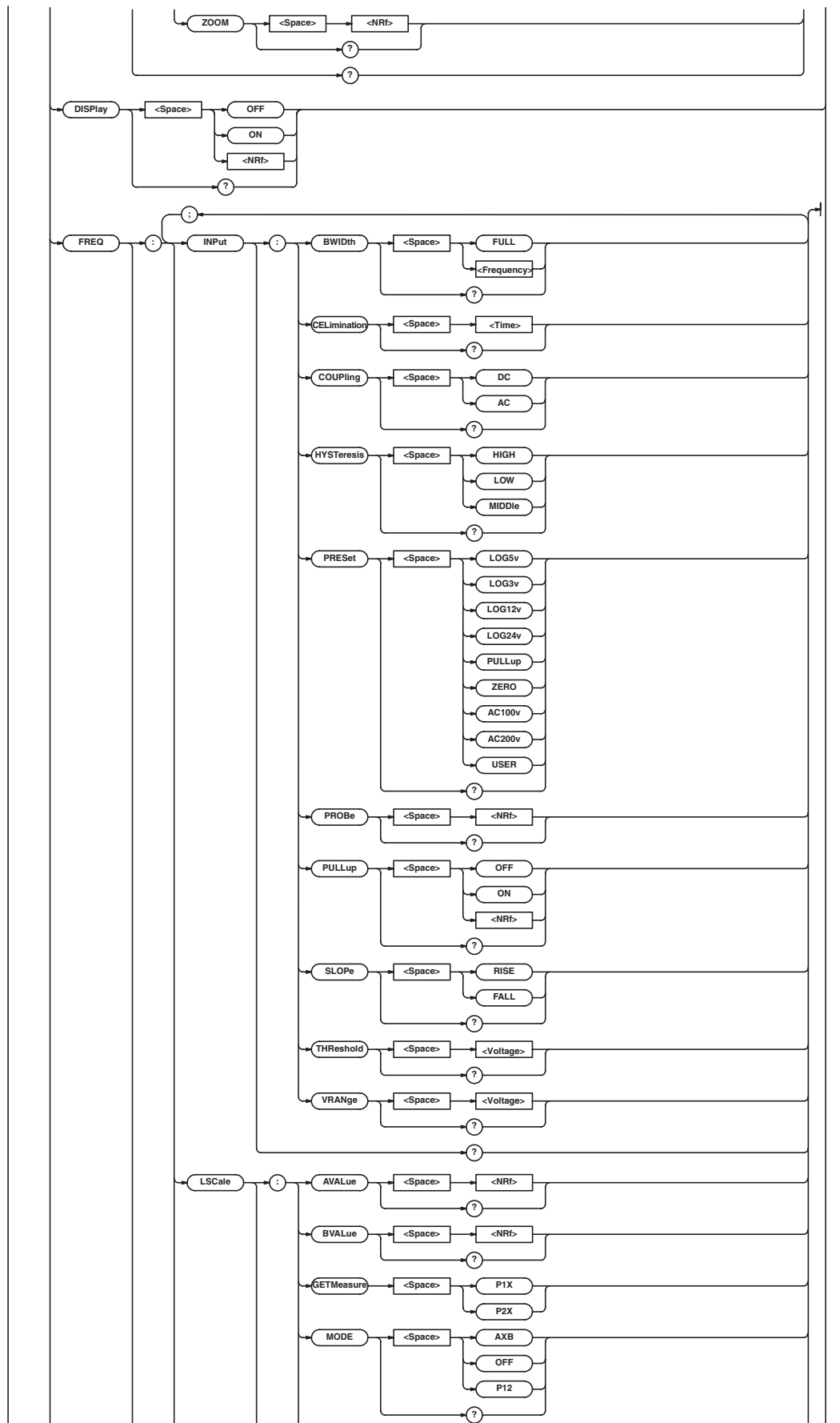
6.5 CHANnel Group

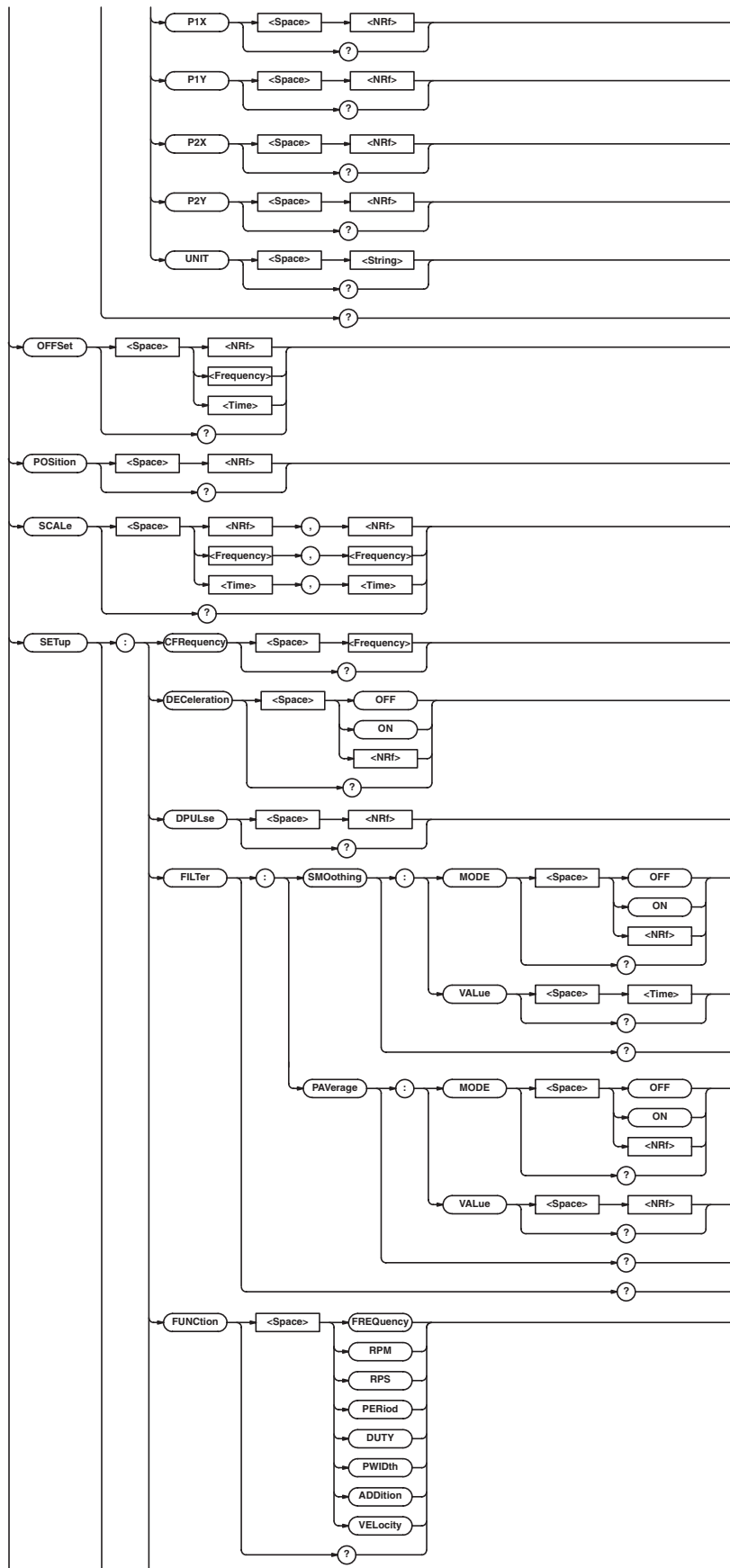
The commands in this group deal with the vertical axis of each channel. You can make the same settings and inquiries as when you press the CH key on the front panel.



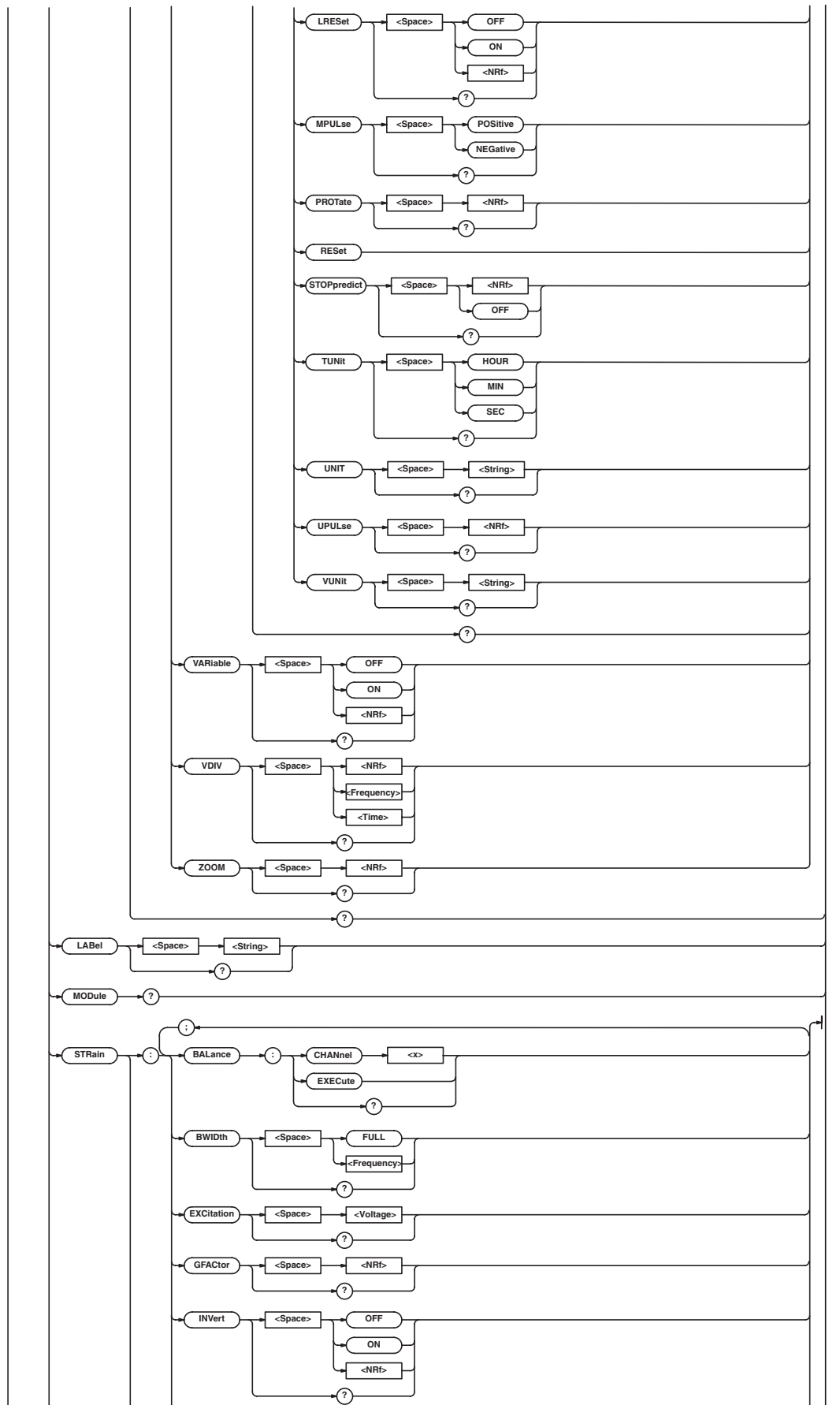


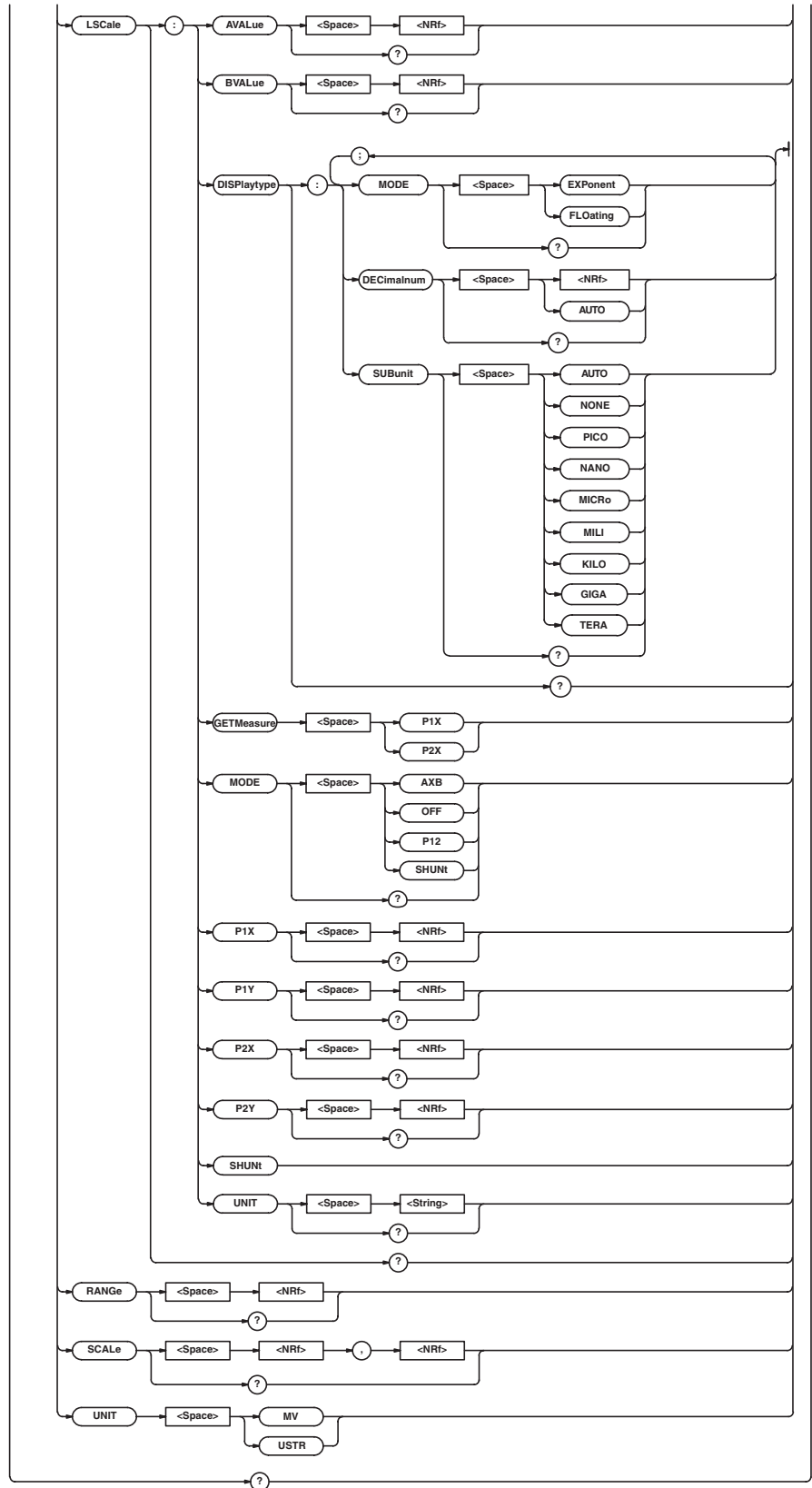
6.5 CHANnel Group

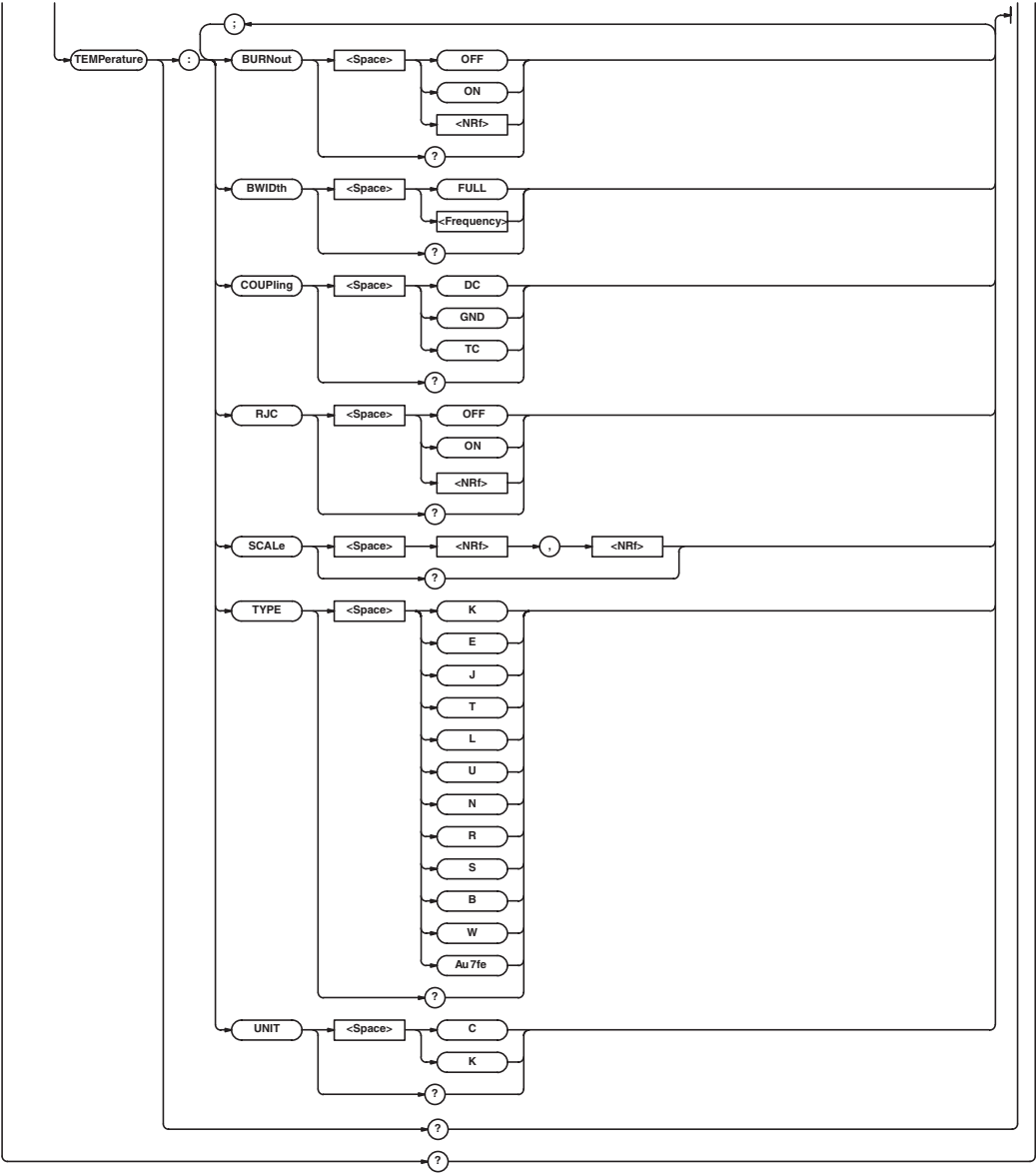




6.5 CHANnel Group







:CHANnel<x>?

Function	Queries all settings related to the vertical axis of the channel.
Syntax	:CHANnel<x>? <x>=1 to 16
Example	(The following is an example when a voltage module is installed in channel 1.) :CHANNEL1? -> :CHANNEL1:DISPLAY 1; VOLTAGE:VDIV 50.0000E+00;VARIABLE 0; COUPLING DC;PROBE 10;BWIDTh FULL; SCALE 250.000E+00,-250.000E+00; POSITION 0.00;LSCALE:MODE OFF; AVALUE 1.00000E+00; BVALUE 0.00000E+00; P1X 0.00000E+00;P1Y 0.00000E+00; P2X 1.00000E+00;P2Y 1.00000E+00; UNIT "";DISPLAYTYPE:MODE EXPONENT; DECIMALNUM AUTO;SUBUNIT AUTO;; CHANNEL1:VOLTAGE:ZOOM 1.000; INVERT 0;OFFSET 0.0E+00;; CHANNEL1:TEMPERATURE:COUPLING DC;; CHANNEL1:ACCL:COUPLING DC;; CHANNEL1:LABEL "CH1"
Description	An error occurs, if a module is not installed in the channel (slot).

:CHANnel<x>:ACCL?

Function	Queries all settings on the channel with the acceleration/voltage module installed.
Syntax	:CHANnel<x>:ACCL? <x>=1 to 16
Example	:CHANNEL11:ACCL? -> :CHANNEL11:ACCL: VARIABLE 0;COUPLING ACCL;GAIN 1.0; BWIDTh FULL;SCALE 5000.00,-5000.00; ZOOM 1.000;SENSITIVITY 1.00; UNIT "m/s ² ";BIAS 0
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:ACCL:BIAS

Function	Turns ON/OFF the bias current supply to the acceleration sensor on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:BIAS {<Boolean>} :CHANnel<x>:ACCL:BIAS? <x>=1 to 16
Example	:CHANNEL11:ACCL:BIAS ON :CHANNEL11:ACCL:BIAS? -> :CHANNEL11:ACCL:BIAS 1
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:ACCL:BWIDTh

Function	Sets the bandwidth limit on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:BWIDTh {FULL AUTO <Frequency>} :CHANnel<x>:ACCL:BWIDTh? <x>=1 to 16 <Frequency>=4 kHz, 400 Hz, or 40 Hz
Example	:CHANNEL11:ACCL:BWIDTh AUTO :CHANNEL11:ACCL:BWIDTh? -> :CHANNEL11:ACCL:BWIDTh AUTO
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:ACCL:COUPLing

Function	Sets the input coupling on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:COUPLing {AC DC ACCL GND} :CHANnel<x>:ACCL:COUPLing? <x>=1 to 16
Example	:CHANNEL11:ACCL:COUPLING GND :CHANNEL11:ACCL:COUPLING? -> :CHANNEL11:ACCL:COUPLING GND
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:ACCL:GAIN

Function	Sets the gain on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:GAIN {<Nrf>} :CHANnel<x>:ACCL:GAIN? <x>=1 to 16 <Nrf>=0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, or 100
Example	:CHANNEL11:ACCL:GAIN 100 :CHANNEL11:ACCL:GAIN? -> :CHANNEL11:ACCL:GAIN 100.0
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:ACCL:SCALE

Function	Sets the upper and lower limits on the screen on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:SCALE {<Nrf>, <Nrf>} :CHANnel<x>:ACCL:SCALE? <x>=1 to 16 <Nrf>=1000000 to -1000000
Example	:CHANNEL11:ACCL:SCALE 100,-100 :CHANNEL11:ACCL:SCALE? -> :CHANNEL11:ACCL:SCALE 100.00,- 100.00
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:ACCL:SENSitivity

Function	Sets the sensitivity on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:SENSitivity {<Nrf>} :CHANnel<x>:ACCL:SENSitivity? <x>=1 to 16 <Nrf>=0.1 to 2000
Example	:CHANNEL11:ACCL:SENSITIVITY 10 :CHANNEL11:ACCL:SENSITIVITY? -> :CHANNEL11:ACCL:SENSITIVITY 10.00
Description	An error occurs if the acceleration/voltage module is not installed.

6.5 CHANnel Group

:CHANnel<x>:ACCL:UNIT

Function	Sets the unit of upper and lower limits on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:UNIT {<String>} :CHANnel<x>:ACCL:UNIT? <x>=1 to 16 <String> = Up to 4 characters
Example	:CHANNEL11:ACCL:UNIT "ACCL" :CHANNEL11:ACCL:UNIT? -> :CHANNEL11:ACCL:UNIT "ACCL"
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:ACCL:VARIABLE

Function	Sets whether to enable Variable mode on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:VARIABLE {<Boolean>} :CHANnel<x>:ACCL:VARIABLE? <x>=1 to 16
Example	:CHANNEL11:ACCL:VARIABLE ON :CHANNEL11:ACCL:VARIABLE? -> :CHANNEL11:ACCL:VARIABLE 1
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:ACCL:ZOOM

Function	Sets the vertical zoom rate on the channel with the acceleration/voltage module installed or queries the current setting.
Syntax	:CHANnel<x>:ACCL:ZOOM {<NRf>} :CHANnel<x>:ACCL:ZOOM? <x>=1 to 16 <NRf>=0.5, 0.556, 0.625, 0.667, 0.714, 0.80, 833, 1, 1.11, 1.25, 1.33, 1.43, 1.67, 2, 2.22, 2.5, 3.33, 4, 5, 6.67, 8, 10, 12.5, 16.7, 20, 25, 40, 50, or 100
Example	:CHANNEL11:ACCL:ZOOM 0.667 :CHANNEL11:ACCL:ZOOM? -> :CHANNEL11:ACCL:ZOOM 0.667
Description	An error occurs if the acceleration/voltage module is not installed.

:CHANnel<x>:DISPlay

Function	Turns ON/OFF the waveform display of the channel or queries the current setting.
Syntax	:CHANnel<x>:DISPlay {<Boolean>} :CHANnel<x>:DISPlay? <x>=1 to 16
Example	:CHANNEL1:DISPLAY ON :CHANNEL1:DISPLAY? -> :CHANNEL1:DISPLAY 1
Description	An error occurs, if a module is not installed in the channel (slot).

:CHANnel<x>:FREQ?

Function	Queries all settings on the channel with the frequency module installed.
Syntax	:CHANnel<x>:FREQ? <x>=1 to 16
Example	CHANNEL11:FREQ? -> :CHANNEL11:FREQ: VDIV 1.00E+03;VARIABLE 0; SCALE 5.000000E+03,-5.000000E+03; POSITION 0.00;INPUT: CELIMINATION 0.000;COUPLING DC; HYSTERESIS LOW;PRESET USER; PULLUP 0;SLOPE RISE;VRANGE 10; PROBE 1;THRESHOLD 0.0E+00; BWIDTh FULL;:CHANNEL11:FREQ:LSCALE: MODE OFF;AVALUE 1.00000E+00; BVALUE 0.00000E+00;PIX 0.00000E+00; PIY 0.00000E+00;P2X 1.00000E+00; P2Y 1.00000E+00;UNIT " ";:CHANNEL11: FREQ:SETUP:DECELERATION 1; FUNCTION FREQUENCY;LRESET 0; MPULSE POSITIVE;STOPPREDICT OFF; TUNIT SEC;CFREQUENCY 50; DPULSE 1.00000E+00;PROTATE 1; UPULSE 1.00000E+00;FILTER:PAVERAGE: MODE 0;VALUE 2;:CHANNEL11:FREQ: SETUP:FILTER:SMOOTHING:MODE 0; VALUE 0.0000;:CHANNEL11:FREQ:SETUP: UNIT " ";VUNIT "m/s";:CHANNEL11: FREQ:ZOOM 1.000;OFFSET 0.000000E+00
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:INPut?

Function	Queries all settings related to the input on the channel with the frequency module installed.
Syntax	:CHANnel<x>:FREQ:INPut? <x>=1 to 16
Example	:CHANNEL15:FREQ:INPUT? -> :CHANNEL15:FREQ:INPUT:COUPLING DC; CSUPPRESS 0.100; HYSTERESIS LOW;PRESET USER; PULLUP 0;SLOPE RISE;VRANGE 10; PROBE 1;THRESHOLD 0.0E+00; BWIDTh FULL
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:INPut:BWIDTh

Function	Sets the bandwidth limit on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:INPut:BWIDTh {FULL <Frequency>} :CHANnel<x>:FREQ:INPut:BWIDTh? <x>=1 to 16 <Frequency>=100 Hz, 1 kHz, 10 kHz, or 100 kHz
Example	:CHANNEL15:FREQ:INPUT:BWIDTh FULL :CHANNEL15:FREQ:INPUT:BWIDTh? -> :CHANNEL15:FREQ:INPUT:BWIDTh FULL
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:INPUT:CELImination

Function Sets the chatter elimination on the channel with the frequency module installed or queries the current setting.

Syntax :CHANNEL<x>:FREQ:INPUT:
CELImination {<Time>}
:CHANNEL<x>:FREQ:INPUT:
CELImination?
<x>=1 to 16
<Nrf>=0 to 1000 ms

Example :CHANNEL15:FREQ:INPUT:
CELImination 100ms
:CHANNEL15:FREQ:INPUT:CELImination?
-> :CHANNEL15:FREQ:INPUT:
CELImination 0.100

Description An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:INPUT:COUpling

Function Sets the input coupling on the channel with the frequency module installed or queries the current setting.

Syntax :CHANNEL<x>:FREQ:INPUT:
COUpling {AC|DC}
:CHANNEL<x>:FREQ:INPUT:COUpling?
<x>=1 to 16

Example :CHANNEL15:FREQ:INPUT:COUpling DC
:CHANNEL15:FREQ:INPUT:COUpling? ->
:CHANNEL15:FREQ:INPUT:COUpling DC

Description An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:INPUT:HYSTeresis

Function Sets the hysteresis on the channel with the frequency module installed or queries the current setting.

Syntax :CHANNEL<x>:FREQ:INPUT:
HYSTeresis {HIGH|LOW|MIDDLE}
:CHANNEL<x>:FREQ:INPUT:HYSTeresis?
<x>=1 to 16

Example :CHANNEL15:FREQ:INPUT:
HYSTERESIS LOW
:CHANNEL15:FREQ:INPUT:HYSTERESIS?
-> :CHANNEL15:FREQ:INPUT:
HYSTERESIS LOW

Description An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:INPUT:PRESet

Function Sets the preset on the channel with the frequency module installed or queries the current setting.

Syntax :CHANNEL<x>:FREQ:INPUT:PRESet
{AC100v|AC200v|EMPichup|LOG12v|
LOG24v|LOG3v|LOG5v|PULLup|USER|ZERO}
:CHANNEL<x>:FREQ:INPUT:PRESet?
<x>=1 to 16

Example :CHANNEL15:FREQ:INPUT:PRESET USER
:CHANNEL15:FREQ:INPUT:PRESET? ->
:CHANNEL15:FREQ:INPUT:PRESET USER

Description An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:INPUT:PROBE

Function Sets the probe attenuation on the channel with the frequency module installed or queries the current setting.

Syntax :CHANNEL<x>:FREQ:INPUT:PROBE
{<Nrf>}
:CHANNEL<x>:FREQ:INPUT:PROBE?
<x>=1 to 16
<Nrf>=1 or 10

Example :CHANNEL15:FREQ:INPUT:PROBE 10
:CHANNEL15:FREQ:INPUT:PROBE? ->
:CHANNEL15:FREQ:INPUT:PROBE 10

Description An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:INPUT:PULLup

Function Turns ON/OFF the pull-up on the channel with the frequency module installed or queries the current setting.

Syntax :CHANNEL<x>:FREQ:INPUT:
PULLup {<Boolean>}
:CHANNEL<x>:FREQ:INPUT:PULLup?
<x>=1 to 16

Example :CHANNEL15:FREQ:INPUT:PULLUP ON
:CHANNEL15:FREQ:INPUT:PULLUP? ->
:CHANNEL15:FREQ:INPUT:PULLUP 1

Description An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:INPUT:SLOPe

Function Sets the slope on the channel with the frequency module installed or queries the current setting.

Syntax :CHANNEL<x>:FREQ:INPUT:SLOPe
{FALL|RISE}
:CHANNEL<x>:FREQ:INPUT:SLOPe?
<x>=1 to 16

Example :CHANNEL15:FREQ:INPUT:SLOPE FALL
:CHANNEL15:FREQ:INPUT:SLOPE? ->
:CHANNEL15:FREQ:INPUT:SLOPE FALL

Description An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:INPUT:THREshold

Function Sets the threshold level on the channel with the frequency module installed or queries the current setting.

Syntax :CHANNEL<x>:FREQ:INPUT:THREshold
{<Voltage>}
:CHANNEL<x>:FREQ:INPUT:THREshold?
<x>=1 to 16
<Voltage>=100 to -100 V

Example :CHANNEL15:FREQ:INPUT:THRESHOLD 10
:CHANNEL15:FREQ:INPUT:THRESHOLD? ->
:CHANNEL15:FREQ:INPUT:
THRESHOLD 10.000E+00

Description An error occurs if the frequency module is not installed.

6.5 CHANNEL Group

:CHANNEL<x>:FREQ:INPUT:VRANGE

Function	Sets the voltage range on the channel with the frequency module installed or queries the current setting.
Syntax	<pre>:CHANNEL<x>:FREQ:INPUT:VRANGE {<Voltage>} :CHANNEL<x>:FREQ:INPUT:VRANGE? <x>=1 to 16 <Voltage>=1 to 500 V</pre>
Example	<pre>:CHANNEL15:FREQ:INPUT:VRANGE 10 :CHANNEL15:FREQ:INPUT:VRANGE? -> :CHANNEL15:FREQ:INPUT:VRANGE 10</pre>
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:LSCale?

Function	Queries all settings related to linear scaling on the channel with the frequency module installed.
Syntax	<pre>:CHANNEL<x>:FREQ:LSCale? <x>=1 to 16</pre>
Example	<pre>:CHANNEL15:FREQ:LSCALE? -> :CHANNEL15:FREQ:LSCALE: MODE OFF;AVALUE 1.00000E+00; BVALUE 0.00000E+00; P1X0.00000E+00;P1Y 0.00000E+00; P2X 1.00000E+00; P2Y 1.00000E+00;UNIT ""</pre>
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:LSCale:AVAlue

Function	Sets the linear scaling coefficient A on the channel with the frequency module installed or queries the current setting.
Syntax	<pre>:CHANNEL<x>:FREQ:LSCale:AVAlue {<NRf>} :CHANNEL<x>:FREQ:LSCale:AVAlue? <x>=1 to 16 <NRf>=-9.9999E+30 to 9.9999E+30</pre>
Example	<pre>:CHANNEL15:FREQ:LSCALE:AVAlue 10 :CHANNEL15:FREQ:LSCALE:AVAlue? -> :CHANNEL15:FREQ:LSCALE: AVAlue 10.0000E+00</pre>
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:LSCale:BVALue

Function	Sets the linear scaling coefficient B on the channel with the frequency module installed or queries the current setting.
Syntax	<pre>:CHANNEL<x>:FREQ:LSCale:BVALue {<NRf>} :CHANNEL<x>:FREQ:LSCale:BVALue? <x>=1 to 16 <NRf>=-9.9999E+30 to 9.9999E+30</pre>
Example	<pre>:CHANNEL15:FREQ:LSCALE:BVALue 10 :CHANNEL15:FREQ:LSCALE:BVALue? -> :CHANNEL15:FREQ:LSCALE: BVALue 10.0000E+00</pre>
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:LSCale:GETMeasure

Function	Executes the measurement of the P1:X P2:X values of linear scaling on the channel with the frequency module installed.
Syntax	<pre>:CHANNEL<x>:FREQ:LSCale:GETMeasure {P1X P2X} <x>=1 to 16</pre>
Example	<pre>:CHANNEL15:FREQ:LSCALE: GETMEASURE P1X</pre>
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:LSCale:MODE

Function	Sets linear scaling on the channel with the frequency module installed or queries the current setting.
Syntax	<pre>:CHANNEL<x>:FREQ:LSCale:MODE {AXB OFF P12} :CHANNEL<x>:FREQ:LSCale:MODE? <x>=1 to 16</pre>
Example	<pre>:CHANNEL15:FREQ:LSCALE:MODE OFF :CHANNEL15:FREQ:LSCALE:MODE? -> :CHANNEL15:FREQ:LSCALE:MODE OFF</pre>
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:LSCale:{P1X|P1Y|P2X|P2Y}

Function	Sets the P1:X P1:Y P2:X P2:Y values of linear scaling on the channel with the frequency module installed or queries the current setting.
Syntax	<pre>:CHANNEL<x>:FREQ:LSCale:{P1X P1Y P2X P2Y} {<NRf>} :CHANNEL<x>:FREQ:LSCale:{P1X P1Y P2X P2Y}? <x>=1 to 16 <NRf> of P1X and P2X=-9.9999E+30 to 9.9999E+30 <NRf> of P1Y or P2Y=-9.9999E+25 to 9.9999E+25</pre>
Example	<pre>:CHANNEL15:FREQ:LSCALE:P1X 10 :CHANNEL15:FREQ:LSCALE:P1X? -> :CHANNEL15:FREQ:LSCALE: P1X 10.0000E+00</pre>
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:LSCale:UNIT

Function	Sets the unit to be added to the result of linear scaling on the channel with the frequency module installed or queries the current setting.
Syntax	<pre>:CHANNEL<x>:FREQ:LSCale:UNIT {<String>} :CHANNEL<x>:FREQ:LSCale:UNIT? <x>=1 to 16 <String>=Up to 4 characters</pre>
Example	<pre>:CHANNEL15:FREQ:LSCALE:UNIT "AAA" :CHANNEL15:FREQ:LSCALE:UNIT? -> :CHANNEL15:FREQ:LSCALE:UNIT "AAA"</pre>
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:OFFSet

Function	Sets the offset value on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:OFFSet {<NRf> <Frequency> <Time>} :CHANnel<x>:FREQ:OFFSet? <x>=1 to 16 {<NRf> <Frequency> <Time>}=The selectable range varies depending on the range setting. For details, see the <i>User's Manual</i> .
Example	:CHANNEL15:FREQ:OFFSET 1 :CHANNEL15:FREQ:OFFSET? -> :CHANNEL15:FREQ:OFFSET 1.000000E+00
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:POSition

Function	Sets the vertical position on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:POSition {<NRf>} :CHANnel<x>:FREQ:POSition? <x>=1 to 16 {<NRf>}=-5.00 to 5.00 (div, 0.01 div steps)
Example	:CHANNEL15:FREQ:POSITION 1 :CHANNEL15:FREQ:POSITION? -> :CHANNEL15:FREQ:POSITION 1.00
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SCALE

Function	Sets the upper and lower limits on the screen on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SCALE {<NRf>,<NRf> <Frequency>,<Frequency> <Time>,<Time>} :CHANnel<x>:FREQ:SCALE? <x>=1 to 16 {<NRf> <Frequency> <Time>}=The selectable range varies depending on the range setting. For details, see the <i>User's Manual</i> .
Example	:CHANNEL15:FREQ:SCALE 5,-5 :CHANNEL15:FREQ:SCALE? -> :CHAN15:FREQ: SCALE 5.000000E+00,-5.000000E+00
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup?

Function	Queries all settings related to FV setup on the channel with the frequency module installed.
Syntax	:CHANnel<x>:FREQ:SETup? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP? -> :CHANNEL15:FREQ:SETUP: FUNCTION FREQUENCY;LRESET 0; MPULSE POSITIVE;SLOWPREDICT 1; STOPPREDICT OFF;TUNIT SEC; CFREQUENCY 50;DPULSE 1.000000E+00; PROTATE 1;UPULSE1.000000E+00;FILTER: PAVERAGE:MODE 0;VALUE 2;:CHANNEL15: FREQ:SETUP:FILTER:SMOOTHING:MODE 0; VALUE 0.0100;:CHANNEL15:FREQ:SETUP: UNIT "" ;VUNIT "m/s"
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:CFrequency

Function	Sets the center frequency on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:CFrequency {<Frequency>} :CHANnel<x>:FREQ:SETup:CFrequency? <x>=1 to 16 <NRf>=50 Hz, 60 Hz, or 400 Hz
Example	:CHANNEL15:FREQ:SETUP:CFREQUENCY 50 :CHANNEL15:FREQ:SETUP:CFREQUENCY? -> :CHANNEL15:FREQ:SETUP: CFREQUENCY 50
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:DECeleration

Function	Turns ON/OFF the deceleration prediction on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:DECeleration {<Boolean>} :CHANnel<x>:FREQ:SETup: DECeleration? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP: DECELERATION ON :CHANNEL15:FREQ:SETUP:DECELERATION? -> :CHANNEL15:FREQ:SETUP: DECELERATION 1
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:DPULse

Function	Sets the distance per pulse on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:DPULse {<NRf>} :CHANnel<x>:FREQ:SETup:DPULse? <x>=1 to 16 <NRf>=9.9999E+30 to -9.9999E+30
Example	:CHANNEL15:FREQ:SETUP:DPULSE 1e15 :CHANNEL15:FREQ:SETUP:DPULSE? -> :CHANNEL15:FREQ:SETUP: DPULSE 1.000000E+15
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:FILTer?

Function	Queries all settings related to the filter on the channel with the frequency module installed.
Syntax	:CHANnel<x>:FREQ:SETup:FILTer? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:FILTER? -> :CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE: MODE 0;VALUE 2;:CHANNEL15:FREQ: SETUP:FILTER:SMOOTHING:MODE 0; VALUE 0.0100
Description	An error occurs if the frequency module is not installed.

6.5 CHANnel Group

:CHANnel<x>:FREQ:SETup:FILTer:SMOothing?

Function	Queries all settings related to smoothing on the channel with the frequency module installed.
Syntax	:CHANnel<x>:FREQ:SETup:FILTer:SMOothing? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:FILTER:SMOOTHING? ->:CHANNEL15:FREQ:SETUP:FILTER:SMOOTHING:MODE 0; VALUE 0.0100
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:FILTer:SMOothing:MODE

Function	Turns ON/OFF smoothing on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:FILTer:SMOothing:MODE {<Boolean>} :CHANnel<x>:FREQ:SETup:FILTer:SMOothing:MODE? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:FILTER:SMOOTHING:MODE ON :CHANNEL15:FREQ:SETUP:FILTER:SMOOTHING:MODE? -> :CHANNEL15:FREQ:SETUP:FILTER:SMOOTHING:MODE 1
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:FILTer:SMOothing:VALue

Function	Sets the moving average order of smoothing on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:FILTer:SMOothing:VALue {<Time>} :CHANnel<x>:FREQ:SETup:FILTer:SMOothing:VALue? <x>=1 to 16 <Time>=0 to 1000
Example	:CHANNEL15:FREQ:SETUP:FILTER:SMOOTHING:VALUE 10ms :CHANNEL15:FREQ:SETUP:FILTER:SMOOTHING:VALUE? -> :CHANNEL15:FREQ:SETUP:FILTER:SMOOTHING:VALUE 0.0100
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:FILTer:PAVerage?

Function	Queries all settings related to pulse average on the channel with the frequency module installed.
Syntax	:CHANnel<x>:FREQ:SETup:FILTer:PAVerage? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE? -> :CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE:MODE 0;VALUE 2
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:FILTer:PAVerage:MODE

Function	Turns ON/OFF pulse average on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:FILTer:PAVerage:MODE {<Boolean>} :CHANnel<x>:FREQ:SETup:FILTer:PAVerage:MODE? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE:MODE ON :CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE:MODE? -> :CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE:MODE 1
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:FILTer:PAVerage:VALue

Function	Sets the number of times to perform pulse average on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:FILTer:PAVerage:VALue {<NRf>} :CHANnel<x>:FREQ:SETup:FILTer:PAVerage:VALue? <x>=1 to 16 <NRf>=1 to 4096
Example	:CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE:VALUE 10 :CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE:VALUE? -> :CHANNEL15:FREQ:SETUP:FILTER:PAVERAGE:VALUE 10
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:SETup:FUNCTion

Function	Sets the measurement mode on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:FUNCTion {FREQuency RPM RPS PERiod DUTY PWIDTH ADDITION VELocity} :CHANnel<x>:FREQ:SETup:FUNCTion? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:FUNCTION FREQUENCY :CHANNEL15:FREQ:SETUP:FUNCTION? -> :CHANNEL15:FREQ:SETUP:FUNCTION FREQUENCY
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:SETup:LRESet

Function	Sets the over-range reset on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANNEL<x>:FREQ:SETup:LRESet {<Boolean>} :CHANNEL<x>:FREQ:SETup:LRESet? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:LRESET ON :CHANNEL15:FREQ:SETUP:LRESET? -> :CHANNEL15:FREQ:SETUP:LRESET 1
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:SETup:MPULse

Function	Sets the direction (positive or negative) of the measurement pulse on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANNEL<x>:FREQ:SETup:MPULse {POSitive NEGative} :CHANNEL<x>:FREQ:SETup:MPULse? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP: MPULSE POSITIVE :CHANNEL15:FREQ:SETUP:MPULSE? -> :CHANNEL15:FREQ:SETUP: MPULSE POSITIVE
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:SETup:PROTate

Function	Sets the number of pulses per rotation on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANNEL<x>:FREQ:SETup:PROTate {<NRf>} :CHANNEL<x>:FREQ:SETup:PROTate? <x>=1 to 16 <NRf>=1 to 99999
Example	:CHANNEL15:FREQ:SETUP:PROTATE 10 :CHANNEL15:FREQ:SETUP:PROTATE? -> :CHANNEL15:FREQ:SETUP:PROTATE 10
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:SETup:RESet

Function	Executes pulse count reset on the channel with the frequency module installed.
Syntax	:CHANNEL<x>:FREQ:SETup:RESet <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:RESET
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:SETup:STOPpredict

Function	Turns ON/OFF the stop prediction on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANNEL<x>:FREQ:SETup:STOPpredict {<NRf> OFF} :CHANNEL<x>:FREQ:SETup:STOPpredict? <x>=1 to 16 <NRf>=1.5, 2, 3, 4, 5, 6, 7, 8, 9, or 10
Example	:CHANNEL15:FREQ:SETUP: STOPPREDICT OFF :CHANNEL15:FREQ:SETUP:STOPPREDICT? -> :CHANNEL15:FREQ:SETUP: STOPPREDICT OFF
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:SETup:TUNit

Function	Sets the time unit on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANNEL<x>:FREQ:SETup:TUNit {HOUR MIN SEC} :CHANNEL<x>:FREQ:SETup:TUNit? <x>=1 to 16
Example	:CHANNEL15:FREQ:SETUP:TUNIT SEC :CHANNEL15:FREQ:SETUP:TUNIT? -> :CHANNEL15:FREQ:SETUP:TUNIT SEC
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:SETup:UNIT

Function	Sets the unit of pulse integration on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANNEL<x>:FREQ:SETup:UNIT {<String>} :CHANNEL<x>:FREQ:SETup:UNIT? <x>=1 to 16 <String>=Up to 4 characters
Example	:CHANNEL15:FREQ:SETUP:UNIT "AAA" :CHANNEL15:FREQ:SETUP:UNIT? -> :CHANNEL15:FREQ:SETUP:UNIT "AAA"
Description	An error occurs if the frequency module is not installed.

:CHANNEL<x>:FREQ:SETup:UPULse

Function	Sets the unit/pulse on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANNEL<x>:FREQ:SETup:UPULse {<NRf>} :CHANNEL<x>:FREQ:SETup:UPULse? <x>=1 to 16 <NRf>=9.9999e+30 to -9.9999e+30
Example	:CHANNEL15:FREQ:SETUP:UPULSE 1e15 :CHANNEL15:FREQ:SETUP:UPULSE? -> :CHANNEL15:FREQ:SETUP: UPULSE 1.00000E+15
Description	An error occurs if the frequency module is not installed.

6.5 CHANnel Group

:CHANnel<x>:FREQ:SETup:VUNit

Function	Sets the unit of velocity on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:SETup:VUNit {<String>} :CHANnel<x>:FREQ:SETup:VUNit? <x>=1 to 16 <String>=Up to 4 characters
Example	:CHANNEL15:FREQ:SETUP:VUNIT "BBB" :CHANNEL15:FREQ:SETUP:VUNIT? -> :CHANNEL15:FREQ:SETUP:VUNIT "BBB"
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:VARIABLE

Function	Sets whether to enable Variable mode on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:VARIABLE {<Boolean>} :CHANnel<x>:FREQ:VARIABLE? <x>=1 to 16
Example	:CHANNEL15:FREQ:VARIABLE ON :CHANNEL15:FREQ:VARIABLE? -> :CHANNEL15:FREQ:VARIABLE 1
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:FREQ:VDIV

Function	Sets the Value/Div on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:VDIV {<NRf> <Frequency> <Time>} :CHANnel<x>:FREQ:VDIV? When using communication commands, the range is set in terms of a value per division. For example, if you want to set a range of 50 Hz to channel 2, the command is :CHANnel2:FREQ:VDIV 5Hz. <x>=1 to 16 {<NRf> <Frequency> <Time>}=For details, see the <i>User's Manual</i> .
Example	:CHANNEL15:FREQ:VDIV 10Hz :CHANNEL15:FREQ:VDIV? -> :CHANNEL15:FREQ:VDIV 10.0E+00
Description	An error occurs if the frequency module is not installed. On the front panel, you specify the value for 10 divisions. However, specify the value for 1 division with this communication command.

:CHANnel<x>:FREQ:ZOOM

Function	Sets the vertical zoom rate on the channel with the frequency module installed or queries the current setting.
Syntax	:CHANnel<x>:FREQ:ZOOM {<NRf>} :CHANnel<x>:FREQ:ZOOM? <x>=1 to 16 <NRf>=0.33, 0.4, 0.5, 0.556, 0.625, 0.667, 0.714, 0.8, 0.833, 1, 1.11, 1.25, 1.33, 1.43, 1.67, 2, 2.22, 2.5, 3.33, 4, 5, 6.67, 8, 10, 12.5, 16.7, 20, 25, 40, 50, or 100
Example	:CHANNEL15:FREQ:ZOOM 10 :CHANNEL15:FREQ:ZOOM? -> :CHANNEL15:FREQ:ZOOM 10.000
Description	An error occurs if the frequency module is not installed.

:CHANnel<x>:LABEL

Function	Sets the waveform label of channel or queries the current setting.
Syntax	:CHANnel<x>:LABEL {<String>} :CHANnel<x>:LABEL? <x>=1 to 16 <String>=Up to 8 characters
Example	:CHANNEL1:LABEL "TRACE1" :CHANNEL1:LABEL? -> :CHANNEL1: LABEL "TRACE1"
Description	- Only the characters and symbols displayed on the keyboard on the screen can be used. - In ASCII code Ω and μ are expressed as 1EH and 1FH, respectively. - An error occurs, if a module is not installed in the channel (slot).

:CHANnel<x>:MODULE?

Function	Queries the module installed in the channel (slot).
Syntax	:CHANnel<x>:MODULE? <x>=1 to 16
Example	:CHANNEL1:MODULE? -> :CHANNEL1: MODULE M701250
Description	The following values are returned from the module.
NOMODULE	No module
M701250	701250 (HS10M12)
M701251	701251 (HS1M16)
M701255	701255 (NONISO_10M12)
M701260	701260 (HV(with RMS))
M701261	701261 (UNIV)
M701262	701262 (UNIV_AAF)
M701265	701265 (TEMP/HPV)
M701270	701270 (STRAIN_NDIS)
M701271	701271 (STRAIN_DSUB)
M701275	701275 (ACCL/VOLT)
M701280	701280 (FREQ)

:CHANnel<x>:STRAIN?

Function	Queries all settings related to the strain module on the channel with the strain module installed.
Syntax	:CHANnel<x>:STRAIN? <x>=1 to 16
Example	:CHANNEL7:STRAIN? -> :CHANNEL7:STRAIN:SCALE 20000, -20000;RANGE 20000;UNIT USTR; EXCITATION 2.000000E+00; GFACTOR 2.00;BWIDTH FULL; BALANCE:CHANNEL1 0;CHANNEL2 0; CHANNEL3 0;CHANNEL4 0;CHANNEL5 0; CHANNEL6 0;CHANNEL7 1;CHANNEL8 1; CHANNEL9 0;CHANNEL10 0;CHANNEL11 0; CHANNEL12 0;CHANNEL13 1; CHANNEL14 1;CHANNEL15 0; CHANNEL16 0;:CHANNEL7: STRAIN:LSCALE:MODE OFF; AVALUE 1.000000E+00; BVALUE 0.000000E+00; P1X 0.000000E+00;P1Y 0.000000E+00; P2X 1.000000E+00;P2Y 1.000000E+00; UNIT " ";DISPLAYTYPE:MODE EXPONENT; DECIMALNUM AUTO;SUBUNIT AUTO;; CHANNEL7:STRAIN:INVERT 1
Description	An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:BALANCE?

Function Queries the balance setting on the channel with the strain module installed.

Syntax :CHANNEL<x>:STRAIN:BALANCE?
<x>=1 to 16

Example :CHANNEL7:STRAIN:BALANCE? ->
:CHANNEL7:STRAIN:BALANCE:
CHANNEL1 0;CHANNEL2 0;
CHANNEL3 0;CHANNEL4 0;
CHANNEL5 0;CHANNEL6 0;
CHANNEL7 1;CHANNEL8 1;
CHANNEL9 0;CHANNEL10 0;
CHANNEL11 0;CHANNEL12 0;
CHANNEL13 0;CHANNEL14 0;
CHANNEL15 0;CHANNEL16 0

Description An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:BALANCE:CHANNEL<x>

Function Sets the channel on which to execute the balance on the channel with the strain module installed or queries the current setting.

Syntax :CHANNEL<x>:STRAIN:BALANCE:
CHANNEL<x> {<Boolean>}
:CHANNEL<x>:STRAIN:BALANCE:CHANNEL?
<x>=1 to 16

Example :CHANNEL7:STRAIN:BALANCE:
CHANNEL7 ON
:CHANNEL7:STRAIN:BALANCE:CHANNEL7?
-> :CHANNEL7:STRAIN:BALANCE:
CHANNEL7 1

Description An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:BALANCE:EXECUTE

Function Executes the balance on the channel with the strain module installed.

Syntax :CHANNEL<x>:STRAIN:BALANCE:EXECUTE
<x>=1 to 16

Example :CHANNEL7:STRAIN:BALANCE:EXECUTE

Description • Balance is executed on channels that are turned ON with the :CHANNEL<x>:STRAIN:BALANCE:CHANNEL<x> command.
• An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:BWIDTh {FULL|<Frequency>}

Function Sets the filter on the channel with the strain module installed or queries the current setting.

Syntax :CHANNEL<x>:STRAIN:BWIDTh
{FULL|<Frequency>}
:CHANNEL<x>:STRAIN:BWIDTh?
<x>=1 to 16

Example <Frequency>=10 Hz, 100 Hz, or 1 kHz
:CHANNEL7:STRAIN:BWIDTh FULL
:CHANNEL7:STRAIN:BWIDTh? ->
:CHANNEL7:STRAIN:BWIDTh FULL

Description An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:EXCitation {<Voltage>}

Function Sets the bridge voltage on the channel with the strain module installed or queries the current setting.

Syntax :CHANNEL<x>:STRAIN:EXCitation
{<Voltage>}
:CHANNEL<x>:STRAIN:EXCitation?
<x>=1 to 16
<Voltage>=2 V, 5 V, or 10 V

Example :CHANNEL7:STRAIN:EXCITATION 2V
:CHANNEL7:STRAIN:EXCITATION? ->
:CHANNEL7:STRAIN:
EXCITATION 2.000000E+00

Description An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:GFACTOR {<NRf>}

Function Sets the gauge factor on the channel with the strain module installed or queries the current setting.

Syntax :CHANNEL<x>:STRAIN:GFACTOR {<NRf>}
:CHANNEL<x>:STRAIN:GFACTOR?
<x>=1 to 16
<NRf>=1.90 to 2.20

Example :CHANNEL7:STRAIN:GFACTOR 2.00
:CHANNEL7:STRAIN:GFACTOR? ->
:CHANNEL7:STRAIN:GFACTOR 2.00

Description An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:INVERT

Function Sets whether to invert the waveform on the channel with the strain module installed or queries the current setting.

Syntax :CHANNEL<x>:STRAIN:INVERT
{<Boolean>}
:CHANNEL<x>:STRAIN:INVERT?
<x>=1 to 16

Example :CHANNEL7:STRAIN:INVERT ON
:CHANNEL7:STRAIN:INVERT? ->
:CHANNEL7:STRAIN:INVERT 1

Description An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:LSCale?

Function Queries all settings related to linear scaling on the channel with the strain module installed.

Syntax :CHANNEL<x>:STRAIN:LSCale?
<x>=1 to 16

Example :CHANNEL7:STRAIN:LSCALE? ->
:CHANNEL7:STRAIN:LSCALE:MODE OFF;
AVALUE 1.000000E+00;
BVALUE 0.000000E+00;P1X 0.000000E+00;
P1Y 0.000000E+00;P2X 1.000000E+00;
P2Y 1.000000E+00;UNIT "";
DISPLAYTYPE:MODE EXPONENT;
DECIMALNUM AUTO;SUBUNIT AUTO

Description An error occurs if the strain module is not installed.

6.5 CHANnel Group

:CHANnel<x>:STRain:LSCale:AVALue {<Nrf>}

Function	Sets scaling coefficient A on the channel with the strain module installed or queries the current setting.
Syntax	:CHANnel<x>:STRain:LSCale:AVALue {<Nrf>} :CHANnel<x>:STRain:LSCale:AVALue? <x>=1 to 16 <Nrf>=-9.9999E+30 to 9.9999E+30
Example	:CHANNEL7:STRAIN:LSCALE:AVALUE 10 :CHANNEL7:STRAIN:LSCALE:AVALUE? -> :CHANNEL7:STRAIN:LSCALE: AVALUE 10.0000E+00
Description	An error occurs if the strain module is not installed.

:CHANnel<x>:STRain:LSCale:BVALue {<Nrf>}

Function	Sets offset value B on the channel with the strain module installed or queries the current setting.
Syntax	:CHANnel<x>:STRain:LSCale:BVALue {<Nrf>} :CHANnel<x>:STRain:LSCale:BVALue? <x>=1 to 16 <Nrf>=-9.9999E+30 to 9.9999E+30
Example	:CHANNEL7:STRAIN:LSCALE:BVALUE 5 :CHANNEL7:STRAIN:LSCALE:BVALUE? -> :CHANNEL7:STRAIN:LSCALE: BVALUE 5.00000E+00
Description	An error occurs if the strain module is not installed.

:CHANnel<x>:STRain:LSCale:DISPlaytype?

Function	Queries all settings related to the display type when using linear scaling.
Syntax	:CHANnel<x>:STRain:LSCale:DISPlaytype? <x>=1 to 16
Example	:CHANNEL7:STRAIN:LSCALE: DISPLAYTYPE? -> :CHANNEL7:STRAIN:LSCALE:DISPLAYTYPE: MODE EXPONENT;DECIMALNUM AUTO; SUBUNIT AUTO

:CHANnel<x>:STRain:LSCale:DISPlaytype:MODE

Function	Sets the display mode when using linear scaling or queries the current setting.
Syntax	:CHANnel<x>:STRain:LSCale:DISPlaytype:MODE {EXPonent FLOating} :CHANnel<x>:STRain:LSCale:DISPlaytype:MODE? <x>=1 to 16
Example	:CHANNEL7:STRAIN:LSCALE: DISPLAYTYPE:MODE EXPONENT :CHANNEL7:STRAIN:LSCALE:DISPLAYTYPE: MODE? -> :CHENNEL7:STRAIN:LSCALE:DISPLAYTYPE: MODE EXPONENT

:CHANnel<x>:STRain:LSCale:DISPlaytype:DECimalnum

Function	Sets the decimal place when the display type is Float when using linear scaling or queries the current setting.
Syntax	:CHANnel<x>:STRain:LSCale:DISPlaytype:DECimalnum {<Nrf> AUTO} :CHANnel<x>:STRain:LSCale:DISPlaytype:DECimalnum? <Nrf>=0 to 3
Example	:CHANNEL7:STRAIN:LSCALE: DISPLAYTYPE:DECIMALNUM AUTO :CHANNEL7:STRAIN:LSCALE: DISPLAYTYPE:DECIMALNUM? -> :CHANNEL7:STRAIN:LSCALE: DISPLAYTYPE:DECIMALNUM AUTO

:CHANnel<x>:STRain:LSCale:DISPlaytype:SUBunit

Function	Sets the sub unit when the display type is Float when using linear scaling or queries the current setting.
Syntax	:CHANnel<x>:STRain:LSCale:DISPlaytype:SUBunit {AUTO NONE PICO NANO MICRO MILI KILO MEGA GIGA TERA} :CHANnel<x>:STRain:LSCale:DISPlaytype:SUBunit? <x>=1 to 16
Example	:CHANNEL7:STRAIN:LSCALE: DISPLAYTYPE:SUBUNIT AUTO :CHANNEL7:STRAIN:LSCALE: DISPLAYTYPE:SUBUNIT? -> :CHANNEL7:STRAIN:LSCALE: DISPLAYTYPE:SUBUNIT AUTO

:CHANnel<x>:STRain:LSCale:GETMeasure {P1X|P2X}

Function	Executes the measurement of the P1:X P2:X values of linear scaling on the channel with the strain module installed.
Syntax	:CHANnel<x>:STRain:LSCale:GETMeasure {P1X P2X} <x>=1 to 16
Example	:CHANNEL7:STRAIN:LSCALE: GETMeasure P1X
Description	An error occurs if the strain module is not installed.

:CHANnel<x>:STRain:LSCale:MODE {AXB|OFF|P12|SHUNT}

Function	Sets the linear scaling mode on the channel with the strain module installed or queries the current setting. (SHUNT can be specified only on the Strain Module (DSUB, Shunt-Cal).)
Syntax	:CHANnel<x>:STRain:LSCale:MODE {AXB OFF P12 SHUNT} :CHANnel<x>:STRain:LSCale:MODE? <x>=1 to 16
Example	:CHANNEL7:STRAIN:LSCALE:MODE AXB :CHANNEL7:STRAIN:LSCALE:MODE? -> :CHANNEL7:STRAIN:LSCALE:MODE AXB
Description	An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:LSCALE:{P1X|P1Y|P2X|P2Y}

Function	Sets the P1:X P1:Y P2:X P2:Y values of linear scaling on the channel with the strain module installed or queries the current setting.
Syntax	:CHANNEL<x>:STRAIN:LSCALE:{P1X P1Y P2X P2Y} {<Nrf>} :CHANNEL<x>:STRAIN:LSCALE:{P1X P1Y P2X P2Y}? <x>=1 to 16 <Nrf> of P1X and P2X=-9.9999E+30 to 9.9999E+30 <Nrf> of P1Y and P2Y=-9.9999E+25 to 9.9999E+25
Example	:CHANNEL7:STRAIN:LSCALE:P1X 10 :CHANNEL7:STRAIN:LSCALE:P1X? -> :CHANNEL7:STRAIN:LSCALE: P1X 10.0000E+00
Description	An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:LSCALE:SHUNT

Function	Executes the shunt calibration on the channel with the strain module installed. (only on the Strain Module (DSUB, Shunt-Cal))
Syntax	:CHANNEL<x>:STRAIN:LSCALE:SHUNT <x>=1 to 16
Example	:CHANNEL7:STRAIN:LSCALE:SHUNT
Description	An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:LSCALE:UNIT {<String>}

Function	Sets the unit to be added to the result of linear scaling on the channel with the strain module installed or queries the current setting.
Syntax	:CHANNEL<x>:STRAIN:LSCALE:UNIT {<String>} :CHANNEL<x>:STRAIN:LSCALE:UNIT? <x>=1 to 16 <String>=Up to 4 characters
Example	:CHANNEL7:STRAIN:LSCALE:UNIT "X" :CHANNEL7:STRAIN:LSCALE:UNIT? -> :CHANNEL7:STRAIN:LSCALE:UNIT "X"
Description	An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:RANGE {<Nrf>}

Function	Sets the measurement range on the channel with the strain module installed or queries the current setting.
Syntax	:CHANNEL<x>:STRAIN:RANGE {<Nrf>} :CHANNEL<x>:STRAIN:RANGE? <x>=1 to 16 <Nrf>=0.25, 0.5, 1, 2.5, 5, or 10 (for mV/V) 500, 1000, 2000, 5000, 10000, 20000 (for μ STR)
Example	:CHANNEL7:STRAIN:RANGE 5000 :CHANNEL7:STRAIN:RANGE? -> :CHANNEL7:STRAIN:RANGE 5000
Description	An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:SCALE {<Nrf>,<Nrf>}

Function	Sets the upper and lower limits on the screen on the channel with the strain module installed or queries the current setting.
Syntax	:CHANNEL<x>:STRAIN:SCALE {<Nrf>,<Nrf>} :CHANNEL<x>:STRAIN:SCALE? <x>=1 to 16 <Nrf>=-15.0000 to 15.0000 (for mV/V) -30000 to 30000 (for μ STR) -9.9999E+30 to 9.9999E+30 (for linear scaling)
Example	:CHANNEL7:STRAIN:SCALE -8,8 :CHANNEL7:STRAIN:SCALE? -> :CHANNEL7:STRAIN: SCALE 8.0000,-8.0000
Description	An error occurs if the strain module is not installed.

:CHANNEL<x>:STRAIN:UNIT {MV|USTR}

Function	Sets the unit on the channel with the strain module installed or queries the current setting.
Syntax	:CHANNEL<x>:STRAIN:UNIT {MV USTR} :CHANNEL<x>:STRAIN:UNIT? <x>=1 to 16
Example	:CHANNEL7:STRAIN:UNIT USTR :CHANNEL7:STRAIN:UNIT? -> :CHANNEL7:STRAIN:UNIT USTR
Description	An error occurs if the strain module is not installed.

:CHANNEL<x>:TEMPERATURE?

Function	Queries all settings on the channel with the Temperature, High Precision Voltage Isolation Module installed.
Syntax	:CHANNEL<x>:TEMPERATURE? <x>=1 to 16
Example	:CHANNEL1:TEMPERATURE? -> :CHANNEL1:TEMPERATURE:COUPLING TC; TYPE K;BWIDTH FULL; SCALE 1300.0,-200.0;UNIT C; RJC 1;BURNOUT 0
Description	An error occurs if the Temperature, High Precision Voltage Isolation, or Universal Module is not installed.

:CHANNEL<x>:TEMPERATURE:BURNout

Function	Sets whether to detect burnouts on the channel with the Temperature, High Precision Voltage Isolation Module installed or queries the current setting.
Syntax	:CHANNEL<x>:TEMPERATURE:BURNout {<Boolean>}
Example	:CHANNEL1:TEMPERATURE:BURNOUT ON :CHANNEL1:TEMPERATURE:BURNOUT? -> :CHANNEL1:TEMPERATURE:BURNOUT 1
Description	An error occurs if the Temperature, High Precision Voltage Isolation, or Universal Module is not installed.

6.5 CHANnel Group

:CHANnel<x>:TEMPerature:BWIDth

Function	Sets the bandwidth limit on the channel with the Temperature, High Precision Voltage Isolation Module installed or queries the current setting.
Syntax	<pre>:CHANnel<x>:TEMPerature:BWIDth {FULL <Frequency>} :CHANnel<x>:TEMPerature:BWIDth? <x>=1 to 16 <Frequency>=2, 8, 30 (Hz)</pre>
Example	<pre>:CHANNEL1:TEMPERATURE:BWIDTh 2.0Hz :CHANNEL1:TEMPERATURE:BWIDTh? -> :CHANNEL1:TEMPERATURE: BWIDTh 2.0E+00</pre>
Description	An error occurs if the Temperature, High Precision Voltage Isolation, or Universal Module is not installed.

:CHANnel<x>:TEMPerature:COUPling

Function	Sets the input coupling on the channel with the Temperature, High Precision Voltage Isolation Module installed or queries the current setting.
Syntax	<pre>:CHANnel<x>:TEMPerature:COUPling {TC DC GND} :CHANnel<x>:TEMPerature:COUPling? <x>=1 to 16</pre>
Example	<pre>:CHANNEL1:TEMPERATURE:COUPLING DC :CHANNEL1:TEMPERATURE:COUPLING? -> :CHANNEL1:TEMPERATURE:COUPLING DC</pre>
Description	An error occurs if the Temperature, High Precision Voltage Isolation, or Universal Module is not installed.

:CHANnel<x>:TEMPerature:RJC

Function	Sets the RJC on the channel with the Temperature, High Precision Voltage Isolation Module installed or queries the current setting.
Syntax	<pre>:CHANnel<x>:TEMPerature:RJC {<Boolean>} :CHANnel<x>:TEMPerature:RJC? <x>=1 to 16</pre>
Example	<pre>:CHANNEL1:TEMPERATURE:RJC ON :CHANNEL1:TEMPERATURE:RJC? -> :CHANNEL1:TEMPERATURE:RJC 1</pre>
Description	An error occurs if the Temperature, High Precision Voltage Isolation, or Universal Module is not installed.

:CHANnel<x>:TEMPerature:SCALE

Function	Sets the upper and lower limits on the screen on the channel with the Temperature, High Precision Voltage Isolation Module installed or queries the current setting.
Syntax	<pre>:CHANnel<x>:TEMPerature:SCALE {<NRf>,<NRf>} :CHANnel<x>:TEMPerature:SCALE? <x>=1 to 16 <NRf>=-5432 to 5432 (0.1°C steps)</pre>
Example	<pre>:CHANNEL1:TEMPERATURE: SCALE 1200.0,-200.0 :CHANNEL1:TEMPERATURE:SCALE? -> :CHANNEL1:TEMPERATURE: SCALE 1200.0,-200.0</pre>
Description	- The unit of the value is the unit specified by :CHANnel<x>:TEMPerature:UNIT. - An error occurs if the Temperature, High Precision Voltage Isolation, or Universal Module is not installed.

:CHANnel<x>:TEMPerature:TYPE

Function	Sets the thermocouple type to be used on the channel with the Temperature, High Precision Voltage Isolation Module installed or queries the current setting.
Syntax	<pre>:CHANnel<x>:TEMPerature:TYPE {K E J T L U N R S B W Au7fe} :CHANnel<x>:TEMPerature:TYPE? <x>=1 to 16</pre>
Example	<pre>:CHANNEL1:TEMPERATURE:TYPE K :CHANNEL1:TEMPERATURE:TYPE? -> :CHANNEL1:TEMPERATURE:TYPE K</pre>
Description	An error occurs if the Temperature, High Precision Voltage Isolation, or Universal Module is not installed.

:CHANnel<x>:TEMPerature:UNIT

Function	Sets the unit of the upper and lower limits on the channel with the Temperature, High Precision Voltage Isolation Module installed or queries the current setting.
Syntax	<pre>:CHANnel<x>:TEMPerature:UNIT {C F K} :CHANnel<x>:TEMPerature:UNIT? <x>=1 to 16</pre>
Example	<pre>:CHANNEL1:TEMPERATURE:UNIT C :CHANNEL1:TEMPERATURE:UNIT? -> :CHANNEL1:TEMPERATURE:UNIT C</pre>
Description	An error occurs if the Temperature, High Precision Voltage Isolation, or Universal Module is not installed.

:CHANnel<x>:UNIT?

Function	Queries the unit added to the channel.
Syntax	<pre>:CHANnel<x>:UNIT? <x> = 1 to 16</pre>
Example	(When a voltage module is installed in channel 7 (slot 3) and the coupling is DC) <pre>:CHANNEL7:UNIT? -> :CHANNEL7: UNIT "V"</pre>

:CHANnel<x>:VOLTAge?

Function	Queries all settings on the channel with the voltage module installed.
Syntax	<pre>:CHANnel<x>:VOLTAge? <x>=1 to 16</pre>
Example	<pre>:CHANNEL1:VOLTAGE? -> :CHANNEL1:VOLTAGE:VDIV 50.000E+00; VARIABLE 0;COUPLING DC;PROBE 10; BWIDTh FULL;SCALE 250.000E+00, -250.000E+00;POSITION 0.00; LSCALE:MODE OFF;AVALUE 1.00000E+00; BVALUE 0.00000E+00;P1X 0.00000E+00; P1Y 0.00000E+00;P2X 1.00000E+00; P2Y 1.00000E+00;UNIT ""; DISPLAYTYPE:MODE EXPONENT; DECIMALNUM AUTO;SUBUNIT AUTO;; CHANNEL1:VOLTAGE:ZOOM 1.000; INVERT 0;OFFSET 0.0E+00</pre>
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:BWIDth

Function	Sets the bandwidth limit on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:BWIDth {FULL <Frequency>} :CHANnel<x>[:VOLTage]:BWIDth? <x>=1 to 16 <Frequency>=500 Hz, 5 kHz, 50 kHz, or 500 kHz (M701250/M701255) 400 Hz, 4 kHz, or 40 kHz (M701251) 2 Hz, 8 Hz, or 30 Hz (M701265) 100 Hz, 1 kHz, or 10 kHz (M701260) 4 kHz, 400 Hz, 40 Hz (M701261, when coupling other than TC) 30 Hz, 8 Hz, 2 Hz (M701261/M701262, when coupling is TC) Auto, 4 kHz, 400 Hz, 40 Hz (M701262, when coupling other than TC)
Example	:CHANNEL1:VOLTAGE:BWIDTH FULL :CHANNEL1:VOLTAGE:BWIDTH? -> :CHANNEL1: VOLTAGE:BWIDTH FULL
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:COUPling

Function	Sets the input coupling on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:COUPling {AC DC GND ACRMS DCRMS TC} :CHANnel<x>[:VOLTage]:COUPling? <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:COUPLING DC :CHANNEL1:VOLTAGE:COUPLING? -> :CHANNEL1:VOLTAGE:COUPLING DC
Description	- An error occurs if the voltage module is not installed. - The TC, ACRMS, and DCRMS settings are not available on the M701250/M701251/M701255. - The AC, ACRMS, and DCRMS settings are not available on the M701265. - The ACRMS and DCRMS settings are not available on the M701261/M701262.

:CHANnel<x>[:VOLTage]:INVert

Function	Sets whether to invert the waveform on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:INVert {<Boolean>} :CHANnel<x>[:VOLTage]:INVert? <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:INVERT ON :CHANNEL1:VOLTAGE:INVERT? -> :CHANNEL1:VOLTAGE:INVERT 1
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:LSCale?

Function	Queries all settings related to linear scaling on the channel with the voltage module installed.
Syntax	:CHANnel<x>[:VOLTage]:LSCale? <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:LSCALE? -> :CHANNEL1:VOLTAGE:LSCALE:MODE OFF; AVALUE 1.00000E+00; BVALUE 0.00000E+00;P1X 0.00000E+00; P1Y 0.00000E+00;P2X 1.00000E+00; P2Y 1.00000E+00;UNIT ""; DISPLAYTYPE:MODE EXPONENT; DECIMALNUM AUTO;SUBUNIT AUTO
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:LSCale:AVALue

Function	Sets scaling coefficient A of linear scaling on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:AVALue {<Nrf>} :CHANnel<x>[:VOLTage]:LSCale: AVALue? <x>=1 to 16 <Nrf>=-9.9999E+30 to 9.9999E+30
Example	:CHANNEL1:VOLTAGE:LSCALE:AVALUE 10 :CHANNEL1:VOLTAGE:LSCALE:AVALUE? -> :CHANNEL1:VOLTAGE:LSCALE: AVALUE 10.0000E+00
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:LSCale:BVALue

Function	Sets offset B of linear scaling on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:BVALue {<Nrf>} :CHANnel<x>[:VOLTage]:LSCale: BVALue? <x>=1 to 16 <Nrf>=-9.9999E+30 to 9.9999E+30
Example	:CHANNEL1:VOLTAGE:LSCALE:BVALUE 10 :CHANNEL1:VOLTAGE:LSCALE:BVALUE? -> :CHANNEL1:VOLTAGE:LSCALE: BVALUE 10.0000E+00
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:LSCale:**DISPlaytype?**

Function	Queries all settings related to the display type when using linear scaling.
Syntax	:CHANnel<x>[:VOLTage]:LSCALE: DISPlayTYPE? <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:LSCALE: DISPlayTYPE? -> :CHANNEL1:VOLTAGE:LSCALE: DISPlayTYPE:MODE EXPONENT; DECIMALNUM AUTO;SUBUNIT AUTO

6.5 CHANnel Group

:CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:MODE

Function	Sets the display mode when using linear scaling or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:MODE {EXPonent FLOating} :CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:MODE? <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:MODE EXPONENT :CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:MODE? -> :CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:MODE EXPONENT

:CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:DECimalnum

Function	Sets the decimal place when the display type is Float when using linear scaling or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:DECimalnum {<Nrf> AUTO} :CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:DECimalnum? <Nrf>=0 to 3
Example	:CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:DECIMALNUM AUTO :CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:DECIMALNUM? -> :CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:DECIMALNUM AUTO

:CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:SUBunit

Function	Sets the sub unit when the display type is Float when using linear scaling or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:SUBunit {AUTO NONE PICO NANO MICRO MILI KILO MEGA GIGA TERA} :CHANnel<x>[:VOLTage]:LSCale:DISPlaytype:SUBunit? <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:SUBUNIT AUTO :CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:SUBUNIT? -> :CHANNEL1:VOLTAGE:LSCALE:DISPLAYTYPE:SUBUNIT AUTO

:CHANnel<x>[:VOLTage]:LSCale:GETMeasure

Function	Executes the measurement of the P1:X P2:X values of linear scaling on the channel with the voltage module installed.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:GETMeasure {P1X P2X} <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:GETMeasure P1X
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:LSCale:MODE

Function	Sets the linear scaling function on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:MODE {AXB OFF P12} :CHANnel<x>[:VOLTage]:LSCale:MODE? <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:LSCALE:MODE AXB :CHANNEL1:VOLTAGE:LSCALE:MODE? -> :CHANNEL1:VOLTAGE:LSCALE:MODE AXB
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:LSCale:{P1X|P1Y|P2X|P2Y}

Function	Sets the P1:X P1:Y P2:X P2:Y values of linear scaling on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:{P1X P1Y P2X P2Y} {<Nrf>} :CHANnel<x>[:VOLTage]:LSCale:{P1X P1Y P2X P2Y}? <x>=1 to 16 <Nrf> or P1X and P2X=-9.9999E+30 to 9.9999E+30 <Nrf> of P1Y and P2Y=-9.9999E+25 to 9.9999E+25
Example	:CHANNEL1:VOLTAGE:LSCALE:P1X 10 :CHANNEL1:VOLTAGE:LSCALE:P1X? -> :CHANNEL1:VOLTAGE:LSCALE:P1X 10.0000E+00
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:LSCale:UNIT

Function	Sets the unit to be added to the result of linear scaling on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:LSCale:UNIT {<String>} :CHANnel<x>[:VOLTage]:LSCale:UNIT? <x>=1 to 16 <String>=Up to 4 characters
Example	:CHANNEL1:VOLTAGE:LSCALE:UNIT "RPM" :CHANNEL1:VOLTAGE:LSCALE:UNIT? -> :CHANNEL1:VOLTAGE:LSCALE:UNIT "RPM"
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:POSition

Function	Sets the vertical position on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:POSition {<NRf>} :CHANnel<x>[:VOLTage]:POSition? <x>=1 to 16 <NRf>=-5.00 to 5.00 (div, 0.01 div steps)
Example	:CHANNEL1:VOLTAGE:POSITION 1.00 :CHANNEL1:VOLTAGE:POSITION? -> :CHANNEL1:VOLTAGE:POSITION 1.00
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:PROBE

Function	Sets the probe type on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:PROBE {<NRf> C10 C100} :CHANnel<x>[:VOLTage]:PROBE? <x>=1 to 16 <NRf>=1, 10, 100, or 1000
Example	:CHANNEL1:VOLTAGE:PROBE 10 :CHANNEL1:VOLTAGE:PROBE? -> :CHANNEL1:VOLTAGE:PROBE 10
Description	- An error occurs if the voltage module is not installed. - This command is not available on the M701265.

:CHANnel<x>[:VOLTage]:SCALE

Function	Sets the upper and lower limits on the screen on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:SCALE {<Voltage>,<Voltage> <Current>,<Current> <NRf>,<NRf>} :CHANnel<x>[:VOLTage]:SCALE? <x>=1 to 16 <Voltage>,<Current>,<NRf>=The selectable range varies depending on the range setting. For details, see the <i>User's Manual</i> .
Example	:CHANNEL1:VOLTAGE:SCALE 20V,-20V :CHANNEL1:VOLTAGE:SCALE? -> :CHANNEL1:VOLTAGE:SCALE 20.000E+00,-20.000E+00
Description	An error occurs if the voltage module is not installed.

:CHANnel<x>[:VOLTage]:VARIABLE

Function	Sets whether to enable Variable mode on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:VARIABLE {<Boolean>} :CHANnel<x>[:VOLTage]:VARIABLE? <x>=1 to 16
Example	:CHANNEL1:VOLTAGE:VARIABLE ON :CHANNEL1:VOLTAGE:VARIABLE? -> :CHANNEL1:VOLTAGE:VARIABLE 1

:CHANnel<x>[:VOLTage]:VDIV

Function	Sets the V/div value on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:VDIV {<Voltage> <Current>} :CHANnel<x>[:VOLTage]:VDIV? When using communication commands, the range is set in terms of a value per division. For example, if you want to set a range of 50 V to channel 2, the command is :CHANnel2:VOLTage:VDIV 5V. <x>=1 to 16 <Voltage>=5 mV to 20 V (M701250/M701255 when the probe attenuation is 1:1) 1 mV to 20 V (M701251 when the probe attenuation is 1:1) 20 mV to 200 V (M701260 when the probe attenuation is 1:1) 0.1 mV to 10 V (M701265) 5 mV to 20 V (M701261/M701262)
Example	:CHANNEL1:VOLTAGE:VDIV 5V :CHANNEL1:VOLTAGE:VDIV? -> :CHANNEL1:VOLTAGE:VDIV 5.000E+00
Description	- An error occurs if the voltage module is not installed. - On the front panel, you specify the voltage corresponding to 10 divisions. However, specify the voltage corresponding to 1 division with this communication command.

:CHANnel<x>[:VOLTage]:ZOOM

Function	Sets the vertical zoom rate on the channel with the voltage module installed or queries the current setting.
Syntax	:CHANnel<x>[:VOLTage]:ZOOM {<NRf>} :CHANnel<x>[:VOLTage]:ZOOM? <x>=1 to 16 <NRf>=0.1, 0.111, 0.125, 0.143, 0.167, 0.2, 0.25, 0.33, 0.4, 0.5, 0.556, 0.625, 0.667, 0.714, 0.8, 0.833, 1, 1.11, 1.25, 1.33, 1.43, 1.67, 2, 2.22, 2.5, 3.33, 4, 5, 6.67, 8, 10, 12.5, 16.7, 20, 25, 40, 50, or 100 However, the following limitations exist on the M701260. When set to 50 V/div 0.25 to 100 When set to 100 V/div 0.5 to 100 When set to 200 V/div 1 to 100
Example	:CHANNEL1:VOLTAGE:ZOOM 10 :CHANNEL1:VOLTAGE:ZOOM? -> :CHANNEL1:VOLTAGE:ZOOM 10.000
Description	An error occurs if the voltage module is not installed.

6.6 CLEAr Group

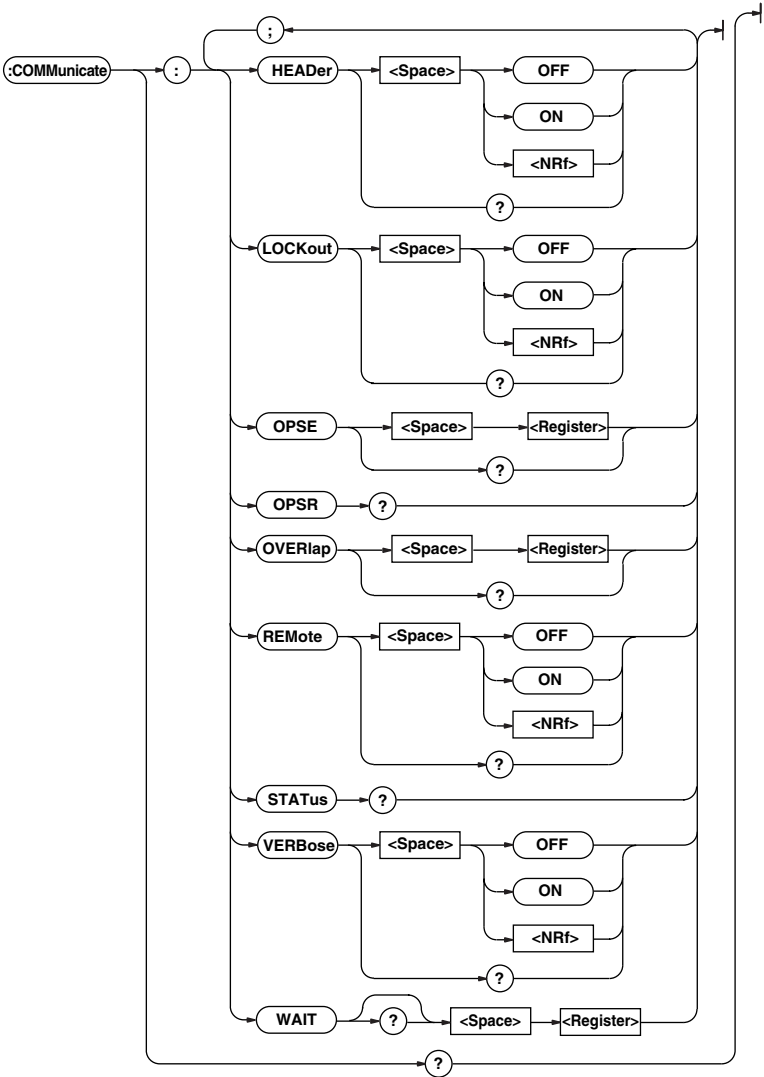
The command in this group executes clear trace. You can execute the same operation as the CLEAR TRACE key on the front panel.



:CLEAr	
Function	Executes clear trace.
Syntax	:CLEAr
Example	:CLEAR
Description	Snapshot is carried out using "SNAP."

6.7 COMMunicate Group

The commands in this group deal with communications. There are no front panel keys that correspond to the commands in this group.



:COMMunicate?

Function Queries all settings related to communications.
Syntax :COMMunicate?
Example :COMMUNICATE? ->
:COMMUNICATE:HEADER 1;
OPSE 352;OVERLAP 352;VERBOSE 1

:COMMunicate:HEADER

Function Sets whether to add a header to the response to a query (example CHANNEL1:VOLTAGE:PROBE 10) or not add the header (example 10).
Syntax :COMMunicate:HEADER {<Boolean>}
:COMMunicate:HEADER?
Example :COMMUNICATE:HEADER ON
:COMMUNICATE:HEADER? ->
:COMMUNICATE:HEADER 1

:COMMunicate:LOCKout

Function Sets or clears local lockout.
Syntax :COMMunicate:LOCKout {<Boolean>}
:COMMunicate:LOCKout?
Example :COMMUNICATE:LOCKOUT ON
:COMMUNICATE:LOCKOUT? ->
:COMMUNICATE:LOCKOUT 1
Description This command is for the serial (RS-232), USB, or Ethernet interface. For GP-IB, this function is provided as an interface message.

6.7 COMMunicate Group

:COMMunicate:OPSE (Operation Pending Status Enable register)

Function	Sets the overlap command that is used by the *OPC, *OPC?, and *WAI commands or queries the current setting.
Syntax	:COMMunicate:OPSE <Register> :COMMunicate:OPSE? <Register>=0 to 65535, :COMMunicate:WAIT? See the command diagram.
Example	:COMMUNICATE:OPSE 65535 :COMMUNICATE:OPSE? -> :COMMUNICATE:OPSE 352
Description	In the above example, all bits are set to 1 to make all overlap commands applicable. However, bits fixed to 0 are not set to 1. Thus, the response to the query indicates 1 for bits 5, 6, 8, and 11 only.

:COMMunicate:OPSR? (Operation Pending Status Register)

Function	Queries the value of the operation pending status register.
Syntax	:COMMunicate:OPSR?
Example	:COMMUNICATE:OPSR? -> 0
Description	For details on the operation pending status register, see the figure for the :COMMunicate:WAIT? command.

:COMMunicate:OVERlap

Function	Sets the commands to operate as overlap commands or queries the current setting.
Syntax	:COMMunicate:OVERlap <Register> :COMMunicate:OVERlap? <Register>=0 to 65535, :COMMunicate:WAIT? See the command diagram.
Example	:COMMUNICATE:OVERLAP 65535 :COMMUNICATE:OVERLAP? -> :COMMUNICATE:OVERLAP 352
Description	- In the above example, all bits are set to 1 to make all overlap commands applicable. However, bits fixed to 0 are not set to 1. Thus, the response to the query indicates 1 for bits 5, 6, 8, and 11 only. - For the description of how to synchronize the program using COMMunicate:OVERlap, see page 5-7. - In the above example, bits 5, 6, 8, and 11 are set to 1 to make all overlap commands applicable (see the figure for the :COMMunicate:WAIT? command).

:COMMunicate:REMOte

Function	Sets remote or local. ON is remote mode.
Syntax	:COMMunicate:REMOte {<Boolean>} :COMMunicate:REMOte?
Example	:COMMUNICATE:REMOTE ON :COMMUNICATE:REMOTE? -> :COMMUNICATE:REMOTE 1
Description	This command is for the serial (RS-232), USB, or Ethernet interface. For GP-IB, this function is provided as an interface message.

:COMMunicate:STATus?

Function	Queries line-specific status.		
Syntax	:COMMunicate:STATus?		
Example	:COMMUNICATE:STATUS? -> :COMMUNICATE:STATUS 0		
Description	The meaning of each status bit is as follows:		
Bit	GP-IB	RS-232	
0	Unrecoverable transmission error	Parity error	
1	Always 0	Framing error	
2	Always 0	Break character detected	
3 or greater	Always 0	Always 0	
For USB and Ethernet communications, 0 is always returned.			
The status bit is set when the corresponding cause occurs and cleared when it is read.			

:COMMunicate:VERBoSe

Function	Sets whether to return the response to a query using full spelling (example CHANNEL1:VOLTAGE:PROBE 10) or using abbreviation (example CHAN:PROB 10).
Syntax	:COMMunicate:VERBoSe {<Boolean>} :COMMunicate:VERBoSe?
Example	:COMMUNICATE:VERBOSE ON :COMMUNICATE:VERBOSE? -> :COMMUNICATE:VERBOSE 1

:COMMunicate:WAIT

Function	Waits for one of the specified extended events to occur.
Syntax	:COMMunicate:WAIT <Register> <Register>=0 to 65535 (extended event register, see page 7-4.)
Example	:COMMUNICATE:WAIT 65535
Description	For the description of how to synchronize the program using COMMunicate:WAIT, see page 5-8.

:COMMunicate:WAIT?

Function	Creates the response that is returned when the specified event occurs.
Syntax	:COMMunicate:WAIT? <Register> <Register>=0 to 65535 (extended event register, see page 7-4.)
Example	:COMMUNICATE:WAIT? 65535 -> 1
Description	Operation pending status register/overlap enable register

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	SCH	0	0	HST	0	ACS	PRN	0	0	0	0	0

When bit 5 (PRN) = 1:

Built-in printer operation not complete

When bit 6 (ACS) = 1:

Access to the medium not complete.

When bit 8 (HST) = 1:

History search execution not complete

When bit 11 (SCH) = 1:

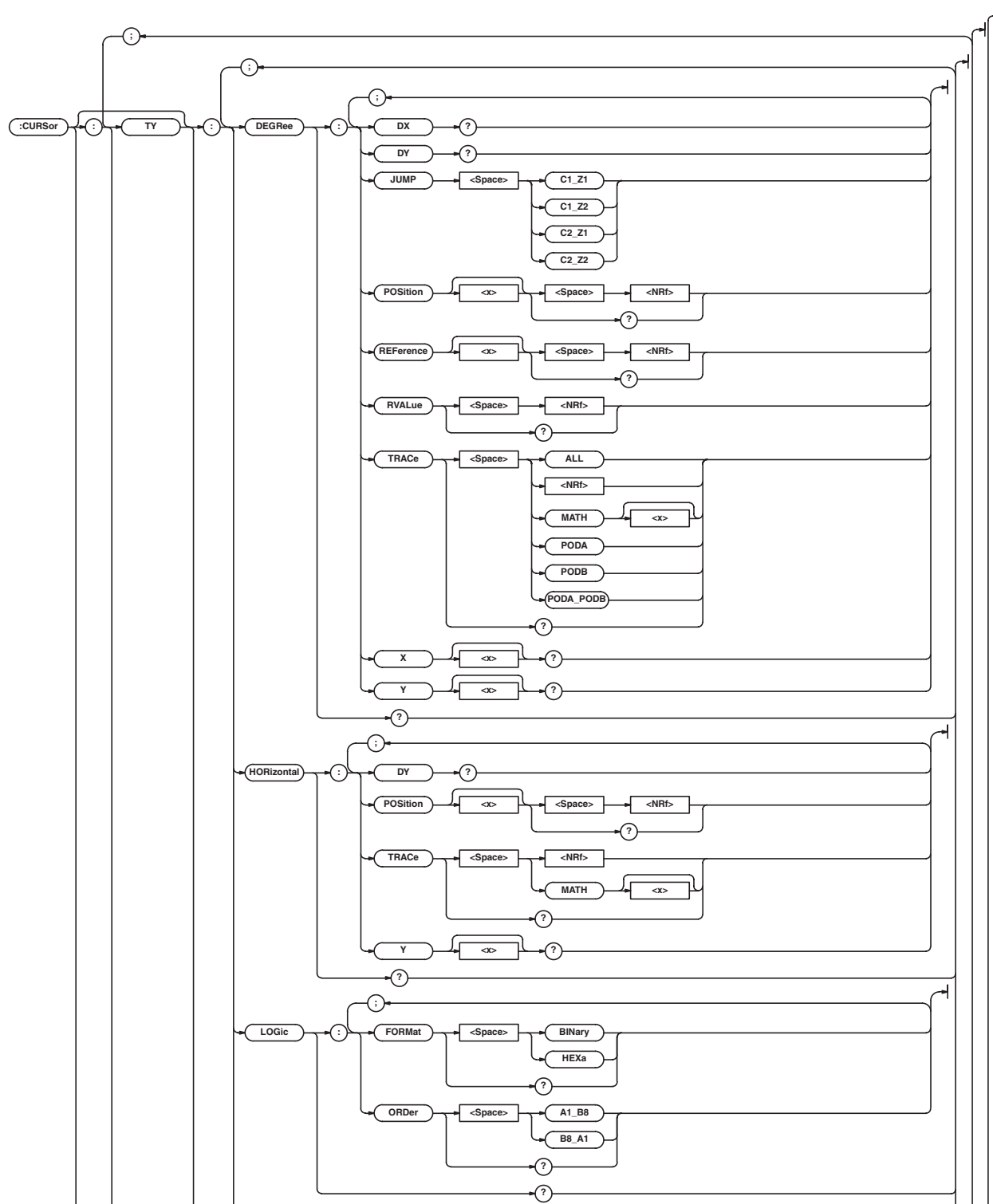
Edge/Pattern search execution not complete

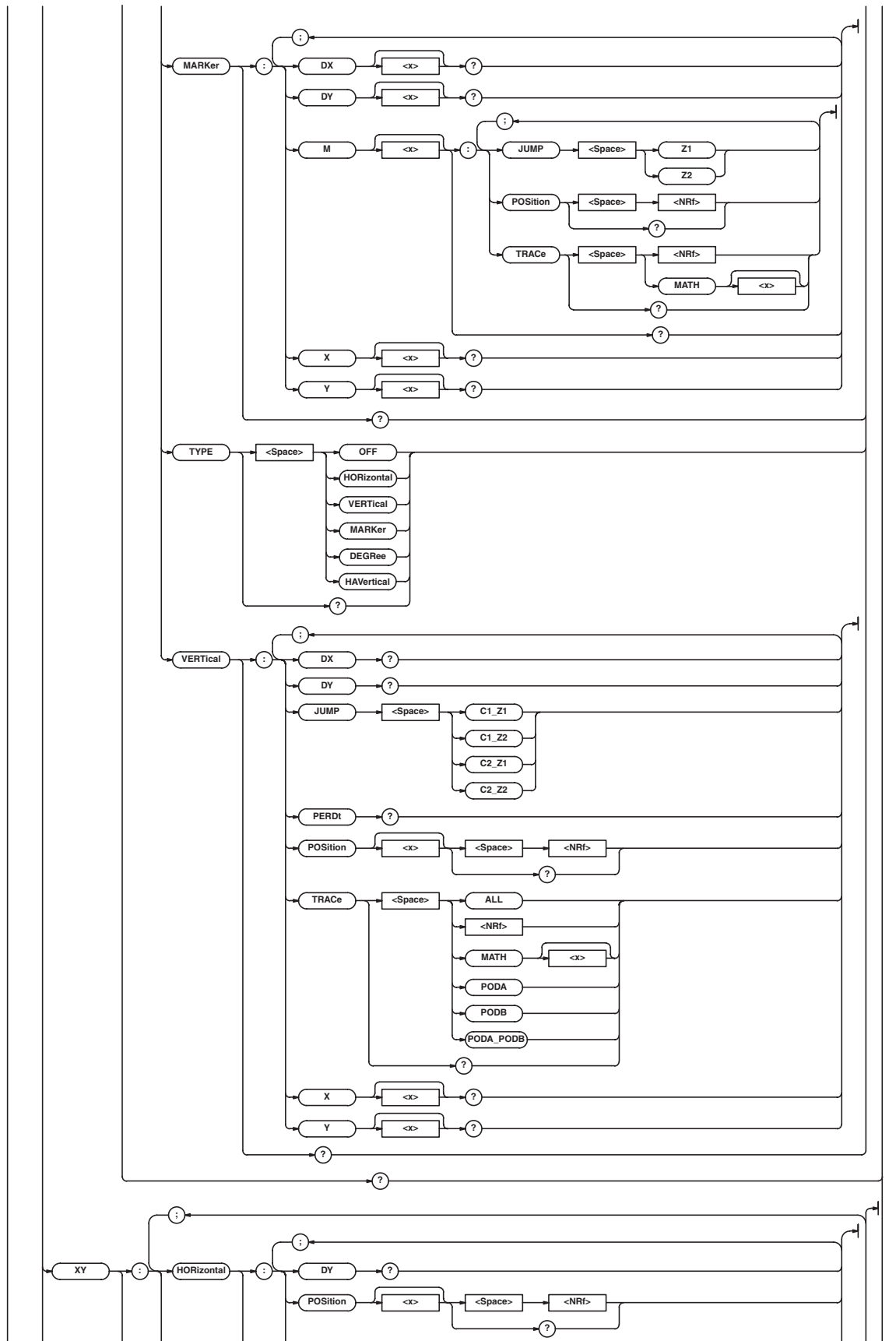
6.8 CURSor Group

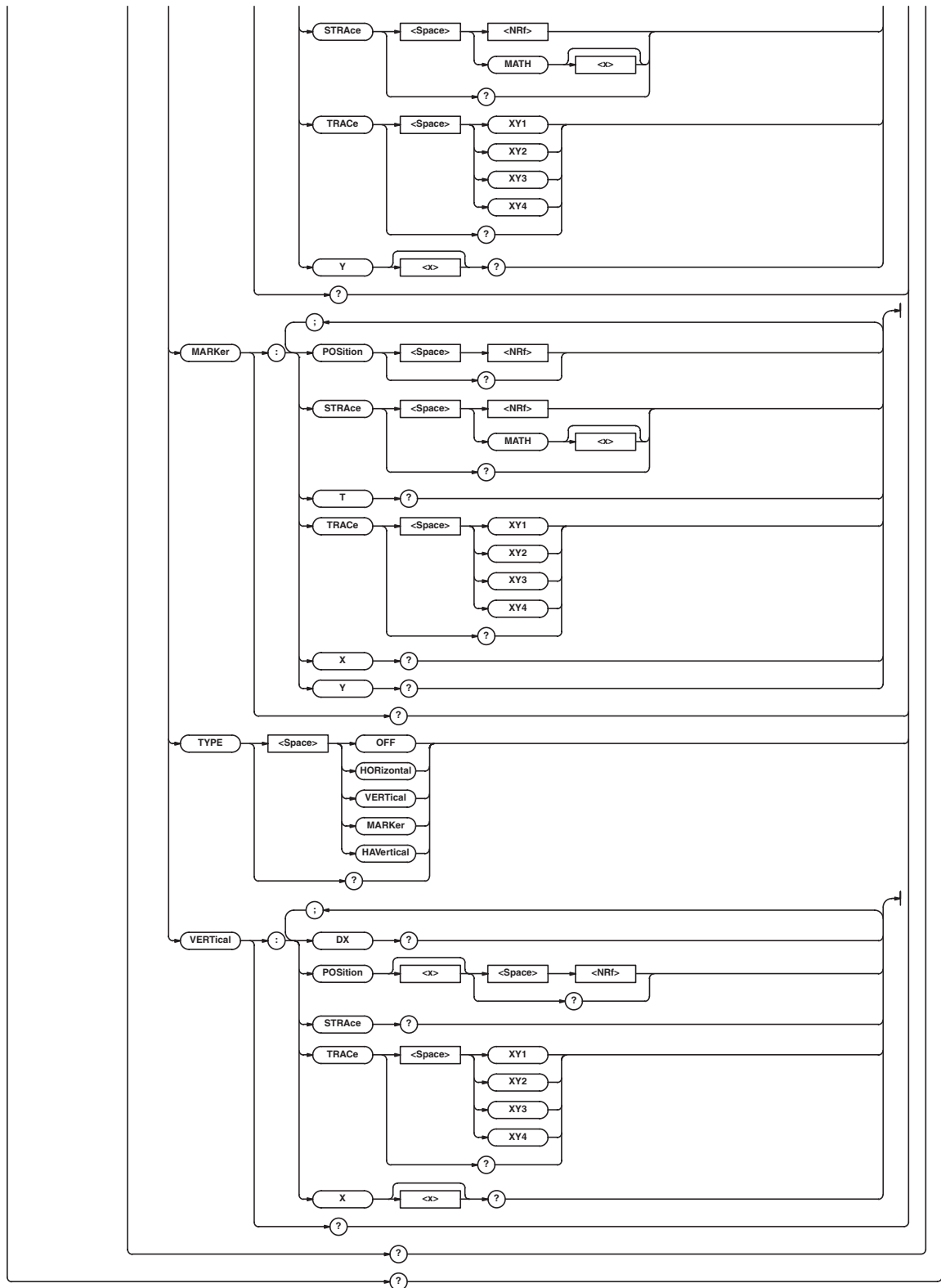
The commands in this group deal with cursor measurements. You can make the same settings and inquiries of settings and measured values as when you press the CURSOR key on the front panel.

When the time axis is set to a range indicated below, the selectable range varies depending on the record length setting. For details, see section 11.5, "Measuring Waveforms Using Cursors" in the *SL1400 User's Manual*.

<NRf>=-5 to 5 div







6.8 CURSor Group

:CURSor?

Function Queries all settings related to cursor measurements.

Syntax :CURSor?

Example :CURSor? -> :CURSOR:TY:
TYPE HORIZONTAL;HORIZONTAL:TRACE 1;
POSITION1 3.00;POSITION2 -3.00;;
CURSOR:TY:VERTICAL:TRACE 1;
POSITION1 -4.0000000;
POSITION2 4.0000000;;CURSOR:TY:
MARKER:M1:TRACE 1;
POSITION -3.0000000;;CURSOR:TY:
MARKER:M2:TRACE 2;
POSITION -1.0000000;;CURSOR:TY:
MARKER:M3:TRACE 3;
POSITION 1.0000000;;CURSOR:TY:
MARKER:M4:TRACE 4;
POSITION 3.0000000;;CURSOR:TY:
DEGREE:TRACE 1;POSITION1 -4.0000000;
POSITION2 4.0000000;
REFERENCE1 -2.0000000;
REFERENCE2 2.0000000;RVALUE 360;;
CURSOR:TY:LOGIC:FORMAT BINARY;
ORDER A1_B8;;CURSOR:XY:TYPE OFF;
HORIZONTAL:TRACE XY1;POSITION1 3.00;
POSITION2 -3.00;STRACE 1;;CURSOR:XY:
VERTICAL:TRACE XY1;POSITION1 -3.00;
POSITION2 3.00;STRACE1;;CURSOR:XY:
MARKER:TRACE XY1;
POSITION -3.0000000;STRACE 1

:CURSor[:TY] ?

Function Queries all settings related to the cursor of the T-Y display.

Syntax :CURSor:TY?

Example :CURSOR:TY? -> :CURSOR:TY:
TYPE HORIZONTAL;HORIZONTAL:TRACE 1;
POSITION1 3.00;POSITION2 -3.00;;
CURSOR:TY:VERTICAL:TRACE 1;
POSITION1 -4.0000000;
POSITION2 4.0000000;;CURSOR:TY:
MARKER:M1:TRACE 1;
POSITION -3.0000000;;CURSOR:TY:
MARKER:M2:TRACE 2;
POSITION -1.0000000;;CURSOR:TY:
MARKER:M3:TRACE 3;
POSITION 1.0000000;;CURSOR:TY:
MARKER:M4:TRACE 4;
POSITION 3.0000000;;CURSOR:TY:
DEGREE:TRACE 1;POSITION1 -4.0000000;
POSITION2 4.0000000;
REFERENCE1 -2.0000000;
REFERENCE2 2.0000000;RVALUE 360;;
CURSOR:TY:LOGIC:FORMAT BINARY;
ORDER A1_B8

:CURSor[:TY] :DEGREE?

Function Queries all settings related to the angle cursor of the T-Y display.

Syntax :CURSor:TY:DEGREE?

Example :CURSOR:TY:DEGREE? -> :CURSOR:TY:
DEGREE:TRACE 1;
POSITION1 -4.0000000;
POSITION2 4.0000000;
REFERENCE1 -2.0000000;
REFERENCE2 2.0000000;RVALUE 360

:CURSor[:TY] :DEGREE:DX?

Function Queries the angle difference ΔD between angle cursors of the T-Y display.

Syntax :CURSor:TY:DEGREE:DX?

Example :CURSOR:TY:DEGREE:DX? ->
:CURSOR:TY:DEGREE:DX 180.00000E+00

:CURSor[:TY] :DEGREE:DY?

Function Queries the ΔV value between angle cursors of the T-Y display.

Syntax :CURSor:TY:DEGREE:DY?

Example :CURSOR:TY:DEGREE:DY? ->
:CURSOR:TY:DEGREE:DY 6.2500000E-03

:CURSor[:TY] :DEGREE:JUMP

Function Jumps the angle cursor on the T-Y display onto the specified zoom waveform.

Syntax :CURSor:TY:DEGREE:JUMP
{C1_Z1|C1_Z2|C2_Z1|C2_Z2}

Example :CURSOR:TY:DEGREE:JUMP C1_Z1

Description Jumps to the center position of the zoom waveform.
C1 and C2 indicate Cursor1 and Cursor2, respectively.

:CURSor[:TY] :DEGREE:POSITION<x>

Function Sets the angle cursor position of the T-Y display or queries the current setting.

Syntax :CURSor:TY:DEGREE:POSITION<x>
{<NRf>}
:CURSor:TY:DEGREE:POSITION<x>?
<x>=1 or 2
<NRf>=-5 to 5 divisions (10 divisions/record length steps)

Example :CURSOR:TY:DEGREE:POSITION1 2
:CURSOR:TY:DEGREE:POSITION1? ->
:CURSOR:TY:DEGREE:
POSITION1 2.0000000

:CURSor[:TY] :DEGREE:REFERENCE<x>

Function Sets the position of the start point (Reference 1) or the end point (Reference 2) of the angle reference of the T-Y display or queries the current setting.

Syntax :CURSor:TY:DEGREE:REFERENCE<x>
{<NRf>}
:CURSor:TY:DEGREE:REFERENCE<x>?
<x>=1 or 2
<NRf>=-5 to 5 divisions (10 divisions/record length steps)

Example :CURSOR:TY:DEGREE:REFERENCE1 -1
:CURSOR:TY:DEGREE:REFERENCE1? ->
:CURSOR:TY:DEGREE:
REFERENCE1 -1.0000000

:CURSor[:TY] :DEGREE:RVALUE

Function Sets the reference angle of the angle cursor of the T-Y display or queries the current setting.

Syntax :CURSor:TY:DEGREE:RVALUE {<NRf>}
:CURSor:TY:DEGREE:RVALUE?
<NRf>=1 to 720

Example :CURSOR:TY:DEGREE:RVALUE 180
:CURSOR:TY:DEGREE:RVALUE? ->
:CURSOR:TY:DEGREE:RVALUE 180

:CURSor[:TY]:DEGREE:TRACE

Function Sets the target waveform of the angle cursor of the T-Y display or queries the current setting.

Syntax :CURSor:TY:DEGREE:TRACE {<NRf>|
MATH<x>|ALL|PODA|PODB|PODA_PODB}
:CURSor:TY:DEGREE:TRACE?
<NRf>=1 to 16
<x> of MATH<x>=1 to 8

Example :CURSOR:TY:DEGREE:TRACE 1
:CURSOR:TY:DEGREE:TRACE? ->
:CURSOR:TY:DEGREE:TRACE 1

:CURSor[:TY]:DEGREE:X<x>?

Function Queries the angle of the angle cursor of the T-Y display.

Syntax :CURSor:TY:DEGREE:X<x>?
<x>=1 or 2

Example (Example of the query of Cursor1.)
:CURSOR:TY:DEGREE:X1? ->
:CURSOR:TY:DEGREE:X1 -120.000000E+00

:CURSor[:TY]:DEGREE:Y<x>?

Function Queries the voltage of the angle cursor of the T-Y display.

Syntax :CURSor:TY:DEGREE:Y<x>?
<x>=1 or 2

Example (Example of the query of Cursor1.)
:CURSOR:TY:DEGREE:Y1? ->
:CURSOR:TY:DEGREE:Y1 10.000000E-03

:CURSor[:TY]:HORIZONTAL?

Function Queries all settings related to the H cursor of the T-Y display.

Syntax :CURSor:TY:HORIZONTAL?
Example :CURSOR:TY:HORIZONTAL? ->
:CURSOR:TY:HORIZONTAL:
TRACE 3;POSITION1 2.00;
POSITION2 3.00

:CURSor[:TY]:HORIZONTAL:DY?

Function Queries the Y-axis value between H cursors of the T-Y display.

Syntax :CURSor:TY:HORIZONTAL:DY?
Example :CURSOR:TY:HORIZONTAL:DY? ->
:CURSOR:TY:HORIZONTAL:
DY 3.0000000E+00

Description When linear scaling is ON, the query is for the scaled value.

:CURSor[:TY]:HORIZONTAL:POSITION<x>

Function Sets the H cursor position of the T-Y display or queries the current setting.

Syntax :CURSor:TY:HORIZONTAL:POSITION<x>
{<NRf>}
:CURSor:TY:HORIZONTAL:POSITION<x>?
<x>=1 or 2
<NRf>=5 to 5 div (1/100 steps)

Example :CURSOR:TY:HORIZONTAL:POSITION1 2
:CURSOR:TY:HORIZONTAL:POSITION1? ->
:CURSOR:TY:HORIZONTAL:
POSITION1 2.00

Description <NRf> is valid down to two digits right of the decimal point.

:CURSor[:TY]:HORIZONTAL:TRACE

Function Sets the target waveform of the H cursor of the T-Y display or queries the current setting.

Syntax :CURSor:TY:HORIZONTAL:TRACE
{<NRf>|MATH<x>}
:CURSor:TY:HORIZONTAL:TRACE?
<NRf>=1 to 16
<x> of MATH<x>=1 to 8

Example :CURSOR:TY:HORIZONTAL:TRACE 1
:CURSOR:TY:HORIZONTAL:TRACE? ->
:CURSOR:TY:HORIZONTAL:TRACE 1

:CURSor[:TY]:HORIZONTAL:Y<x>?

Function Queries the Y-axis value of the H cursor of the T-Y display.

Syntax :CURSor:TY:HORIZONTAL:Y<x>?
<x>=1 or 2

Example :CURSOR:TY:HORIZONTAL:Y1? ->
:CURSOR:TY:HORIZONTAL:
Y1 -1.5000000E+00

Description When linear scaling is ON, the query is for the scaled value.

:CURSor[:TY]:LOGic?

Function Queries all settings related to the logic display of the T-Y display.

Syntax :CURSor:TY:LOGic?
Example :CURSOR:TY:LOGIC:? ->
:CURSOR:TY:LOGIC:
FORMAT BINARY;ORDER A1_B8

:CURSor[:TY]:LOGic:FORMat

Function Sets the numerical notation of the logic display of the T-Y display.

Syntax :CURSor:TY:LOGic:FORMat
{BINary|HEXa}
:CURSor:TY:LOGic:FORMat?
Example :CURSOR:TY:LOGIC:FORMAT BINARY
:CURSOR:TY:LOGIC:FORMAT? ->
:CURSOR:TY:LOGIC:FORMAT BINARY

:CURSor[:TY]:LOGic:ORDER

Function Sets the higher/lower bit of the logic display of the T-Y display.

Syntax :CURSor:TY:LOGic:ORDER
{A1_B8|B8_A1}
:CURSor:TY:LOGic:ORDER?
Example :CURSOR:TY:LOGIC:ORDER A1_B8
:CURSOR:TY:LOGIC:ORDER? ->
:CURSOR:TY:LOGIC:ORDER A1_B8

:CURSor[:TY]:MARKer?

Function Queries all settings related to the marker cursor of the T-Y display.

Syntax :CURSor:TY:MARKer?
Example :CURSOR:TY:MARKER? -> :CURSOR:TY:
MARKER:M1:TRACE 1;
POSITION -4.0000000;;
CURSOR:TY:MARKER:M2:TRACE 2;
POSITION -1.0000000;;CURSOR:TY:
MARKER:M3:TRACE 3;
POSITION 1.0000000;;CURSOR:
TY:MARKER:M4:TRACE 4;
POSITION 3.0000000

6.8 CURSor Group

:CURSor[:TY]:MARKer:DX<x>?

Function	Queries the X-axis value between the marker cursors of the T-Y display.
Syntax	:CURSor:TY:MARKer:DX<x>? <x>=1 to 4
Example	:CURSOR:TY:MARKER:DX2? -> :CURSOR:TY:MARKER:DX2 600.00000E-03
Description	• When the time base is set to internal clock When in the time domain, the query is for the time between the markers; when in the frequency domain, the query is for the frequency between the markers. • When the time base is set to external clock The query is for the number of points between the marker cursors.

:CURSor[:TY]:MARKer:DY<x>?

Function	Queries the physical value of the Y-axis between the marker cursors of the T-Y display.
Syntax	:CURSor:TY:MARKer:DY<x>? <x>=1 to 4
Example	:CURSOR:TY:MARKER:DY2? -> :CURSOR:TY: MARKER:DY2 666.66667E-03
Description	When linear scaling is ON, the query is for the scaled value.

:CURSor[:TY]:MARKer:M<x>?

Function	Queries all settings related to the specified marker cursor.
Syntax	:CURSor:TY:MARKer:M<x>? <x>=1 to 4
Example	:CURSOR:TY:MARKER:M1? -> :CURSOR:TY:MARKER:M1: TRACE 1;POSITION -4.0000000

:CURSor[:TY]:MARKer:M<x>:JUMP

Function	Jumps the marker cursor of the T-Y display onto the specified zoom waveform.
Syntax	:CURSor:MARKer:M<x>:JUMP {Z1 Z2} <x>=1 to 4
Example	:CURSOR:TY:MARKER:M1:JUMP Z1
Description	Jumps to the center position of the zoom waveform.

:CURSor[:TY]:MARKer:M<x>:POSition

Function	Sets the X-axis value at the marker cursor position of the T-Y display or queries the current setting.
Syntax	:CURSor:TY:MARKer:M<x>:POSition {<NRf>} :CURSor:TY:MARKer:M<x>:POSition? <x> of M<x>=1 to 4 <NRf>=-5 to 5 divisions (10 divisions/record length steps)
Example	:CURSOR:TY:MARKER:M1:POSITION -1 :CURSOR:TY:MARKER:M1:POSITION? -> :CURSOR:TY:MARKER:M1: POSITION -4.0000000

:CURSor[:TY]:MARKer:M<x>:TRACE

Function	Sets the target waveform of the marker cursor of the T-Y display or queries the current setting.
Syntax	:CURSor:TY:MARKer:M<x>:TRACE {<NRf> MATH<x>} :CURSor:TY:MARKer:M<x>:TRACE? <x> of M<x>=1 to 4 <NRf>=1 to 16 <x> of MATH<x>=1 to 8
Example	:CURSOR:TY:MARKER:M1:TRACE 1 :CURSOR:TY:MARKER:M1:TRACE? -> :CURSOR:TY:MARKER:M1:TRACE 1

:CURSor[:TY]:MARKer:X<x>?

Function	Queries the X-axis value at the marker cursor position of the T-Y display.
Syntax	:CURSor:TY:MARKer:X<x>? <x>=1 to 4
Example	:CURSOR:TY:MARKER:X1? -> :CURSOR:TY:MARKER:X1 -4.5000E-03
Description	• When the time base is set to internal clock When in the time domain, the query is for the time; when in the frequency domain, the query is for the frequency. • When the time base is set to external clock When in the time domain, the query is for the number of points with respect to delay 0; when in the frequency domain, the query is for the number of points with respect to the head of the memory.

:CURSor[:TY]:MARKer:Y<x>?

Function	Queries the Y-axis value at the marker cursor position of the T-Y display.
Syntax	:CURSor:TY:MARKer:Y<x>? <x>=1 to 4
Example	:CURSOR:TY:MARKER:Y1? -> :CURSOR:TY:MARKER:Y1 1.5000E-03
Description	When linear scaling is ON, the query is for the scaled value.

:CURSor[:TY]:TYPE

Function	Sets the cursor type of the T-Y display or queries the current setting.
Syntax	:CURSor:TY:TYPE {OFF HORizontal VERTical MARKer DEGREE HAvertical} :CURSor:TY:TYPE?
Example	:CURSOR:TY:TYPE HORIZONTAL :CURSOR:TY:TYPE? -> :CURSOR:TY: TYPE HORIZONTAL

:CURSor[:TY]:VERTical?

Function	Queries all settings related to V cursor of the T-Y display.
Syntax	:CURSor:TY:VERTical?
Example	:CURSOR:TY:VERTICAL? -> :CURSOR:TY: VERTICAL:TRACE 1; POSITION1 2.0000000; POSITION2 4.0000000

:CURSor[:TY]:VERTical:DX?

Function Queries the X-axis value between the V cursors of the T-Y display.

Syntax :CURSor:TY:VERTical:DX?

Example :CURSOR:TY:VERTICAL:DX? ->
:CURSOR:TY:
VERTICAL:DX 2.0000000E-03

Description

- **When the time base is set to internal clock**
When in the time domain, the query is for the time between the markers; when in the frequency domain, the query is for the frequency between the markers.
- **When the time base is set to external clock**
The query is for the number of points between the marker cursors.

:CURSor[:TY]:VERTical:DY?

Function Queries the Y-axis value between V cursors of the T-Y display.

Syntax :CURSor:TY:VERTical:DY?

Example :CURSOR:TY:VERTICAL:DY? ->
:CURSOR:TY:VERTICAL:
DY -10.0000000E-03

Description When linear scaling of the Y trace is ON, the query is for the scaled value.

:CURSor[:TY]:VERTical:JUMP

Function Jumps the V cursor on the T-Y display onto the specified zoom waveform.

Syntax :CURSOR:TY:VERTICAL:JUMP
{C1_Z1|C1_Z2|C2_Z1|C2_Z2}

Example :CURSOR:TY:VERTICAL:JUMP C1_Z1

Description Jumps to the center position of the zoom waveform. C1 and C2 indicate V cursors Cursor1 and Cursor2, respectively.

:CURSor[:TY]:VERTical:PERDt?

Function Queries the 1/ΔT value between V cursors of the T-Y display.

Syntax :CURSor:TY:VERTical:PERDt?

Example :CURSOR:TY:VERTICAL:PERDT? ->
:CURSOR:TY:VERTICAL:
PERDT 500.000000E+00

Description When the target trace is in the frequency domain, "NAN (Not A Number)" is returned.

:CURSor[:TY]:VERTical:POSition<x>

Function Sets the V cursor position of the T-Y display or queries the current setting.

Syntax :CURSor:TY:VERTical:POSition<x>
{<Nrf>}
:CURSor:TY:VERTical:POSition<x>?
<x>=1 or 2
<Nrf>=5 to 5 divisions (10 divisions/record length steps)

Example :CURSOR:TY:VERTICAL:POSITION1 2
:CURSOR:TY:VERTICAL:POSITION1? ->
:CURSOR:TY:VERTICAL:
POSITION1 2.0000000

:CURSor[:TY]:VERTical:TRACe

Function Sets the target waveform of the V cursor of the T-Y display or queries the current setting.

Syntax :CURSor:TY:VERTical:TRACe
{<Nrf>|MATH<x>|ALL|PODA|PODB|
PODA_PODB}
:CURSor:TY:VERTical:TRACe?
<Nrf>=1 to 16

Example :CURSOR:TY:VERTICAL:TRACE 1
:CURSOR:TY:VERTICAL:TRACE? ->
:CURSOR:TY:VERTICAL:TRACE 1

:CURSor[:TY]:VERTical:X<x>?

Function Queries the X-axis value at the V cursor position of the T-Y display.

Syntax :CURSor:TY:VERTical:X<x>?
<x>=1 or 2

Example :CURSOR:TY:VERTICAL:X1? ->
:CURSOR:TY:VERTICAL:
X1 2.0000000E-03

Description

- **When the time base is set to internal clock**
When in the time domain, the query is for the time; when in the frequency domain, the query is for the frequency.
- **When the time base is set to external clock**
When in the time domain, the query is for the number of points with respect to delay 0; when in the frequency domain, the query is for the number of points with respect to the head of the memory.

:CURSor[:TY]:VERTical:Y<x>?

Function Queries the Y-axis value at the V cursor position of the T-Y display.

Syntax :CURSor:TY:VERTical:Y<x>?
<x>=1 or 2

Example :CURSOR:TY:VERTICAL:Y1? ->
:CURSOR:TY:VERTICAL:
Y1 0.0000000E+00

:CURSor:XY?

Function Queries all settings related to the cursor of the X-Y display.

Syntax :CURSor:XY?

Example :CURSOR:XY? -> :CURSOR:XY:
TYPE VERTICAL;HORIZONTAL:TRACE XY1;
POSITION1 5.00;POSITION2 -5.00;
STRACE 3;:CURSOR:XY:VERTICAL:
TRACE XY1;POSITION1 2.00;
POSITION2 5.00;STRACE 1;
:CURSOR:XY:MARKER:TRACE XY1;
POSITION -1.0000000;STRACE 2

:CURSor:XY:HORizontal?

Function Queries all settings related to the H cursor of the X-Y display.

Syntax :CURSor:XY:HORizontal?

Example :CURSOR:XY:HORIZONTAL? ->
:CURSOR:XY:HORIZONTAL:
TRACE XY1;POSITION1 5.00;
POSITION2 -5.00;STRACE 3

6.8 CURSor Group

:CURSor:XY:HORizontal:DY?

Function	Queries the Y-axis value between H cursors of the X-Y display.
Syntax	:CURSor:XY:HORizontal:DY?
Example	:CURSOR:XY:HORIZONTAL:DY? -> :CURSOR:XY:HORIZONTAL: DY 500.00000E+00
Description	When linear scaling is ON, the query is for the scaled value.

:CURSor:XY:HORizontal:POStion<x>

Function	Sets the H cursor position of the X-Y display or queries the current setting.
Syntax	:CURSor:XY:HORizontal:POStion<x> {<NRf>} :CURSor:XY:HORizontal:POStion<x>? <x>=1 or 2 <NRf>=-5 to 5 div (1/100 steps)
Example	:CURSOR:XY:HORIZONTAL:POSITION1 2 :CURSOR:XY:HORIZONTAL:POSITION1? -> :CURSOR:XY:HORIZONTAL: POSITION1 2.00

:CURSor:XY:HORizontal:STRACe

Function	Sets the target waveform of the H cursor of the X-Y display when in Single mode or queries the current setting.
Syntax	:CURSor:XY:HORizontal:STRACe {<NRf> MATH<x>} :CURSor:XY:HORizontal:STRACe? <NRf>=1 to 16 <x> of MATH<x>=1 to 8
Example	:CURSOR:XY:HORIZONTAL:STRACE 3 :CURSOR:XY:HORIZONTAL:STRACE? -> :CURSOR:XY:HORIZONTAL:STRACE 3

:CURSor:XY:HORizontal:TRACe

Function	Sets the target waveform of the H cursor of the X-Y display or queries the current setting.
Syntax	:CURSor:XY:HORizontal:TRACe {XY1 XY2 XY3 XY4} :CURSor:XY:HORizontal:TRACe?
Example	:CURSOR:XY:HORIZONTAL:TRACE XY1 :CURSOR:XY:HORIZONTAL:TRACE? -> :CURSOR:XY:HORIZONTAL:TRACE XY1

:CURSor:XY:HORizontal:Y<x>?

Function	Queries the Y-axis value of the H cursor of the X-Y display.
Syntax	:CURSor:XY:HORizontal:Y<x>? <x>=1 or 2
Example	:CURSOR:XY:HORIZONTAL:Y1? -> :CURSOR:XY:HORIZONTAL: Y1 250.00000E+00
Description	When linear scaling is ON, the query is for the scaled value.

:CURSor:XY:MARKer?

Function	Queries all settings related to the marker cursor of the X-Y display.
Syntax	:CURSor:XY:MARKer?
Example	:CURSOR:XY:MARKER? -> :CURSOR:XY: MARKER:TRACE XY1; POSITION -1.0000000;STRACE 2

:CURSor:XY:MARKer:POStion

Function	Sets the X-axis value at the marker cursor position of the X-Y display or queries the current setting.
Syntax	:CURSor:XY:MARKer:POStion {<NRf>} :CURSor:XY:MARKer:POStion? <NRf>=-5 to 5 divisions (10 divisions/record length steps)
Example	:CURSOR:XY:MARKER:POSITION -1 :CURSOR:XY:MARKER:POSITION? -> :CURSOR:XY:MARKER: POSITION -1.0000000

:CURSor:XY:MARKer:STRACe

Function	Sets the target waveform of the marker cursor of the X-Y display when in Single mode or queries the current setting.
Syntax	:CURSor:XY:MARKer:STRACe {<NRf> MATH<x>} :CURSor:XY:MARKer:STRACe? <NRf>=1 to 16 <x> of MATH<x>=1 to 8
Example	:CURSOR:XY:MARKER:STRACE 2 :CURSOR:XY:MARKER:STRACE? -> :CURSOR:XY:MARKER:STRACE 2

:CURSor:XY:MARKer:T?

Function	Queries the time value of the marker cursor of the X-Y display.
Syntax	:CURSor:XY:MARKer:T?
Example	:CURSOR:XY:MARKER:T? -> :CURSOR:XY: MARKER:T -1.0000000E-03

:CURSor:XY:MARKer:TRACe

Function	Sets the target waveform of the marker cursor of the X-Y display when the X-axis setting is Quad or queries the current setting.
Syntax	:CURSor:XY:MARKer:TRACe {XY1 XY2 XY3 XY4} :CURSor:XY:MARKer:TRACe?
Example	:CURSOR:XY:MARKER:TRACE XY1 :CURSOR:XY:MARKER:TRACE? -> :CURSOR:XY:MARKER:TRACE XY1

:CURSor:XY:MARKer:X?

Function	Queries the X-axis value at the marker cursor position of the X-Y display.
Syntax	:CURSor:XY:MARKer:X?
Example	:CURSOR:XY:MARKER:X? -> :CURSOR:XY: MARKER:X 3.6875000E+00
Description	When linear scaling is ON, the query is for the scaled value.

:CURSor:XY:MARKer:Y?

Function	Queries the Y-axis value at the marker cursor position of the X-Y display.
Syntax	:CURSor:XY:MARKer:Y?
Example	:CURSOR:XY:MARKER:Y? -> :CURSOR:XY: MARKER:Y -166.66667E-03
Description	When linear scaling is ON, the query is for the scaled value.

:CURSor:XY:TYPE

Function Sets the cursor type of the X-Y display or queries the current setting.

Syntax `:CURSor:XY:TYPE {OFF|HORIZONTAL|VERTICAL|MARKer|HAVERTICAL}`
`:CURSor:XY:TYPE?`

Example `:CURSOR:XY:TYPE VERTICAL`
`:CURSor:XY:TYPE? -> :CURSOR:XY:TYPE VERTICAL`

:CURSor:XY:VERTical?

Function Queries all settings related to the V cursor of the X-Y display.

Syntax `:CURSor:XY:VERTical?`

Example `:CURSOR:XY:VERTICAL? -> :CURSOR:XY:VERTICAL:TRACE XY1;POSITION1 2.00;POSITION2 5.00;STRACE 1`

:CURSor:XY:VERTical:DX?

Function Queries the X-axis value between the V cursors of the X-Y display.

Syntax `:CURSor:XY:VERTical:DX?`

Example `:CURSOR:XY:VERTICAL:DX? -> :CURSOR:XY:VERTICAL:DX 30.000000E+00`

Description When linear scaling of the X trace is ON, the query is for the scaled value.

:CURSor:XY:VERTical:POSition<x>

Function Sets the V cursor position of the X-Y display or queries the current setting.

Syntax `:CURSor:XY:VERTical:POSition<x> {<Nrf>}`
`:CURSor:XY:VERTical:POSition<x>? <x>=1 or 2`
`<Nrf>=-5 to 5 div (1/100 steps)`

Example `:CURSOR:XY:VERTICAL:POSITION1 2`
`:CURSOR:XY:VERTICAL:POSITION1? -> :CURSOR:XY:VERTICAL:POSITION1 2.00`

:CURSor:XY:VERTical:STRACE?

Function Queries the target waveform of the V cursor of the X-Y display when the X-axis setting is Single.

Syntax `:CURSor:XY:VERTical:STRACE?`

Example `:CURSOR:XY:VERTICAL:STRACE? -> :CURSOR:XY:VERTICAL:STRACE 2`

:CURSor:XY:VERTical:TRACe

Function Sets the target waveform of the V cursor of the X-Y display when the X-axis setting is Quad or queries the current setting.

Syntax `:CURSor:XY:VERTical:TRACe {XY1|XY2|XY3|XY4}`
`:CURSor:XY:VERTical:TRACe?`

Example `:CURSOR:XY:VERTICAL:TRACE XY1`
`:CURSOR:XY:VERTICAL:TRACE? -> :CURSOR:XY:VERTICAL:TRACE XY1`

:CURSor:XY:VERTical:X<x>?

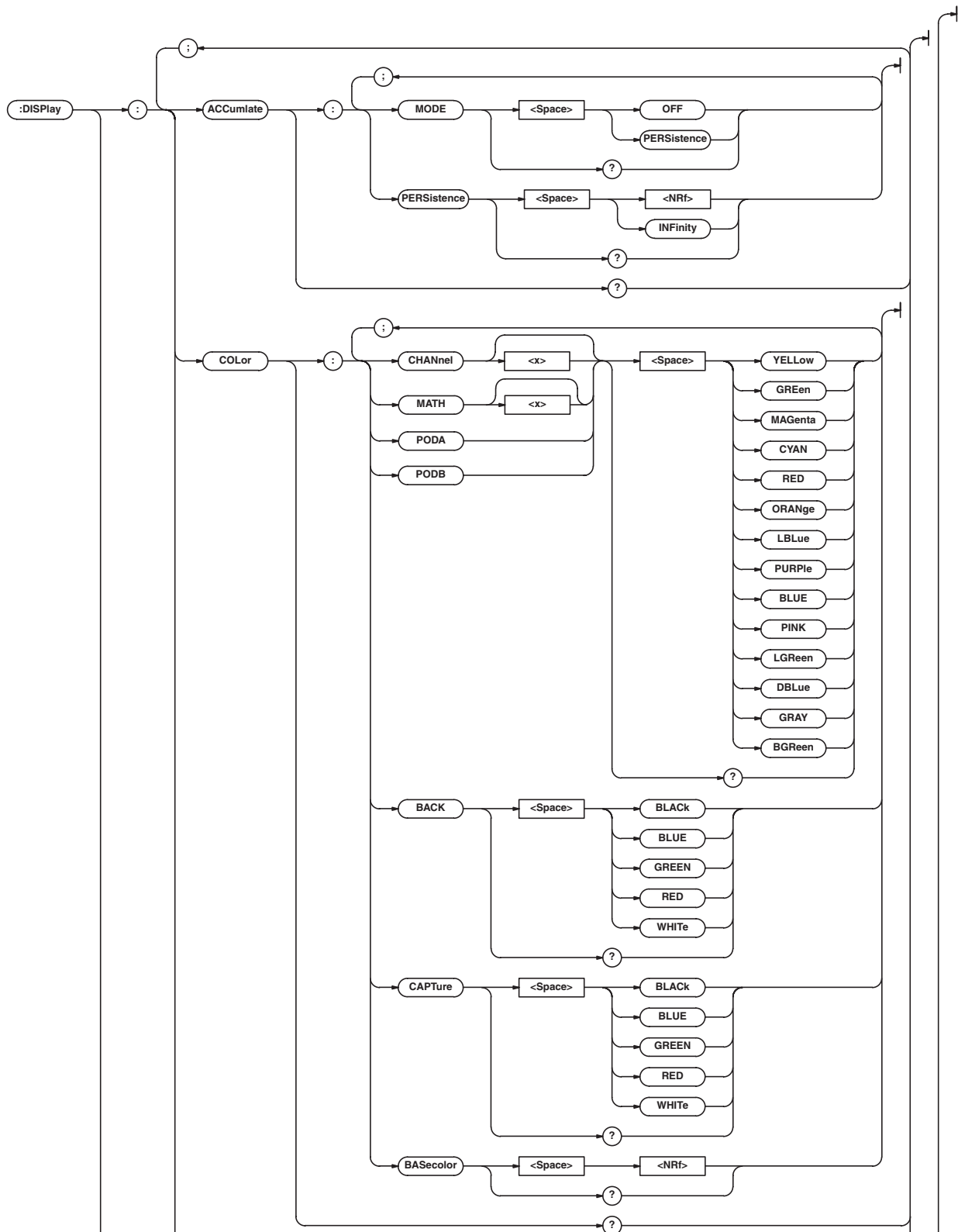
Function Queries the X-axis value at the V cursor position of the X-Y display.

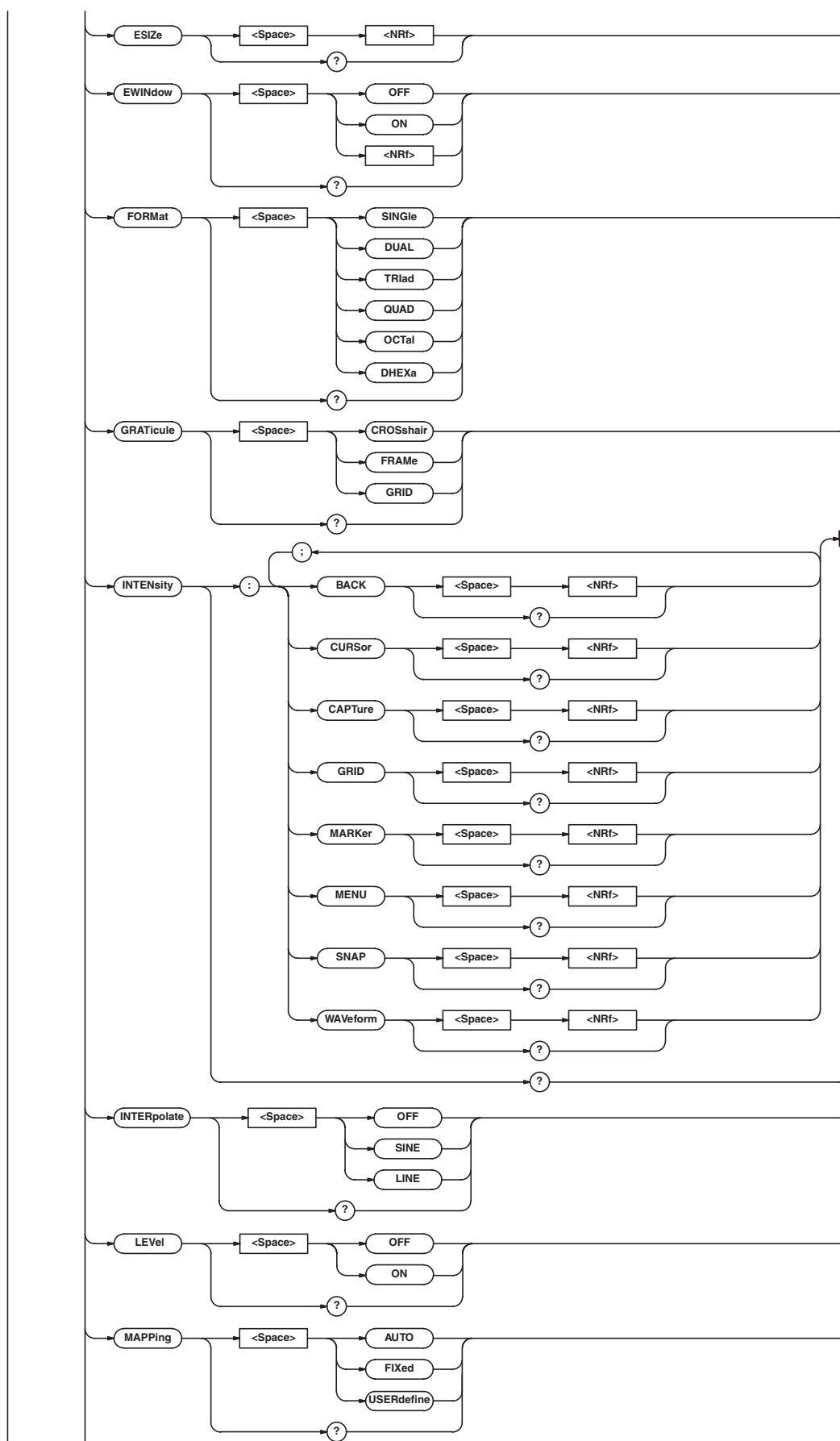
Syntax `:CURSor:XY:VERTical:X<x>? <x>=1 or 2`

Example `:CURSOR:XY:VERTICAL:X1? -> :CURSOR:XY:VERTICAL:X1 20.000000E+00`

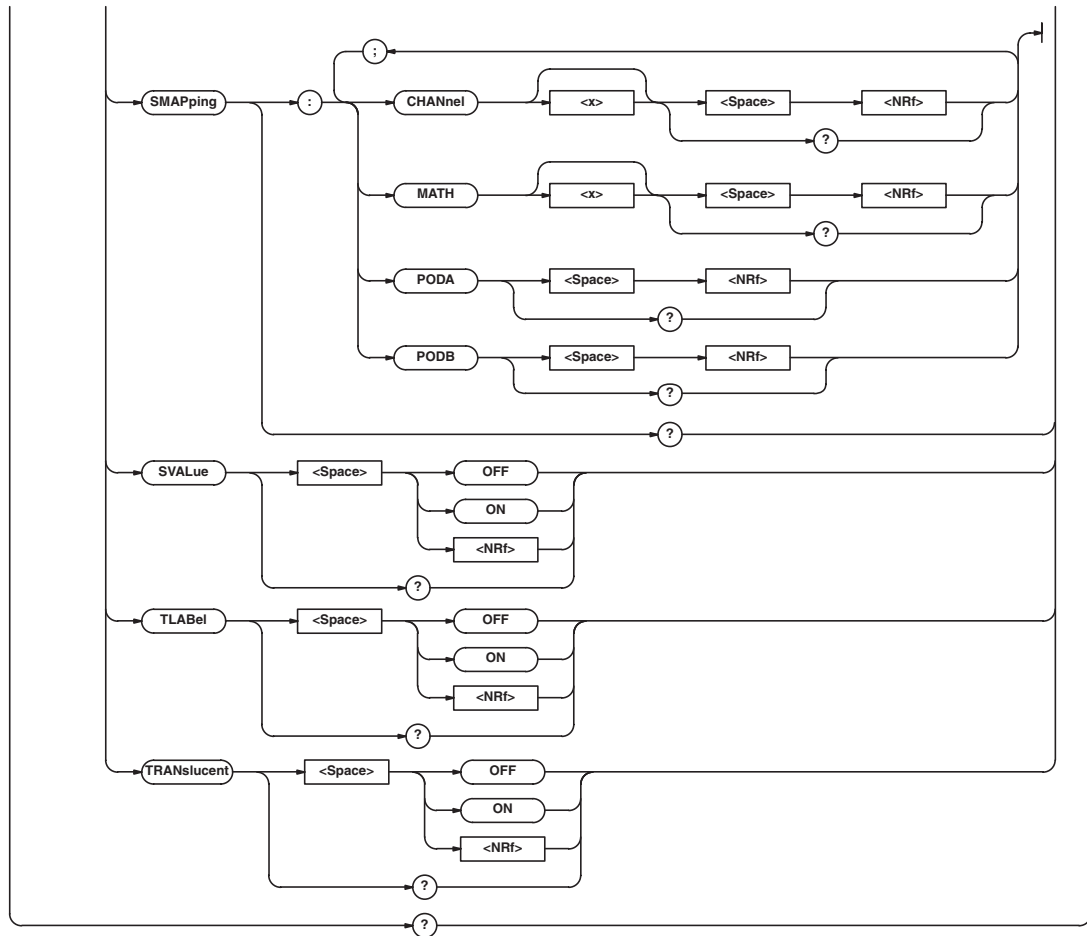
6.9 DISPlay Group

The commands in this group deal with the screen display. You can make the same settings and inquiries as when the front panel keys such as the DISPLAY key and the MENU key > Next 1/2 soft key > Others soft key are used.





6.9 DISPlay Group



:DISPlay?

Function Queries all settings related to the display.

Syntax :DISPlay?

Example :DISPlay? -> :DISPLAY:FORMAT QUAD;
INTERPOLATE LINE;DECIMATION 2000;
GRATICULE GRID;ACCUMULATE:MODE OFF;
PERSISTENCE 16;:DISPLAY:EWINDOW 0;
SVALUE 1;TLABEL 0;TRANSLUCENT 0;
MAPPING USERDEFINE;SMAPPING:
CHANNEL1 0;CHANNEL2 1;CHANNEL3 2;
CHANNEL4 3;CHANNEL5 4;CHANNEL6 5;
CHANNEL7 6;CHANNEL8 7;CHANNEL9 0;
CHANNEL10 1;CHANNEL11 2;CHANNEL12 3;
MATH1 6;MATH2 7;MATH3 0;MATH4 1;
MATH5 2;MATH6 3;MATH7 4;MATH8 5;
PODA 6;PODB 7;EVENT 0;
:DISPLAY:COLOR:CHANNEL1 YELLOW;
CHANNEL2 GREEN;CHANNEL3 MAGENTA;
CHANNEL4 CYAN;CHANNEL5 RED;
CHANNEL6 ORANGE;CHANNEL7 LBLUE;
CHANNEL8 PURPLE;CHANNEL9 PINK;
CHANNEL10 LGREEN;CHANNEL11 DBLUE;
CHANNEL12 YELLOW;MATH1 YELLOW;
MATH2 GREEN;MATH3 MAGENTA;
MATH4 CYAN;MATH5 RED;MATH6 ORANGE;
MATH7 LBLUE;MATH8 PURPLE;PODA PINK;
EVENT DBLUE;PODB LGREEN;BACK BLACK;
CAPTURE BLACK;BASECOLOR 1;:DISPLAY:
INTENSITY:WAVEFORM 12;MENU 12;
BACK 3;CAPTURE 3;SNAP 12;GRID 12;
CURSOR 12;MARKER 12

:DISPlay:ACCumulate?

Function Queries all settings related to the waveform accumulation display.

Syntax :DISPlay:ACCumulate?

Example :DISPlay:ACCUMULATE? -> :DISPLAY:
ACCUMULATE:MODE PERSISTENCE;
PERSISTENCE 16

:DISPlay:ACCumulate:MODE

Function Sets the waveform accumulation display mode or queries the current setting.

Syntax :DISPlay:ACCumulate:MODE
{OFF|PERSISTENCE}
:DISPlay:ACCumulate:MODE?

Example :DISPlay:ACCUMULATE:MODE
PERSISTENCE
:DISPlay:ACCUMULATE:MODE? ->
:DISPlay:ACCUMULATE:
MODE PERSISTENCE

:DISPlay:ACCumulate:PERSistence

Function Sets the number of accumulated waveforms or queries the current setting.

Syntax :DISPlay:ACCumulate:PERSistence
{<NRf>|INFINITY}
:DISPlay:ACCumulate:PERSistence?
<NRf>=2 to 128 (2ⁿ steps)

Example :DISPlay:ACCUMULATE:PERSISTENCE 16
:DISPlay:ACCUMULATE:PERSISTENCE? ->
:DISPlay:ACCUMULATE:PERSISTENCE 16

:DISPlay:COLor?

Function Queries all settings related to the display color.
 Syntax :DISPlay:COLor?
 Example :DISPLAY:COLOR? -> :DISPLAY:COLOR:
 CHANNEL1 YELLOW;CHANNEL2 GREEN;
 CHANNEL3 MAGENTA;CHANNEL4 CYAN;
 CHANNEL5 RED;CHANNEL6 ORANGE;
 CHANNEL7 LBLUE;CHANNEL8 PURPLE;
 CHANNEL9 PINK;CHANNEL10 LGREEN;
 CHANNEL11 DBLUE;CHANNEL12 YELLOW;
 MATH1 YELLOW;MATH2 GREEN;
 MATH3 MAGENTA;MATH4 CYAN;
 MATH5 RED;MATH6 ORANGE;
 MATH7 LBLUE;MATH8 PURPLE;PODA PINK;
 PODB LGREEN;BACK BLACK;
 CAPTURE BLACK;BASECOLOR 1

:DISPlay:COLor:{CHANnel<x>|MATH<x>|PodA|PodB}

Function Sets the color of the waveform or queries the current setting.
 Syntax :DISPlay:COLor:{CHANnel<x>|MATH<x>|PodA|PodB}
 {YELLow|GREen|MAGenta|CYAN|RED|ORANge|LBLue|PURple|BLUE|PINK|LGRen|DBLue|GRAY|BGRen}
 :DISPlay:COLor:COLor:{CHANnel<x>|MATH<x>|PodA|PodB}?
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8
 Example :DISPLAY:COLOR:CHANNEL1 MAGENTA
 :DISPLAY:COLOR:CHANNEL1? ->
 :DISPLAY:COLOR:CHANNEL1 MAGENTA

:DISPlay:COLor:{BACK|CAPTure}

Function Sets the color of the background or the sub waveform window or queries the current setting.
 Syntax :DISPlay:COLor:{BACK|CAPTure}
 {BLACK|BLUE|RED|GREen|WHITE}
 :DISPlay:COLor:{BACK|CAPTure}?
 Example :DISPLAY:COLOR:BACK WHITE
 :DISPLAY:COLOR:BACK? ->
 :DISPLAY:COLOR:BACK WHITE

:DISPlay:COLor:BASEcolor

Function Sets the basic color of the menu or queries the current setting.
 Syntax :DISPlay:COLor:BASEcolor {<NRf>}
 :DISPlay:COLor:BASEcolor?
 <NRf>=1 to 3
 Example :DISPLAY:COLOR:BASECOLOR 2
 :DISPLAY:COLOR:BASECOLOR? ->
 :DISPLAY:COLOR:BASECOLOR 2

:DISPlay:ESize

Function Sets the extra window size or queries the current setting.
 Syntax :DISPlay:ESize {<NRf>}
 :DISPlay:ESize?
 <NRf>=0 to 8
 Example :DISPLAY:ESIZE 8 :DISPLAY:ESIZE? ->
 :DISPLAY:ESIZE 8

:DISPlay:EWINDow

Function Turns ON/OFF the extra window or queries the current setting.
 Syntax :DISPlay:EWINDow {<Boolean>}
 :DISPlay:EWINDow?
 Example :DISPLAY:EWINDOW OFF
 :DISPLAY:EWINDOW? ->
 :DISPLAY:EWINDOW 0

:DISPlay:FORMat

Function Sets the display format or queries the current setting.
 Syntax :DISPlay:FORMat
 {SINGle|DUAL|TRIad|QUAD|OCTal|DHEXa}
 :DISPlay:FORMat?
 Example :DISPLAY:FORMAT QUAD
 :DISPLAY:FORMAT? -> :DISPLAY:
 FORMAT QUAD
 Description SINGLE, DUAL, TRIad, QUAD, OCTal, and DHEXa correspond to 1 ZONE, 2 ZONE, 3 ZONE, 4 ZONE, 8 ZONE, and 16 ZONE, respectively.

:DISPlay:GRATicule

Function Sets the grid (graticule) or queries the current setting.
 Syntax :DISPlay:GRATicule
 {CROSShair|FRAME|GRID}
 :DISPlay:GRATicule?
 Example :DISPLAY:GRATICULE GRID
 :DISPLAY:GRATICULE? -> :DISPLAY:
 GRATICULE GRID

:DISPlay:INTENSity?

Function Queries all settings related to the brightness of the displayed items.
 Syntax :DISPlay:INTENSity?
 Example :DISPLAY:INTENSITY? -> :DISPLAY:
 INTENSITY:WAVEFORM 12;MENU 12;
 BACK 3;CAPTURE 3;SNAP 12;
 GRID 12;CURSOR 12;MARKER 12

:DISPlay:INTENSity:{CURSor|MENU|GRID|SNAP|WAVEform|MARKer|CAPTure|BACK}

Function Sets the brightness of the display item or queries the current setting.
 Syntax :DISPlay:INTENSity:{CURSor|MENU|GRID|SNAP|WAVEform|MARKer|CAPTure|BACK} {<NRf>}
 :DISPlay:INTENSity:{CURSor|MENU|GRID|SNAP|WAVEform|MARKer|CAPTure|BACK}?
 <NRf>=1 to 15
 Example :DISPLAY:INTENSITY:CURSOR 6
 :DISPLAY:INTENSITY:CURSOR? ->
 :DISPLAY:INTENSITY:CURSOR 6

6.9 DISPlay Group

:DISPlay:INTERpolate

Function Sets the interpolation method or queries the current setting.

Syntax `:DISPlay:INTERpolate {LINE|OFF|SINE}`
`:DISPlay:INTERpolate?`

Example `:DISPLAY:INTERPOLATE LINE`
`:DISPLAY:INTERPOLATE? -> :DISPLAY:INTERPOLATE LINE`

:DISPlay:LEVel

Function Sets the level indicator display or queries the current setting.

Syntax `:DISPlay:LEVel {<Boolean>}`
`:DISPlay:LEVel?`

Example `:DISPLAY:LEVEL ON`
`:DISPLAY:LEVEL? -> :DISPLAY:LEVEL 1`

:DISPlay:MAPPing

Function Sets the mode of the waveform mapping to the split screen or queries the current setting.

Syntax `:DISPlay:MAPPing {AUTO|FIXed|USERdefine}`
`:DISPlay:MAPPing?`

Example `:DISPLAY:MAPPING AUTO`
`:DISPLAY:MAPPING? -> :DISPLAY:MAPPING AUTO`

:DISPlay:SMAPPing?

Function Queries all settings related to the waveform mapping to the split screen.

Syntax `:DISPlay:SMAPPing?`

Example `:DISPLAY:SMAPPING? -> :DISPLAY:SMAPPING:CHANNEL1 0;CHANNEL2 1;CHANNEL3 2;CHANNEL4 3;CHANNEL5 4;CHANNEL6 5;CHANNEL7 6;CHANNEL8 7;CHANNEL9 0;CHANNEL10 1;CHANNEL11 2;CHANNEL12 3;MATH1 6;MATH2 7;MATH3 0;MATH4 1;MATH5 2;MATH6 3;MATH7 4;MATH8 5;PODA 6;PODB 7;`

:DISPlay:SMAPPing:{CHANnel<x>|MATH<x>|PODA|PODB}

Function Sets the waveform mapping to the split screen or queries the current setting.

Syntax `:DISPlay:SMAPPing:{CHANnel<x>|MATH<x>|PODA|PODB} {<Nrf>}`
`:DISPlay:SMAPPing:{CHANnel<x>|MATH<x>|PODA|PODB}?`
`<x> of CHANnel<x>=1 to 16`
`<x> of MATH<x>=1 to 8`
`<Nrf>=0 to 15`

Example `:DISPLAY:SMAPPING:CHANNEL1 0`
`:DISPLAY:SMAPPING:CHANNEL1? ->`
`:DISPLAY:SMAPPING:CHANNEL1 3`

Description This setting is valid only when `:MATH:MAPPING` is set to `USERdefine`.

:DISPlay:SVALue (Scale VALUE)

Function Turns ON/OFF the scale value display or queries the current setting.

Syntax `:DISPlay:SVALue {<Boolean>}`
`:DISPlay:SVALue?`

Example `:DISPLAY:SVALUE OFF`
`:DISPLAY:SVALUE? -> :DISPLAY:SVALUE 0`

:DISPlay:TLabel (Trace LABEL)

Function Turns ON/OFF the waveform label display or queries the current setting.

Syntax `:DISPlay:TLabel {<Boolean>}`
`:DISPlay:TLabel?`

Example `:DISPLAY:TLABEL ON`
`:DISPLAY:TLABEL? -> :DISPLAY:TLABEL 1`

Description You can set the user definition of the waveform label using `:CHANnel<x>:LAbel.-`

:DISPlay:TRANslucent

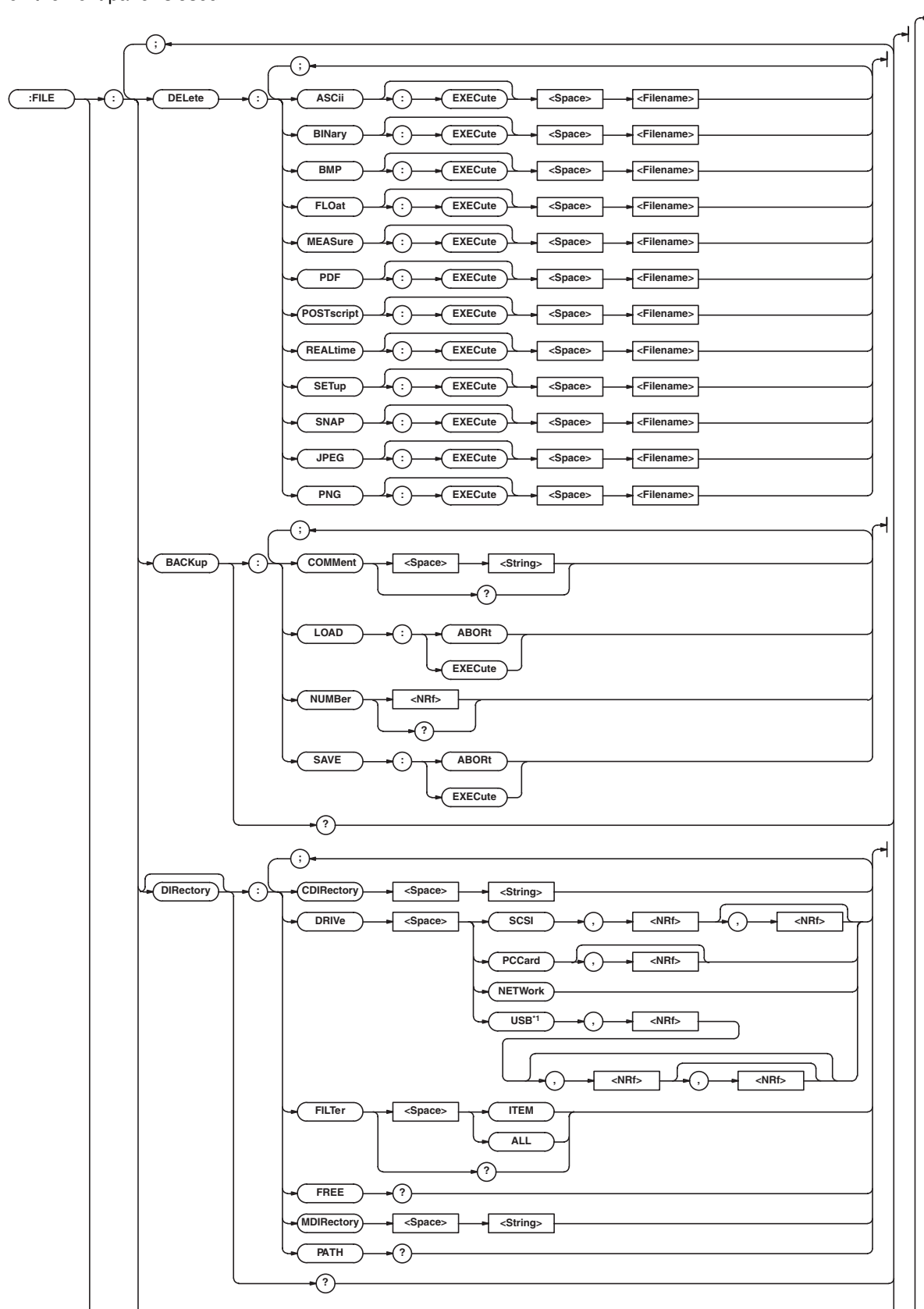
Function Turns ON/OFF the translucent mode of the pop-up menu or queries the current setting.

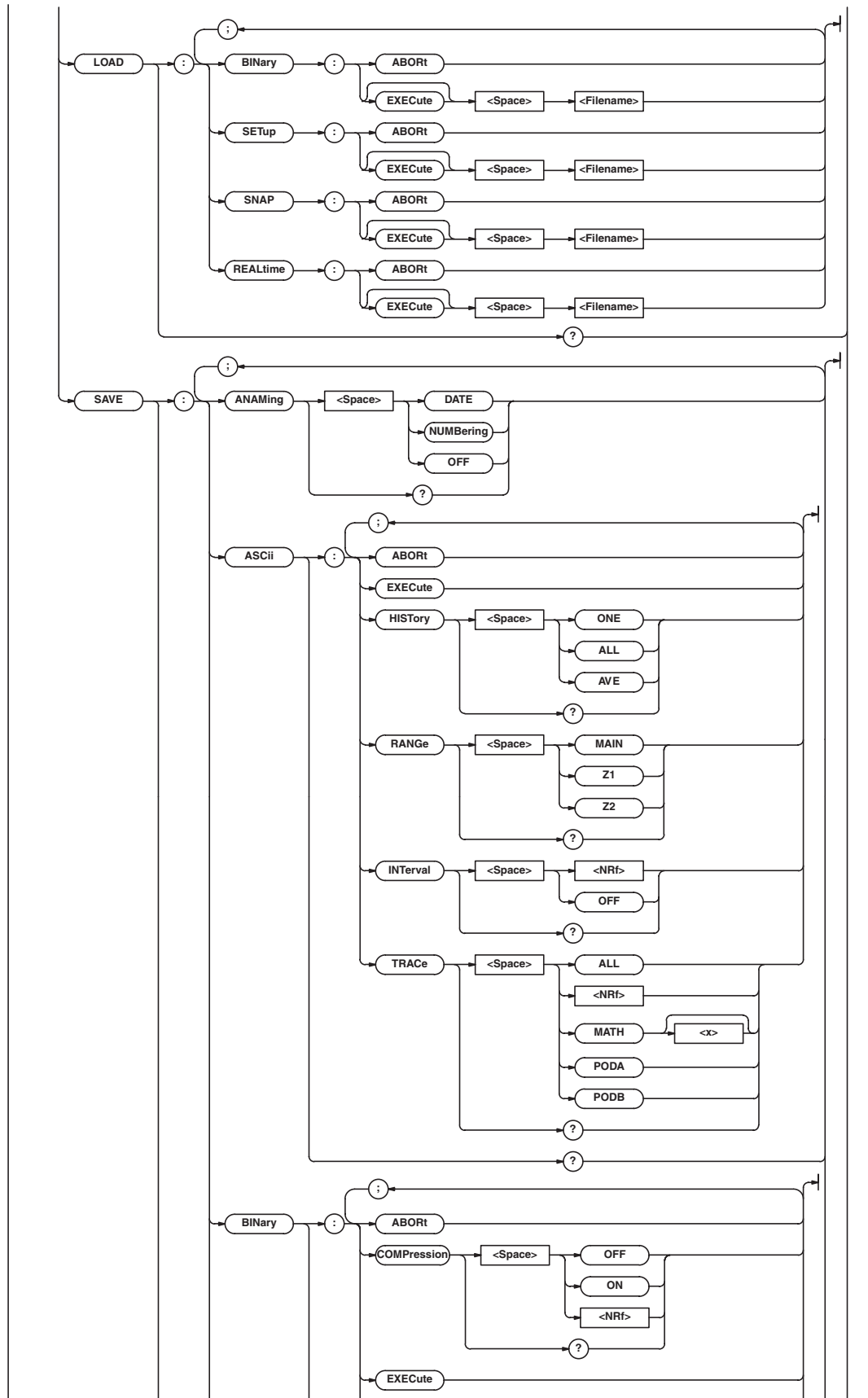
Syntax `:DISPlay:TRANslucent {<Boolean>}`
`:DISPlay:TRANslucent?`

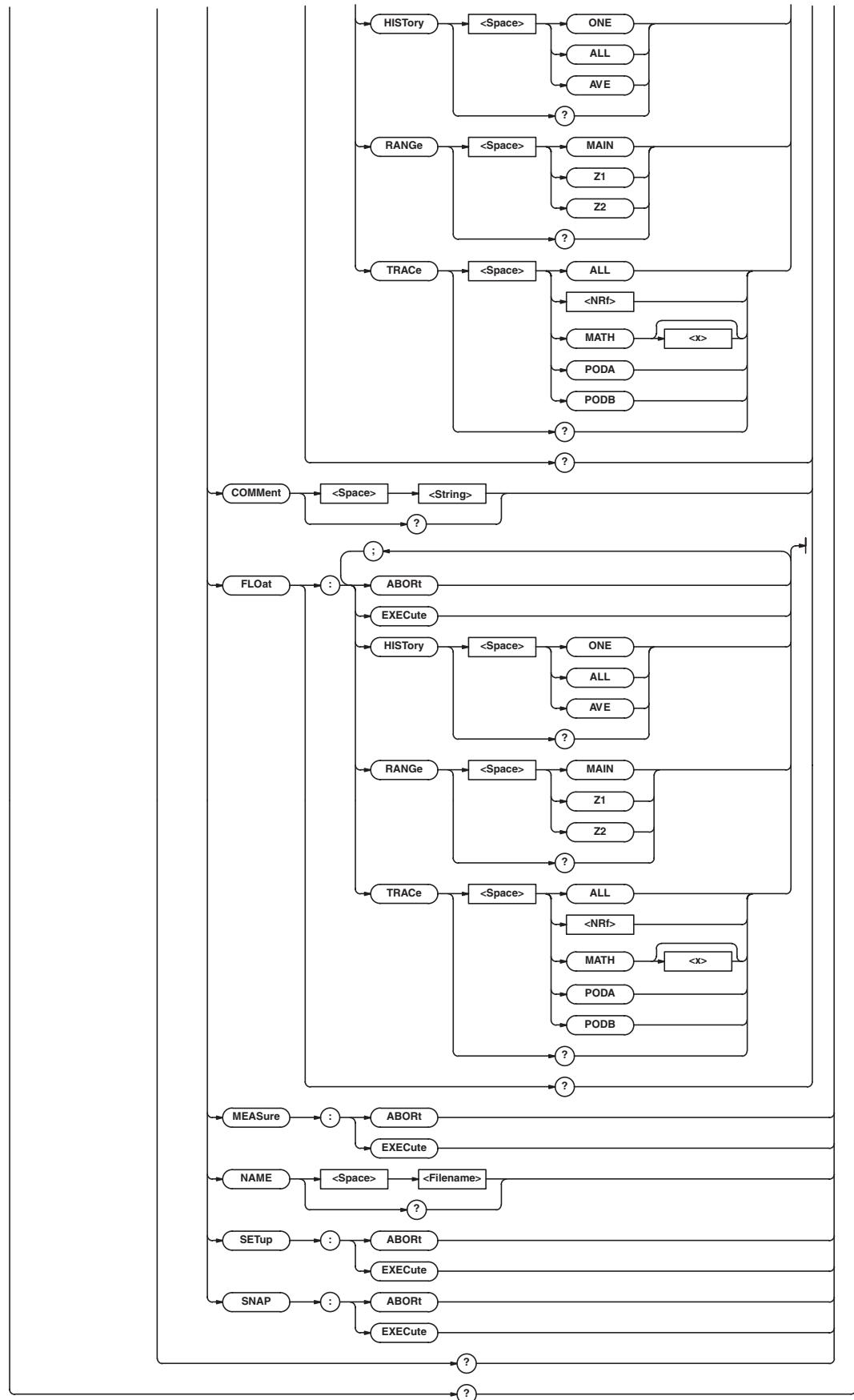
Example `:DISPLAY:TRANSLUCENT ON`
`:DISPLAY:TRANSLUCENT? -> :DISPLAY:TRANSLUCENT 1`

6.10 FILE Group

The commands in this group deal with the floppy disk, the internal hard disk, and the external SCSI device. You can make the same settings, execute the same operations, and make the same inquiries as when the FILE key on the front panel is used.







1 USB can be specified only on models supporting USB storage devices (see section 13.3 in the *SL1400 User's Manual*).

6.10 FILE Group

:FILE?

Function Queries all settings related to the storage medium.

Syntax :FILE?

Example :FILE? -> :FILE:DIRECTORY:
 FILTER ITEM;:FILE:SAVE:BINARy:
 TRACE ALL;RANGE MAIN;HISTORY ONE;
 COMPRESSION 0;:FILE:SAVE:ASCIi:
 TRACE ALL;RANGE MAIN;HISTORY ONE;
 INTERVAL OFF;:FILE:SAVE:FLOAT:
 TRACE ALL;RANGE MAIN;HISTORY ONE;;
 FILE:SAVE:ANAMING NUMBERING;
 NAME "" ;COMMENT "" ;:FILE:FORMAT:
 TYPE HD14;PARTITION 1

:FILE:BACKUp?

Function Queries all settings related to the saving and loading setup data on the SL1400.

Syntax :FILE:BACKUp?

Example :FILE:BACKUP?
 :FILE:BACKUP:NUMBER 1;COMMENT
 "YOKOGAWA"

:FILE:BACKUp:NUMBER

Function Sets the number of the SL1400 memory to save or load the setup data or queries the current setting.

Syntax :FILE:BACKUp:NUMBER {<NRf>}
 :FILE:BACKUp:NUMBER?
 <NRf> = 1~3

Example :FILE:BACKUP:NUMBER 1
 :FILE:BACKUP:NUMBER? ->
 :FILE:BACKUP:NUMBER 1

:FILE:BACKUp:COMMeNt

Function Sets the comment for the setup data to be saved or queries the current setting.

Syntax :FILE:BACKUp:COMMeNt {<String>}
 :FILE:BACKUp:COMMeNt?
 {<String>} = Up to 160 characters

Example :FILE:BACKUP:COMMENT "YOKOGAWA"
 :FILE:BACKUP:COMMENT? ->
 :FILE:BACKUP:COMMENT "YOKOGAWA"

:FILE:BACKUp:SAVE[:EXECute]

Function Executes the saving of the setup data to the SL1400. This is an overlap command.

Syntax :FILE:BACKUp:SAVE[:EXECute]

Example :FILE:BACKUP:SAVE:EXECUTE

:FILE:BACKUp:SAVE:ABORt

Function Aborts the saving of the setup data to the SL1400.

Syntax :FILE:BACKUp:SAVE:ABORt

Example :FILE:BACKUP:SAVE:ABORT

:FILE:BACKUp:LOAD[:EXECute]

Function Executes the loading of the setup data saved to the SL1400.
 This is an overlap command.

Syntax :FILE:BACKUp:LOAD[:EXECute]

Example :FILE:BACKUP:LOAD:EXECUTE

:FILE:BACKUp:LOAD:ABORt

Function Aborts the loading of the setup data saved to the SL1400.

Syntax :FILE:BACKUp:LOAD:ABORt

Example :FILE:BACKUP:LOAD:ABORT

:FILE:DELeTe:{ASCIi|BINARy|BMP|FLOat|MEASure|PDF|POSTscript|REALtime|SETUp|SNAP|JPEG|PNG}[:EXECute]

Function Executes the deletion of the data file. This is an overlap command.

Syntax :FILE:DELeTe:{ASCIi|BINARy|BMP|FLOat|MEASure|PDF|POSTscript|REALtime|SETUp|SNAP|JPEG|PNG}[:EXECute]
 <Filename>

Example (The following is an example for the setup data.)
 :FILE:DELETE:SETUP "CASE1"

Description

- The target medium to be deleted is selected using :FILE[:DIRectory]:DRIVE.
- This command cannot be executed on data on the REALTIME partition (SCSI address = internal ID, partition = 0).

:FILE:DIRectory?

Function Queries all settings related to the directory of the storage medium.

Syntax :FILE:DIRectory?

Example :FILE:DIRECTORY? ->
 :FILE:DIRECTORY:FILTER ITEM

:FILE[:DIRectory]:CDIREctory (Change Directory)

Function Changes the current directory of the storage medium.

Syntax :FILE[:DIRectory]:CDIREctory
 <String>

Example :FILE:DIRECTORY:CDIRECTORY "NO_1"

:FILE[:DIRectory]:DRIVE

Function Sets the storage medium to be controlled.

Syntax :FILE[:DIRectory]:DRIVE { (SCSI,
 <NRf>[, <NRf>]) | PCCard[, <NRf>] |
 NETWORK | USB, <NRf>[, <NRf>] [, <NRf>] }
 The first <NRf> of SCSI=SCSI address (0 to 7)
 The second <NRf> of SCSI=Partitions (0 to 2)
 <NRf> of PCCard=Partitions (0 to 1)
 The first <NRf> of USB = USB address
 The second <NRf> of USB = Partition (0 to 3) or LUN (logical unit number: 0 to 3)
 The third <NRf> of USB = Partition (0 to 3) when LUN is specified in the second <NRf>
 USB can be specified only on models supporting USB storage devices (see section 13.3 in the *SL 1400 User's Manual*)

Example :FILE:DIRECTORY:DRIVE SCSI, 4, 1

Description

- If the drive does not contain partitions (SCSI or PCCard), omit the <NRf> corresponding to the partitions. "NETWork" can be used when the Ethernet interface (option) is installed.
- The second or third <NRf> when USB is selected can be omitted if the drive is not partitioned or divided by LUN.

:FILE[:DIReCTory]:FILTer

Function Sets a filter on the target directory or queries the current setting.

Syntax **:FILE[:DIReCTory]:FILTer {ITEM|ALL}**
:FILE[:DIReCTory]:FILTer?

Example **:FILE:DIRECTORY:FILTER ITEM**
:FILE:DIRECTORY:FILTER? -> :FILE:DIRECTORY:FILTER ITEM

:FILE[:DIReCTory]:FREE?

Function Queries the free disk space (bytes) on the target storage medium.

Syntax **:FILE[:DIReCTory]:FREE?**

Example **:FILE:DIRECTORY:FREE? -> :FILE:DIRECTORY:FREE 3.7567939E+09**

:FILE[:DIReCTory]:MDIRectory (Make Directory)

Function Creates a new directory in the current directory. This is an overlap command.

Syntax **:FILE[:DIReCTory]:MDIRectory <String>**

Example **:FILE:DIRECTORY:MDIRECTORY "NO_1"**

:FILE[:DIReCTory]:PATH?

Function Queries the current directory.

Syntax **:FILE[:DIReCTory]:PATH?**

Example **:FILE:DIRECTORY:PATH? -> :FILE:DIRECTORY:PATH "Path = HD-0"**

:FILE:LOAD:{BINary|REALtime|SETup|SNAP}:ABORt

Function Aborts the loading of the data.

Syntax **:FILE:LOAD:{BINary|REALtime|SETup|SNAP}:ABORt**

Example (The following is an example for the setup data.)
:FILE:LOAD:SETUP:ABORT

:FILE:LOAD:{BINary|REALtime|SETup|SNAP}[:EXECute]

Function Executes the loading of the data. This is an overlap command.

Syntax **:FILE:LOAD:{BINary|REALtime|SETup|SNAP}[:EXECute] <Filename>**

Example (The following is an example for the setup data.)
:FILE:LOAD:SETUP:EXECUTE "CASE1"

Description

- The target medium to be loaded is selected using **:FILE[:DIReCTory]:DRIVE**.
- This command cannot be executed on data on the REALTIME partition (SCSI address = internal ID, partition = 0).

:FILE:SAVE?

Function Queries all settings related to the saving of files.

Syntax **:FILE:SAVE?**

Example **:FILE:SAVE? -> :FILE:SAVE:BINARY:TRACE ALL;RANGE MAIN;HISTORY ONE;COMPRESSION 0;;FILE:SAVE:ASCII:TRACE ALL;RANGE MAIN;HISTORY ONE;INTERVAL OFF;;FILE:SAVE:FLOAT:TRACE ALL;RANGE MAIN;HISTORY ONE;;FILE:SAVE:ANAMING OFF;NAME "TTL";COMMENT ""**

:FILE:SAVE:ANAMing

Function Sets the auto naming function of the saved files or queries the current setting.

Syntax **:FILE:SAVE:ANAMing {DATE|NUMBERing|OFF}**
:FILE:SAVE:ANAMing?

Example **:FILE:SAVE:ANAMING DATE**
:FILE:SAVE:ANAMING? -> :FILE:SAVE:ANAMING DATE

:FILE:SAVE:{ASCii|BINary|FLOat}?

Function Queries all settings related to the saving of the data.

Syntax **:FILE:SAVE:{ASCii|BINary|FLOat}?**

Example **:FILE:SAVE:BINARY? -> :FILE:SAVE:BINARY:TRACE ALL;RANGE MAIN;HISTORY ONE;COMPRESSION 0**

:FILE:SAVE:{ASCii|BINary|FLOat|MEASure|SETup|SNAP}:ABORt

Function Aborts the saving of the data.

Syntax **:FILE:SAVE:{ASCii|BINary|FLOat|MEASure|SETup|SNAP}:ABORt**

Example (The following is an example for the waveform data.)
:FILE:SAVE:BINARY:ABORT

:FILE:SAVE:{ASCii|BINary|FLOat|MEASure|SETup|SNAP}[:EXECute]

Function Executes the saving of the data to a file. This is an overlap command.

Syntax **:FILE:SAVE:{ASCii|BINary|FLOat|MEASure|SETup|SNAP}[:EXECute]**

Example (The following is an example for the waveform data.)
:FILE:SAVE:BINARY:EXECUTE

:FILE:SAVE:{ASCii|BINary|FLOat}:HISTORY

Function Sets the save target of the history memory of the data or queries the current setting.

Syntax **:FILE:SAVE:{ASCii|BINary|FLOat}:HISTORY {ONE|ALL|AVE}**
:FILE:SAVE:{ASCii|BINary|FLOat}:HISTORY?

Example **:FILE:SAVE:BINARY:HISTORY ALL**
:FILE:SAVE:BINARY:HISTORY? -> :FILE:SAVE:BINARY:HISTORY ALL

:FILE:SAVE:{ASCii|BINary|FLOat}:RANGe

Function Sets the range of data to be saved or queries the current setting.

Syntax **:FILE:SAVE:{ASCii|BINary|FLOat}:RANGe {MAIN|Z1|Z2}**
:FILE:SAVE:{ASCii|BINary|FLOat}:RANGe?

Example **:FILE:SAVE:BINARY:RANGE Z1**
:FILE:SAVE:BINARY:RANGE? -> :FILE:SAVE:BINARY:RANGE Z1

6.10 FILE Group

:FILE:SAVE:{ASCIi|BINary|FLOat}

:TRACe

Function	Sets the waveform to be saved or queries the current setting.
Syntax	<pre>:FILE:SAVE:{ASCIi BINary FLOat}: TRACE{ALL <Nrf> MATH[<x>] PODA PODB} :FILE:SAVE:{ASCIi BINary FLOat}: TRACe? <Nrf>=1 to 16 <x> of MATH<x>=1 to 8</pre>
Example	<pre>:FILE:SAVE:ASCIi:TRACE 1 :FILE:SAVE:ASCIi:TRACE? -> :FILE:SAVE:ASCIi:TRACE 1</pre>

:FILE:SAVE:ASCIi:INTERval

Function	Sets the decimation interval for saving data or queries the current setting.
Syntax	<pre>:FILE:SAVE:ASCIi:INTERval {<Nrf> OFF} :FILE:SAVE:ASCIi:INTERval? <Nrf>=5, 10, 20, 50, 100, 200, 500, 1000, 2000, or 5000</pre>
Example	<pre>:FILE:SAVE:ASCIi:INTERVAL 2000 :FILE:SAVE:ASCIi:INTERVAL? -> :FILE:SAVE:ASCIi:INTERVAL 2000</pre>

:FILE:SAVE:BINary:COMPReSSion

Function	Sets the data compression of the waveform to be saved or queries the current setting.
Syntax	<pre>:FILE:SAVE:BINary:COMPReSSion {<Boolean>} :FILE:SAVE:BINary:COMPReSSion?</pre>
Example	<pre>:FILE:SAVE:BINary:COMPRESSION ON :FILE:SAVE:BINary:COMPRESSION? -> :FILE:SAVE:BINary:COMPRESSION 1</pre>
Description	• The range to be saved is Main screen only. • Only binary data can be compressed.

:FILE:SAVE:COMMeNt

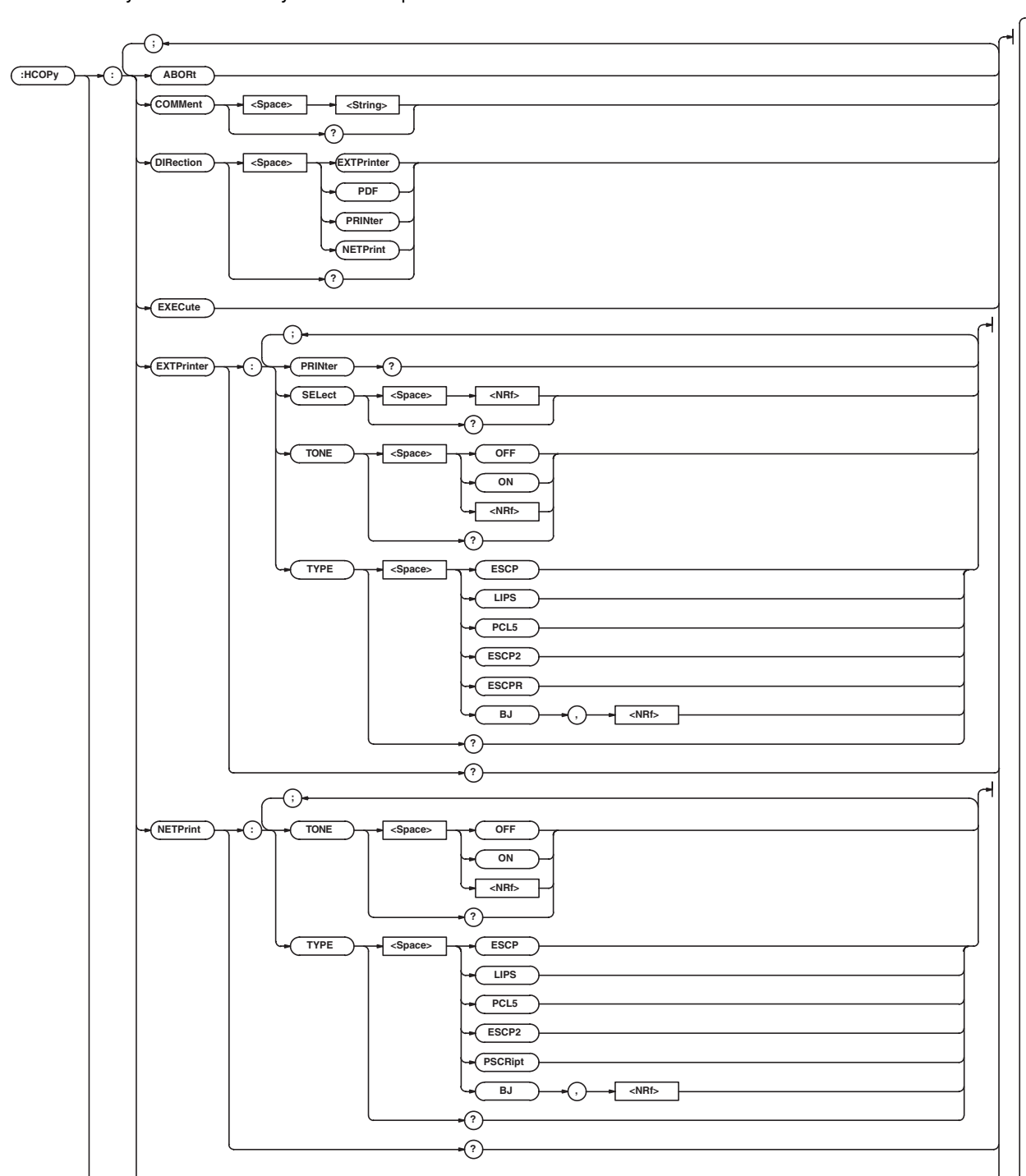
Function	Sets the comment of data to be saved or queries the current setting.
Syntax	<pre>:FILE:SAVE:COMMeNt <String> :FILE:SAVE:COMMeNt? <String>=Up to 25 characters</pre>
Example	<pre>:FILE:SAVE: COMMENT "THIS IS TEST." :FILE:SAVE: COMMENT? -> :FILE:SAVE: COMMENT "THIS IS TEST."</pre>
Description	Only the characters and symbols displayed on the keyboard on the screen can be used. In ASCII code Ω and μ are expressed as 1EH and 1FH, respectively."

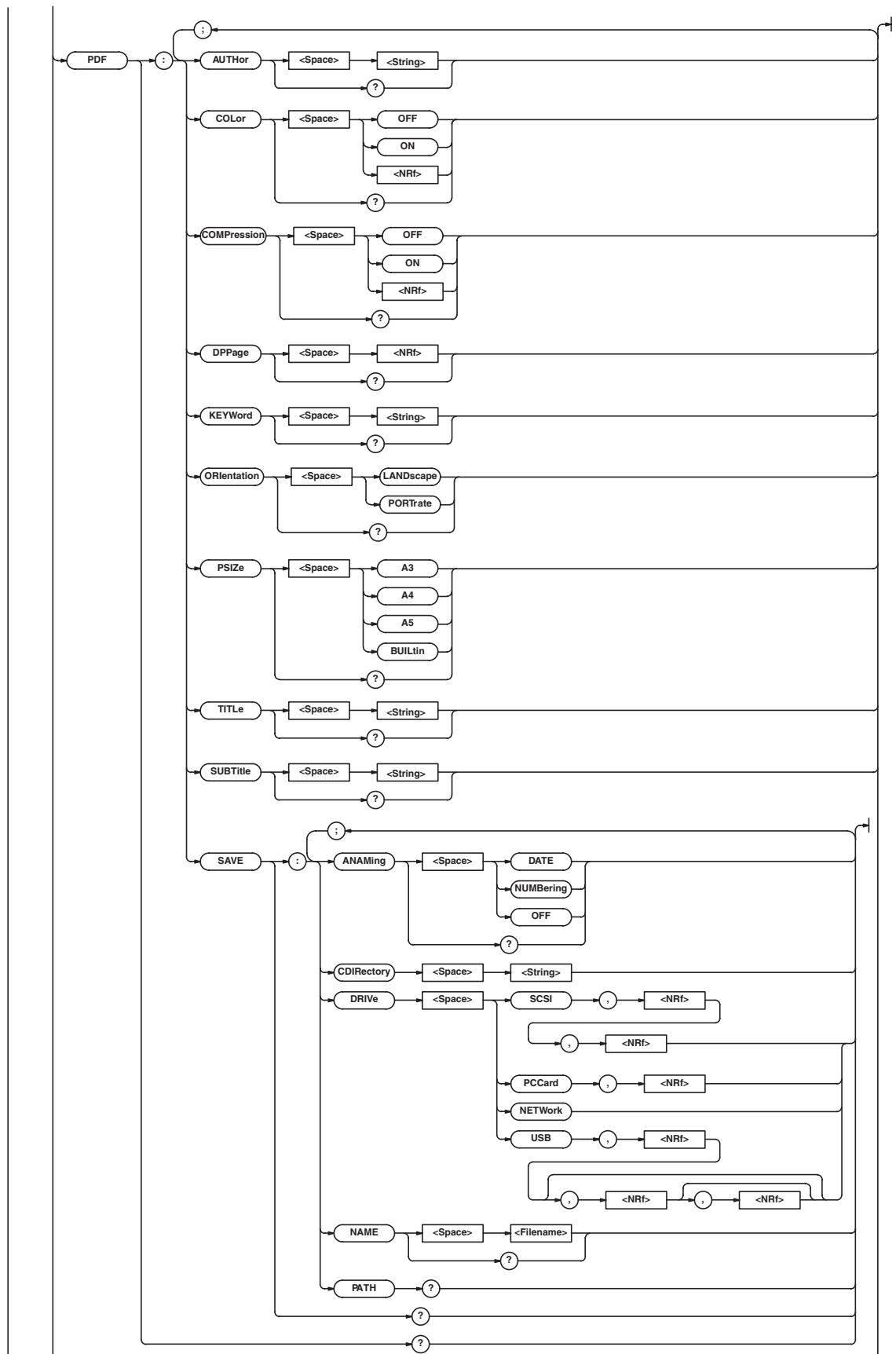
:FILE:SAVE:NAME

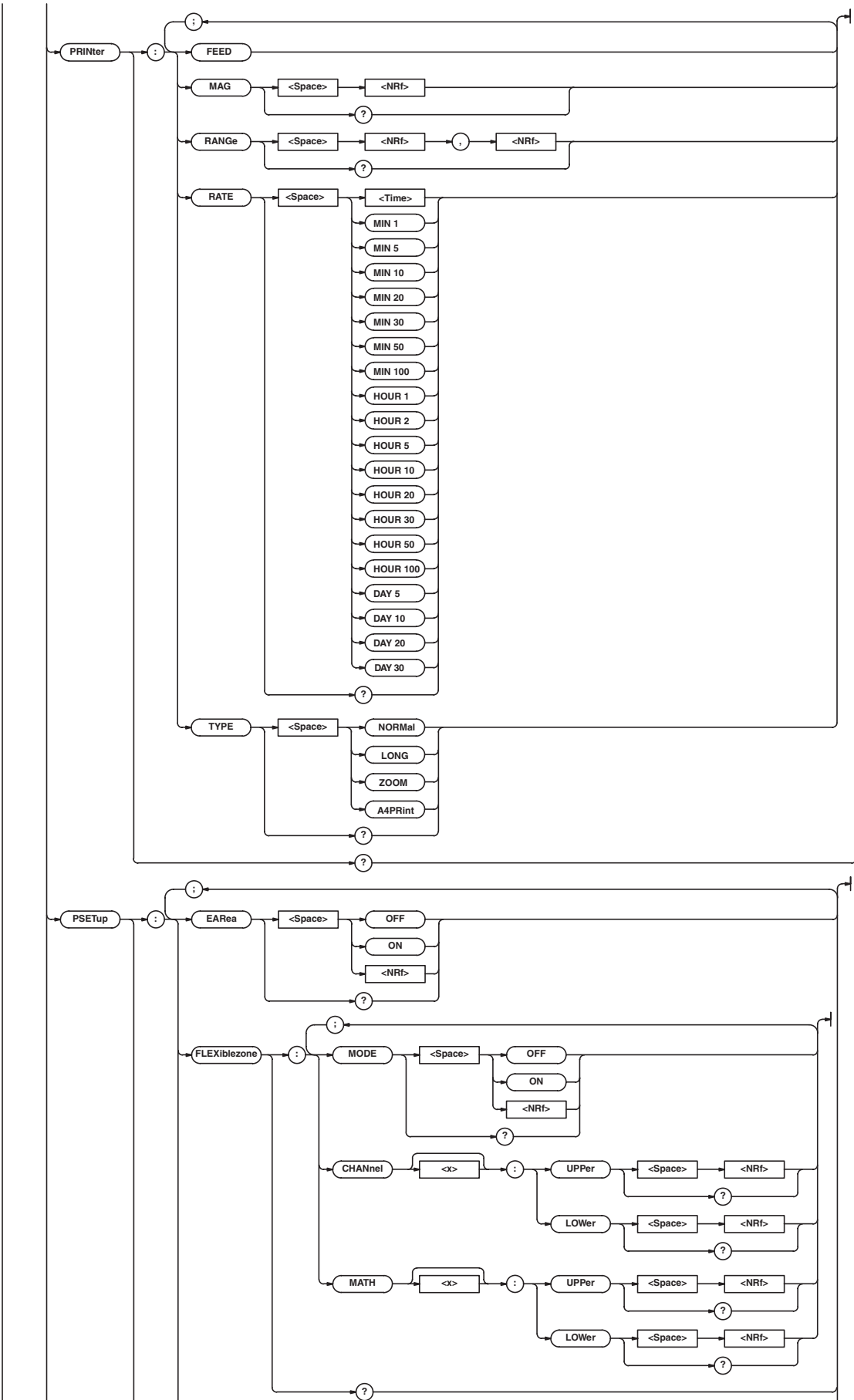
Function	Sets the name of the file to be saved or queries the current setting.
Syntax	<pre>:FILE:SAVE:NAME <Filename> :FILE:SAVE:NAME?</pre>
Example	<pre>:FILE:SAVE:NAME "CASE1" :FILE:SAVE:NAME? -> :FILE:SAVE: NAME "CASE1"</pre>

6.11 HCOpy Group

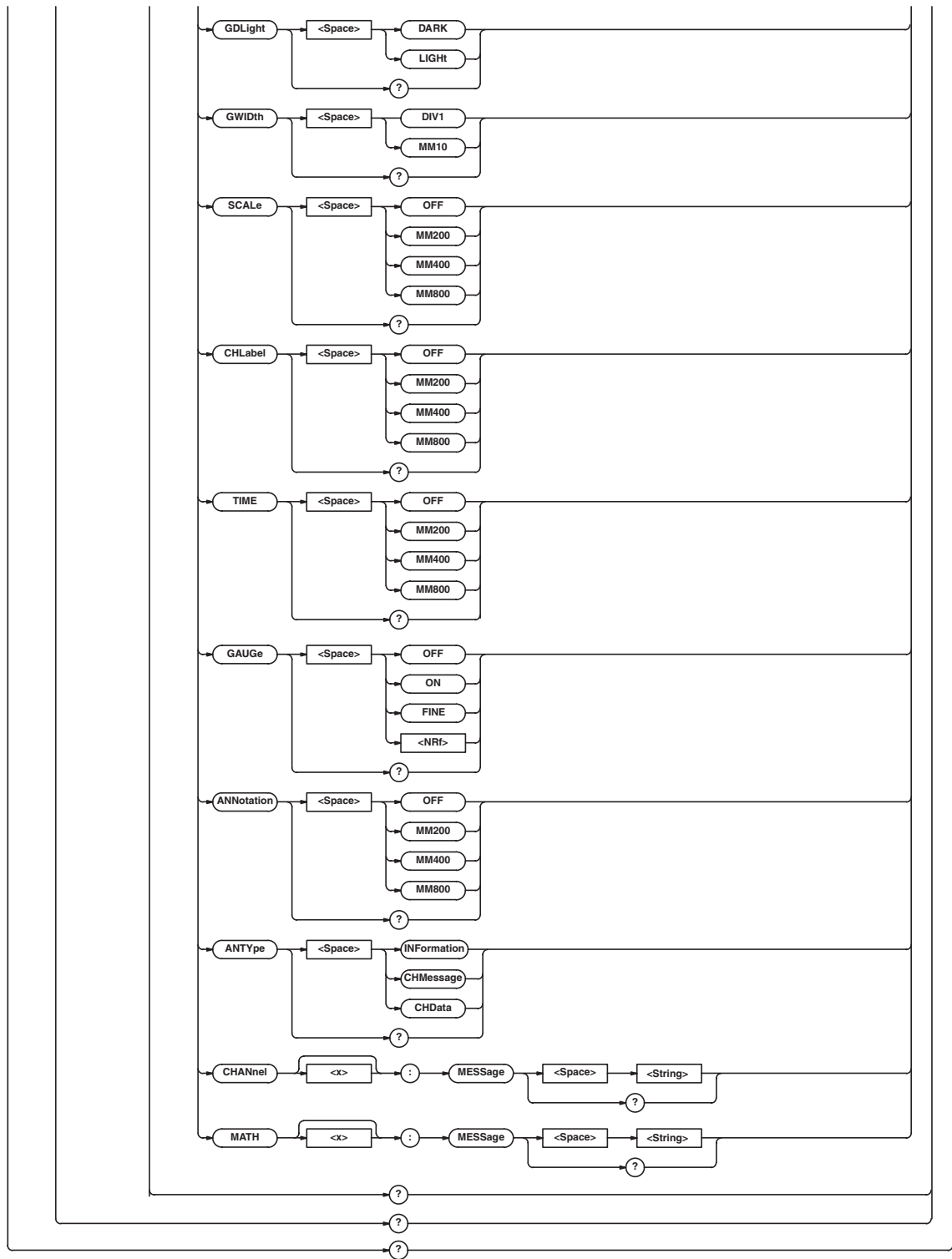
The commands in this group deal with the printing of screen image to the built-in printer and other printers. You can make the same settings, execute the same operations, and make the same inquiries as when you press the MENU key > PRINT soft key on the front panel.







6.11 HCOPY Group



:HCOpy? (Hard COPY)

Function Queries all settings related to the printing of screen images.

Syntax :HCOpy?

Example :HCOpy? -> :HCOpy:
DIRECTION PRINTER;PRINTER:
TYPE NORMAL;RANGE -5.0000000,
5.0000000;:HCOpy:COMMENT "
EXTPRINTER:TYPE ESCP;TONE 0;
SELECT NAN;:HCOpy:NETPRINT:
TYPE ESCP;TONE 0;:HCOpy:PDF:
PSIZE BUILTIN;
ORIENTATION LANDSCAPE;DPPAGE 20;
TITLE "";AUTHOR "";SUBTITLE "
KEYWORD "";COLOR 0;COMPRESSION 0;
SAVE:ANAMING NUMBERING;NAME "
HCOpy:PSETUP:EAREA 0;FLEXIBLEZONE:
MODE 0;CHANNEL:UPPER 100;LOWER 0;:
HCOpy:PSETUP:FLEXIBLEZONE:CHANNEL2:
UPPER 100;LOWER 0;:HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL3:UPP 100;
LOW 0;:HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL4:UPPER 100;LOWER 0;:
HCOpy:PSETUP:FLEXIBLEZONE:CHANNEL5:
UPPER 100;LOWER 0;:HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL6:UPPER 100;
LOWER 0;:HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL7:UPPER 100;LOWER 0;:HCOpy:
PSETUP:FLEXIBLEZONE:CHANNEL8:
UPPER 100;LOWER 0;:HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL9:UPPER 100;
LOWER 0;:HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL10:UPPER 100;LOWER 0;:
HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL11:UPPER 100;LOWER 0;:HCOpy:
PSETUP:FLEXIBLEZONE:CHANNEL12:
UPPER 100;LOWER 0;:HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL13:UPPER 100;
LOWER 0;:HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL14:UPPER 100;LOWER 0;:HCOpy:
PSETUP:FLEXIBLEZONE:CHANNEL15:
UPPER 100;LOWER 0;:HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL16:UPPER 100;
LOWER 0;:HCOpy:PSETUP:FLEXIBLEZONE:
MATH1:UPPER 100;LOWER 0;:HCOpy:
PSETUP:FLEXIBLEZONE:MATH2:
UPPER 100;LOWER 0;:HCOpy:PSETUP:
FLEXIBLEZONE:MATH3:UPPER 100;
LOWER 0;:HCOpy:PSETUP:FLEXIBLEZONE:
MATH4:UPPER 100;LOWER 0;:HCOpy:
PSETUP:FLEXIBLEZONE:MATH5:
UPPER 100;LOWER 0;:HCOpy:PSETUP:
FLEXIBLEZONE:MATH6:UPPER 100;
LOWER 0;:HCOpy:PSETUP:FLEXIBLEZONE:
MATH7:UPPER 100;LOWER 0;:HCOpy:
PSETUP:FLEXIBLEZONE:MATH8:
UPPER 100;LOWER 0;:HCOpy:PSETUP:
GDLIGHT LIGHT;GWIDTH DIV1;
SCALE OFF;CHLABEL OFF;TIME OFF;
GAUGE 0;ANNOTATION MM200;
ANTYPE INFORMATION;CHANNEL1:
MESSAGE "";:HCOpy:PSETUP:CHANNEL2:
MESSAGE "";:HCOpy:PSETUP:CHANNEL3:
MESSAGE "";:HCOpy:PSETUP:CHANNEL4:
MESSAGE "";:HCOpy:PSETUP:CHANNEL5:
MESSAGE "";:HCOpy:PSETUP:CHANNEL6:
MESSAGE "";:HCOpy:PSETUP:CHANNEL7:

MESSAGE "";:HCOpy:PSETUP:CHANNEL8:
MESSAGE "";:HCOpy:PSETUP:CHANNEL9:
MESSAGE "";:HCOpy:PSETUP:CHANNEL10:
MESSAGE "";:HCOpy:PSETUP:CHANNEL11:
MESSAGE "";:HCOpy:PSETUP:CHANNEL12:
MESSAGE "";:HCOpy:PSETUP:CHANNEL13:
MESSAGE "";:HCOpy:PSETUP:CHANNEL14:
MESSAGE "";:HCOpy:PSETUP:CHANNEL15:
MESSAGE "";:HCOpy:PSETUP:CHANNEL16:
MESSAGE "";:HCOpy:PSETUP:MATH1:
MESSAGE "";:HCOpy:PSETUP:MATH2:
MESSAGE "";:HCOpy:PSETUP:MATH3:
MESSAGE "";:HCOpy:PSETUP:MATH4:
MESSAGE "";:HCOpy:PSETUP:MATH5:
MESSAGE "";:HCOpy:PSETUP:MATH6:
MESSAGE "";:HCOpy:PSETUP:MATH7:
MESSAGE "";:HCOpy:PSETUP:MATH8:
MESSAGE ""

:HCOpy:ABORT

Function Aborts printing and paper feeding.

Syntax :HCOpy:ABORT

Example :HCOpy:ABORT

:HCOpy:COMMeNT

Function Sets the comment at the lower right corner of the screen or queries the current setting.

Syntax :HCOpy:COMMENT <String>
:HCOpy:COMMeNT?
<String>=Up to 20 characters

Example :HCOpy:COMMENT "THIS IS TEST."
:HCOpy:COMMENT? -> :HCOpy:
COMMENT "THIS IS TEST."

:HCOpy:DIREction

Function Sets the print destination or queries the current setting.

Syntax :HCOpy:DIREction
{EXTPrinter|PDF|PRINTER|NETPrint}
:HCOpy:DIREction?

Example :HCOpy:DIREction PRINTER
:HCOpy:DIREction? -> :HCOpy:
DIRECTION PRINTER

Description "NETPrint" can be used when the Ethernet interface (optional) is installed.

:HCOpy:EXECute

Function Executes printing. This is an overlap command.

Syntax :HCOpy:EXECute

Example :HCOpy:EXECUTE

:HCOpy:EXTPrinter?

Function Queries all settings related to printing to an external printer (USB printer).

Syntax :HCOpy:EXTPrinter?

Example :HCOpy:EXTPRINTER? -> :HCOpy:
EXTPRINTER:TYPE PCL5;TONE 1;
SELECT NAN

6.11 HCOpy Group

:HCOpy:EXTPrinter:PRINter?

Function Outputs the addresses of all the printers that are currently connected.

Syntax :HCOpy:EXTPrinter:PRINter?

Example (The following is an example when printers are connected to address 2 and 3.)
:HCOpy:EXTPRINTER:PRINTER? ->
:HCOpy:EXTPRINTER:PRINTER 2,3

:HCOpy:EXTPrinter:SElect

Function Sets the address of the target printer or queries the current setting.

Syntax :HCOpy:EXTPrinter:SElect {<Nrf>}
:HCOpy:EXTPrinter:SElect?
<Nrf>=1 to 127

Example :HCOpy:EXTPRINTER:SELECT 3
:HCOpy:EXTPRINTER:SELECT? ->
:HCOpy:EXTPRINTER:SELECT 3

Description If you specify an address where no printer is connected, an error occurs. If a query is made to an address where no printer is connected, "NAN (Not A Number)" is returned.

:HCOpy:EXTPrinter:TONE

Function Turns ON/OFF color printing on the external printer (USB printer) or queries the current setting.

Syntax :HCOpy:EXTPrinter:TONE {<Boolean>}
:HCOpy:EXTPrinter:TONE?

Example :HCOpy:EXTPRINTER:TONE ON
:HCOpy:EXTPRINTER:TONE? -> :HCOpy:EXTPRINTER:TONE 1

:HCOpy:EXTPrinter:TYPE

Function Sets the output format and output resolution for printing to the external printer (USB printer) or queries the current setting.

Syntax :HCOpy:EXTPrinter:TYPE{BJ,<Nrf>|
ESCP|LIPS|PCL5|ESCP2|ESCP}
:HCOpy:EXTPrinter:TYPE?
<Nrf>=180, 300, 360, or 600 (dpi)

Example :HCOpy:EXTPRINTER:TYPE BJ,360
:HCOpy:EXTPRINTER:TYPE? -> :HCOpy:EXTPRINTER:TYPE BJ,360

Description <Nrf> is specified only when the type is set to "BJ."

:HCOpy:NETPrint?

Function Queries all settings related to printing on a network printer.

Syntax :HCOpy:NETPrint?

Example :HCOpy:NETPRINT? ->
:HCOpy:NETPRINT:TYPE POSTSCRIPT;
TONE 1

Description Can be used when the Ethernet interface (option) is installed.

:HCOpy:NETPrint:TONE

Function Turns ON/OFF color printing on the network printer or queries the current setting.

Syntax :HCOpy:NETPrint:TONE {<Boolean>}
:HCOpy:NETPrint:TONE?

Example :HCOpy:NETPRINT:TONE ON
:HCOpy:NETPRINT:TONE? -> :HCOpy:NETPRINT:TONE 1

Description Can be used when the Ethernet interface (option) is installed.

:HCOpy:NETPrint:TYPE

Function Sets the output format and output resolution for printing to the network printer or queries the current setting.

Syntax :HCOpy:NETPrint:TONE {BJ,
<Nrf>|ESCP|LIPS|PCL5|ESCP2|PSCRIPT}
:HCOpy:NETPrint:TYPE?
<Nrf>=180, 300, 360, 600(dpi)

Example :HCOpy:NETPRINT:TYPE PSCRIPT
:HCOpy:NETPRINT:TYPE? -> :HCOpy:NETPRINT:TYPE PSCRIPT

Description • <Nrf> is specified only when the type is set to "BJ."
• Can be used when the Ethernet interface (option) is installed.

:HCOpy:PDF?

Function Queries all settings related to the PDF file generation.

Syntax :HCOpy:PDF?

Example :HCOpy:PDF:PSIZE A3;ORIENTATION
LANDSCAPE;DPPAGE 25;TITLE "";
AUTHOR "";SUBTITLE "";KEYWORD "";
COLOR 0;COMPRESSION 0;SAVE:
ANAMING NUMBERING;NAME ""

:HCOpy:PDF:AUTHor

Function Sets the author of the PDF file or queries the current setting.

Syntax :HCOpy:PDF:AUTHor {<String>}
:HCOpy:PDF:AUTHor?
<String>=Up to 30 characters

Example :HCOpy:PDF:AUTHOR "PDF_AUTHOR"
:HCOpy:PDF:AUTHOR? ->
:HCOpy:PDF:AUTHOR "PDF_AUTHOR"

:HCOpy:PDF:COLor

Function Sets color or monochrome for the PDF file or queries the current setting (ON = color, OFF = monochrome).

Syntax :HCOpy:PDF:COLor {<Boolean>}
:HCOpy:PDF:COLor?

Example :HCOpy:PDF:COLOR ON
:HCOpy:PDF:COLOR? ->
:HCOpy:PDF:COLOR 1

:HCOpy:PDF:COMPression

Function Sets the compression of the PDF file or queries the current setting.

Syntax :HCOpy:PDF:COMPression {<Boolean>}
:HCOpy:PDF:COMPression?

Example :HCOpy:PDF:COMPRESSION ON
:HCOpy:PDF:COMPRESSION? ->
:HCOpy:PDF:COMPRESSION 1

:HCOpy:PDF:DPPage

Function Sets the number of divisions per page of the PDF file or queries the current setting.

Syntax :HCOpy:PDF:DPPage {<Nrf>}
:HCOpy:PDF:DPPage?
<Nrf>=1 to 40

Example :HCOpy:PDF:DPPAGE 10
:HCOpy:PDF:DPPAGE? ->
:HCOpy:PDF:DPPAGE 10

Description There is a limitation on the selectable values depending on the paper size and orientation settings.

:HCOpy:PDF:KEYWord

Function Sets the keyword of the PDF file or queries the current setting.

Syntax :HCOpy:PDF:KEYWord {<String>}
:HCOpy:PDF:KEYWord?
<String>=Up to 90 characters

Example :HCOpy:PDF:KEYWORD "PDF_KEYWORD"
:HCOpy:PDF:KEYWORD? ->
:HCOpy:PDF:KEYWORD "PDF_KEYWORD"

:HCOpy:PDF:ORIENTATION

Function Sets the orientation (portrait or landscape) of the PDF output or queries the current setting.

Syntax :HCOpy:PDF:ORIENTATION {LANDscape|PORTRait}
:HCOpy:PDF:ORIENTATION?

Example :HCOpy:PDF:ORIENTATION LANDSCAPE
:HCOpy:PDF:ORIENTATION? ->
:HCOpy:PDF:ORIENTATION LANDSCAPE

:HCOpy:PDF:PSIZE

Function Sets the paper size of the PDF file or queries the current setting.

Syntax :HCOpy:PDF:PSIZE {A3|A4|A5|BUILTIn}
:HCOpy:PDF:PSIZE?

Example :HCOpy:PDF:PSIZE BUILTIN
:HCOpy:PDF:PSIZE? ->
:HCOpy:PDF:PSIZE BUILTIN

:HCOpy:PDF:SUBTitle

Function Sets the subtitle of the PDF file or queries the current setting.

Syntax :HCOpy:PDF:SUBTitle {<String>}
:HCOpy:PDF:SUBTitle?
<String>=Up to 30 characters

Example :HCOpy:PDF:SUBTITLE "PDF_SUBTITLE"
:HCOpy:PDF:SUBTITLE? ->
:HCOpy:PDF:SUBTITLE "PDF_SUBTITLE"

:HCOpy:PDF:TITLE

Function Sets the title of the PDF file or queries the current setting.

Syntax :HCOpy:PDF:TITLE {<String>}
:HCOpy:PDF:TITLE?
<String>=Up to 30 characters

Example :HCOpy:PDF:TITLE "PDF_TITLE"
:HCOpy:PDF:TITLE? ->
:HCOpy:PDF:TITLE "PDF_TITLE"

:HCOpy:PDF:SAVE?

Function Queries all settings related to the saving of the PDF file to the storage medium.

Syntax :HCOpy:PDF:SAVE?

Example :HCOpy:PDF:SAVE? ->
:HCOpy:PDF:SAVE:ANAMING NUMBERING;
NAME "PDF"

:HCOpy:PDF:SAVE:ANAMING

Function Sets the auto naming function of the saved files or queries the current setting.

Syntax :HCOpy:PDF:SAVE:ANAMING {DATE|NUMBERING|OFF}
:HCOpy:PDF:SAVE:ANAMING?

Example :HCOpy:PDF:SAVE:ANAMING DATE
:HCOpy:PDF:SAVE:ANAMING? ->
:HCOpy:PDF:SAVE:ANAMING DATE

:HCOpy:PDF:SAVE:CDIRECTory

Function Changes the save destination directory.

Syntax :HCOpy:PDF:SAVE:
CDIRECTory {<String>}
<String>=Up to 16 characters

Example :HCOpy:PDF:SAVE:CDIRECTORY "NO_1"

:HCOpy:PDF:SAVE:DRIVE

Function Sets the save destination storage medium.

Syntax :HCOpy:PDF:SAVE:DRIVE
{SCSI,<Nrf>{,<Nrf>}|PCCard,{<Nrf>}|NETWork|USB,<Nrf>{,<Nrf>}{,<Nrf>}}
<Nrf> of PCCard = Partitions (0 to 3)
The first <Nrf> of USB = USB address
The second <Nrf> of USB = Partition (0 to 3) or LUN (logical unit number: 0 to 3)
The third <Nrf> of USB = Partition (0 to 3) when LUN is specified in the second <Nrf>

Example :HCOpy:PDF:SAVE:DRIVE SCSI,4,1

Description

- If the drive does not contain partitions, omit the <Nrf> corresponding to partitions. "NETWork" can be used when the Ethernet interface (option) is installed.
- The second or third <Nrf> when USB is selected can be omitted if the drive is not partitioned or divided by LUN.

:HCOpy:PDF:SAVE:NAME

Function Sets the name of the file to be saved or queries the current setting.

Syntax :HCOpy:PDF:SAVE:NAME <Filename>
:HCOpy:PDF:SAVE:NAME?

Example :HCOpy:PDF:SAVE:NAME "PDF"
:HCOpy:PDF:SAVE:NAME? ->
:HCOpy:PDF:SAVE:NAME "PDF"

:HCOpy:PDF:SAVE:PATH?

Function Queries the current directory.

Syntax :HCOpy:PDF:SAVE:PATH?

Example :HCOpy:PDF:SAVE:PATH? ->
:HCOpy:PDF:SAVE:PATH
"Path=PC_Card_PDF"

:HCOpy:PRINTER?

Function Queries all settings related to printing on the built-in printer.

Syntax :HCOpy:PRINTER?

Example :HCOpy:PRINTER? -> :HCOpy:PRINTER:
TYPE LONG;MAG 20.00E-03;
RANGE -5.0000000,5.0000000

:HCOpy:PRINTER:FEED

Function Executes paper feeding on the built-in printer. This is an overlap command.

Syntax :HCOpy:PRINTER:FEED

Example :HCOpy:PRINTER:FEED

6.11 HCOpy Group

:HCOpy:PRINter:MAG

Function	Sets the magnification for fine print (long) or zoom print when making measurements using an external clock or queries the current setting.
Syntax	:HCOpy:PRINter:MAG {<NRf>} :HCOpy:PRINter:MAG? <NRf>=1 to 100000000 (see the <i>User's Manual</i>)
Example	:HCOpy:PRINter:MAG 10 :HCOpy:PRINter:MAG? -> :HCOpy:PRINter:MAG 10.0
Description	When making a fine print (long) or zoom print of the waveform measured using the external clock, set the print length using the magnification.

:HCOpy:PRINter:RANGE

Function	Sets the print range for fine print (long) or A4 print on the built-in printer or queries the current setting.
Syntax	:HCOpy:PRINter:RANGE {<NRf>}, {<NRf>} :HCOpy:PRINter:RANGE? <NRf>=-5.00 to 5.00 (10 div/record length steps)
Example	:HCOpy:PRINter:RANGE -5.0,5.0 :HCOpy:PRINter:RANGE? -> :HCOpy:PRINter:RANGE -5.0000000,5.0000000

:HCOpy:PRINter:RATE

Function	Sets the magnification (set in terms of the record time) for fine copy when the measurement is performed using the internal clock.
Syntax	:HCOpy:PRINter:RATE {<Time> MIN1 MIN5 MIN10 MIN20 MIN30 MIN50 MIN100 HOUR1 HOUR2 HOUR5 HOUR10 HOUR20 HOUR30 HOUR50 HOUR100 DAY5 DAY10 DAY20 DAY30} :HCOpy:PRINter:RATE? <Time> = See the <i>SL1400 User's Manual</i> .
Example	:HCOpy:PRINter:RATE 1MS :HCOpy:PRINter:RATE? -> :HCOpy:PRINter:RATE 1.000E-03
Description	Sets the print length in terms of a record time value when making a fine copy of the waveform measured using the internal clock.

:HCOpy:PRINter:TYPE

Function	Sets the output format (normal, fine print (long), zoom print, or A4 print) when printing on the built-in printer or queries the current setting.
Syntax	:HCOpy:PRINter:TYPE {NORMAL LONG ZOOM A4Print} :HCOpy:PRINter:TYPE?
Example	:HCOpy:PRINter:TYPE LONG :HCOpy:PRINter:TYPE? -> :HCOpy:PRINter:TYPE LONG
Description	• To set the output format to Fine, select LONG.

:HCOpy:PSETup?

Function	Queries all settings related to the print setting of the screen image.
Syntax	:HCOpy:PSETup?
Example	:HCOpy:PSETup? -> :HCOpy:PSETUP:EAREA 0;FLEXIBLEZONE: MODE 0;CHANNEL1:UPPER 100;LOWER 0;; HCOpy:PSETUP:FLEXIBLEZONE:CHANNEL2: UPPER 100;LOWER 0;;HCOpy:PSETUP: FLEXIBLEZONE:CHANNEL3:UPPER 100; LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE: CHANNEL4:UPPER 100;LOWER 0;;HCOpy: PSETUP:FLEXIBLEZONE:CHANNEL5: UPPER 100;LOWER 0;;HCOpy:PSETUP: FLEXIBLEZONE:CHANNEL6:UPPER 100; LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE: CHANNEL7:UPPER 100;LOWER 0;;HCOpy: PSETUP:FLEXIBLEZONE:CHANNEL8: UPPER 100;LOWER 0;;HCOpy:PSETUP: FLEXIBLEZONE:CHANNEL9:UPPER 100; LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE: CHANNEL10:UPPER 100;LOWER 0;;HCOpy: PSETUP:FLEXIBLEZONE:CHANNEL11: UPPER 100;LOWER 0;;HCOpy:PSETUP: FLEXIBLEZONE:CHANNEL12:UPPER 100; LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE: CHANNEL13:UPPER 100;LOWER 0;;HCOpy: PSETUP:FLEXIBLEZONE:CHANNEL14: UPPER 100;LOWER 0;;HCOpy:PSETUP: FLEXIBLEZONE:CHANNEL15:UPPER 100; LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE: CHANNEL16:UPPER 100;LOWER 0;; HCOpy:PSETUP:FLEXIBLEZONE:MATH1: UPPER 100;LOWER 0;;HCOpy:PSETUP: FLEXIBLEZONE:MATH2:UPPER 100; LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE: MATH3:UPPER 100;LOWER 0;;HCOpy: PSETUP:FLEXIBLEZONE:MATH4: UPPER 100;LOWER 0;;HCOpy:PSETUP: FLEXIBLEZONE:MATH5:UPPER 100; LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE: MATH6:UPPER 100;LOWER 0;;HCOpy: PSETUP:FLEXIBLEZONE:MATH7: UPPER 100;LOWER 0;;HCOpy:PSETUP: FLEXIBLEZONE:MATH8:UPPER 100; LOWER 0;;HCOpy:PSETUP: GDLIGHT LIGHT;GWIDTH DIV1; SCALE OFF;CHLABEL OFF;TIME OFF; GAUGE 0;ANNOTATION MM200; ANTYPE INFORMATION;CHANNEL1: MESSAGE "":HCOpy:PSETUP:CHANNEL2: MESSAGE "":HCOpy:PSETUP:CHANNEL3: MESSAGE "":HCOpy:PSETUP:CHANNEL4: MESSAGE "":HCOpy:PSETUP:CHANNEL5: MESSAGE "":HCOpy:PSETUP:CHANNEL6: MESSAGE "":HCOpy:PSETUP:CHANNEL7: MESSAGE "":HCOpy:PSETUP:CHANNEL8: MESSAGE "":HCOpy:PSETUP:CHANNEL9: MESSAGE "":HCOpy:PSETUP:CHANNEL10: MESSAGE "":HCOpy:PSETUP:CHANNEL11: MESSAGE "":HCOpy:PSETUP:CHANNEL12: MESSAGE "":HCOpy:PSETUP:CHANNEL13: MESSAGE "":HCOpy:PSETUP:CHANNEL14: MESSAGE "":HCOpy:PSETUP:CHANNEL15: MESSAGE "":HCOpy:PSETUP:CHANNEL16: MESSAGE "":HCOpy:PSETUP:MATH1: MESSAGE "":HCOpy:PSETUP:MATH2:

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MESSAGE " ";HCOpy:PSETUP:MATH3:
MESSAGE " ";HCOpy:PSETUP:MATH4:
MESSAGE " ";HCOpy:PSETUP:MATH5:
MESSAGE " ";HCOpy:PSETUP:MATH6:
MESSAGE " ";HCOpy:PSETUP:MATH7:
MESSAGE " ";HCOpy:PSETUP:MATH8:
MESSAGE ""
```

:HCOpy:PSETup:EAREa

Function Turns ON/OFF the extra area when printing with the display format set to Single/Dual/Triad/Quad or queries the current setting.

Syntax :HCOpy:PSETup: EAREa {<Boolean>}
:HCOpy:PSETup: EAREa?

Example :HCOpy:PSETUP:EAREA ON
:HCOpy:PSETUP:EAREA? ->
:HCOpy:PSETUP:EAREA 1

Description SINGle, DUAL, TRIad, and QUAD correspond to 1 ZONE, 2 ZONE, 3 ZONE, and 4 ZONE, respectively.

:HCOpy:PSETup:FLEXiblezone?

Function Queries all settings related to flexible zone recording when printing with the format set to Single.

Syntax :HCOpy:PSETup:FLEXiblezone?

Example :HCOpy:PSETup:FLEXiblezone? ->
:HCOpy:PSETUP:FLEXIBLEZONE:MODE
0;CHANNEL1:UPPER 100;LOWER 0;;
HCOpy:PSETUP:FLEXIBLEZONE:CHANNEL2:
UPPER 100;LOWER 0;;HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL3:UPPER 100;
LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL4:UPPER 100;LOWER 0;;HCOpy:
PSETUP:FLEXIBLEZONE:CHANNEL5:
UPPER 100;LOWER 0;;HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL6:UPPER 100;
LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL7:UPPER 100;LOWER 0;;HCOpy:
PSETUP:FLEXIBLEZONE:CHANNEL8:UPPER
100;LOWER 0;;HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL9:UPPER 100;
LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL10:UPPER 100;LOWER 0;;
HCOpy:PSETUP:FLEXIBLEZONE:CHANNEL11:
UPPER 100;LOWER 0;;HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL12:UPPER 100;
LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL13:UPPER 100;LOWER 0;;HCOpy:
PSETUP:FLEXIBLEZONE:CHANNEL14:
UPPER 100;LOWER 0;;HCOpy:PSETUP:
FLEXIBLEZONE:CHANNEL15:UPPER 100;
LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL16:UPPER 100;LOWER 0;;HCOpy:
PSETUP:FLEXIBLEZONE:MATH1:
UPPER 100;LOWER 0;;HCOpy:PSETUP:
FLEXIBLEZONE:MATH2:UPPER 100;
LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE:
MATH3:UPPER 100;LOWER 0;;HCOpy:
PSETUP:FLEXIBLEZONE:MATH4:
UPPER 100;LOWER 0;;HCOpy:PSETUP:
FLEXIBLEZONE:MATH5:UPPER 100;
LOWER 0;;HCOpy:PSETUP:FLEXIBLEZONE:
MATH6:UPPER 100;LOWER 0;;HCOpy:
PSETUP:FLEXIBLEZONE:MATH7:
UPPER 100;LOWER 0;;HCOpy:PSETUP:
FLEXIBLEZONE:MATH8:UPPER 100;
LOWER 0

:HCOpy:PSETup:FLEXiblezone:MODE

Function Turns ON/OFF the flexible zone area when printing with the display format set to Single or queries the current setting.

Syntax :HCOpy:PSETup:FLEXiblezone:MODE
{<Boolean>}
:HCOpy:PSETup:FLEXiblezone:MODE?

Example :HCOpy:PSETUP:FLEXIBLEZONE:MODE ON
:HCOpy:PSETUP:FLEXIBLEZONE:MODE? ->
:HCOpy:PSETUP:FLEXIBLEZONE:MODE 1

:HCOpy:PSETup:FLEXiblezone:{CHANnel<x>|MATH<x>}:UPPer

Function Sets the upper limit of the flexible zone area of the channel when printing with the display format set to Single or queries the current setting.

Syntax :HCOpy:PSETup:FLEXiblezone:
{CHANnel<x>|MATH<x>}:
UPPer {<NRf>}
:HCOpy:PSETup:FLEXiblezone:
{CHANnel<x>|MATH<x>}:UPPer?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
<NRf>=2 to 100

Example :HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL3:UPPER 50
:HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL3:UPPER? ->
:HCOpy:PSETUP:FLEXIBLEZONE:CHANNEL3:
UPPER 50

Example The value can only be set up to a value that is 2 greater than Lower.

:HCOpy:PSETup:FLEXiblezone:{CHANnel<x>|MATH<x>}:LOWer

Function Sets the lower limit of the flexible zone area of the channel when printing with the display format set to Single or queries the current setting.

Syntax :HCOpy:PSETup:FLEXiblezone:
{CHANnel<x>|MATH<x>}:
LOWer {<NRf>}
:HCOpy:PSETup:FLEXiblezone:{
CHANnel<x>|MATH<x>}:LOWer?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
<NRf>=0 to 98

Example :HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL3:LOWER 10
:HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL3:LOWER? ->
:HCOpy:PSETUP:FLEXIBLEZONE:
CHANNEL3:LOWER 10

Description The value can only be set down to a value that is 2 less than Higher.

:HCOpy:PSETup:GDLight

Function Sets the density of the print graticule or queries the current setting.

Syntax :HCOpy:PSETup:GDLight
{DARK|LIGHT}

Example :HCOpy:PSETup:GDLight?
:HCOpy:PSETUP:GDLIGHT DARK
:HCOpy:PSETUP:GDLIGHT? ->
:HCOpy:PSETUP:GDLIGHT DARK

6.11 HCOpy Group

:HCOpy:PSETup:GWIDTH

Function Sets the print graticule width of the vertical axis or queries the current setting.

Syntax :HCOpy:PSETup:GWIDTH {DIV1|MM10}
:HCOpy:PSETup:GWIDTH?

Example :HCOpy:PSETUP:GWIDTH DIV1
:HCOpy:PSETUP:GWIDTH? ->
:HCOpy:PSETUP:GWIDTH DIV1

:HCOpy:PSETup:SCALE

Function Sets the scale print interval for waveform printing or queries the current setting.

Syntax :HCOpy:PSETup:SCALE {OFF|MM200|MM400|MM800}
:HCOpy:PSETup:SCALE?

Example :HCOpy:PSETUP:SCALE MM200
:HCOpy:PSETUP:SCALE? ->
:HCOpy:PSETUP:SCALE MM200

:HCOpy:PSETup:CHLabel

Function Sets the channel label print interval for waveform printing or queries the current setting.

Syntax :HCOpy:PSETup:CHLabel {OFF|MM200|MM400|MM800}
:HCOpy:PSETup:CHLabel?

Example :HCOpy:PSETUP:CHLABEL MM200
:HCOpy:PSETUP:CHLABEL? ->
:HCOpy:PSETUP:CHLABEL MM200

:HCOpy:PSETup:TIME

Function Sets the time print interval for waveform printing or queries the current setting.

Syntax :HCOpy:PSETup:TIME {OFF|MM200|MM400|MM800}
:HCOpy:PSETup:TIME?

Example :HCOpy:PSETUP:TIME MM200
:HCOpy:PSETUP:TIME? ->
:HCOpy:PSETUP:TIME MM200

:HCOpy:PSETup:GAUGE

Function Turns ON/OFF gauge printing for waveform printing or queries the current setting.

Syntax :HCOpy:PSETup:GAUGE {ON|OFF|FINE}
:HCOpy:PSETup:GAUGE?

Example :HCOpy:PSETUP:GAUGE FINE
:HCOpy:PSETUP:GAUGE? ->
:HCOpy:PSETUP:GAUGE FINE

:HCOpy:PSETup:ANNotation

Function Sets the annotation print interval for waveform printing or queries the current setting.

Syntax :HCOpy:PSETup:ANNotation {OFF|MM200|MM400|MM800}
:HCOpy:PSETup:ANNotation?

Example :HCOpy:PSETUP:ANNOTATION MM200
:HCOpy:PSETUP:ANNOTATION? ->
:HCOpy:PSETUP:ANNOTATION MM200

:HCOpy:PSETup:ANType

Function Sets the annotation content for waveform printing or queries the current setting.

Syntax :HCOpy:PSETup:ANType {INformation|CHMessage|CHData}
:HCOpy:PSETup:ANType?

Example :HCOpy:PSETUP:ANTYPE CHMESSAGE
:HCOpy:PSETUP:ANTYPE? ->
:HCOpy:PSETUP:ANTYPE CHMESSAGE

:HCOpy:PSETup:{CHANnel<x>|MATH<x>}:MESSAge

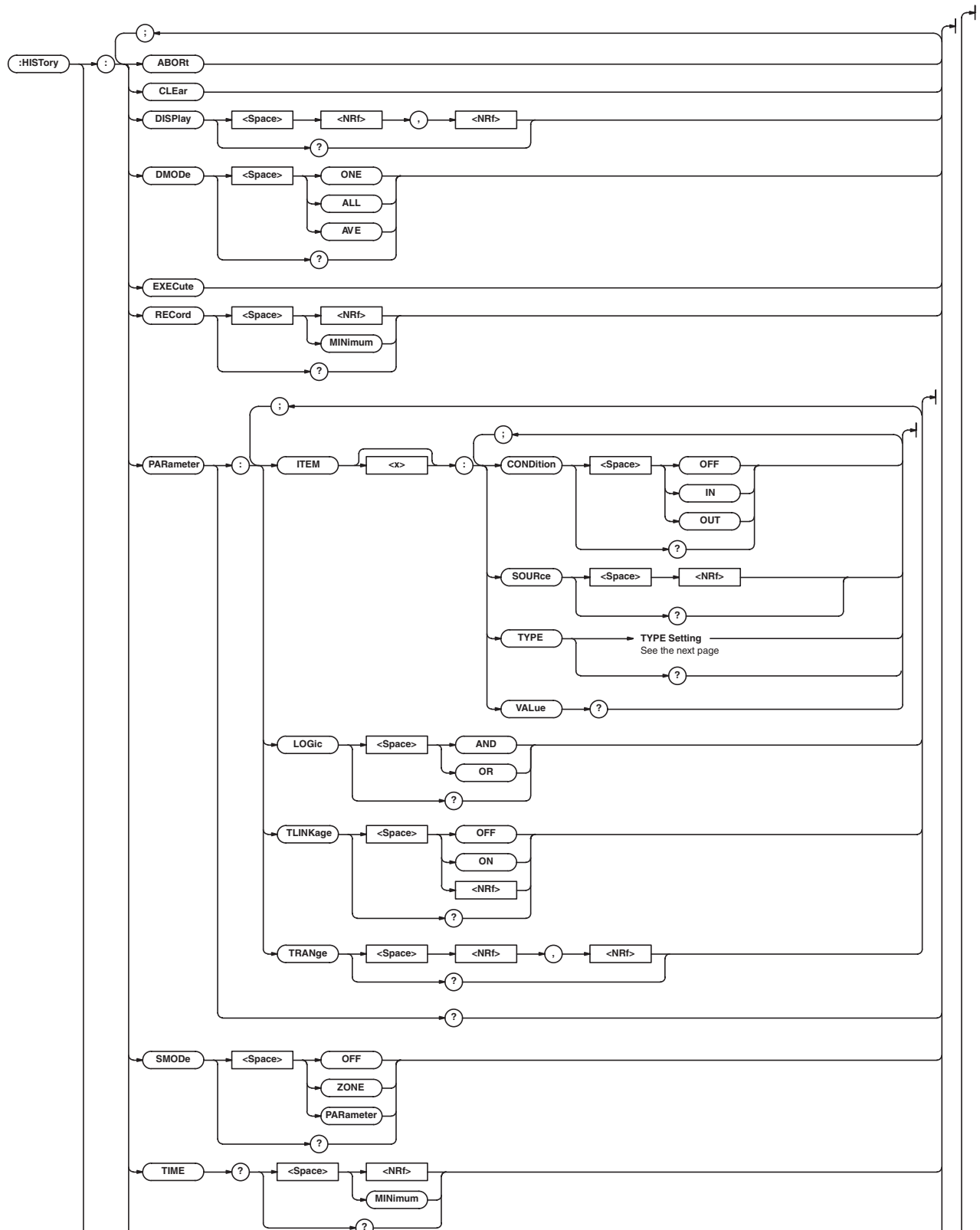
Function Sets the message of the channel for waveform printing or queries the current setting.

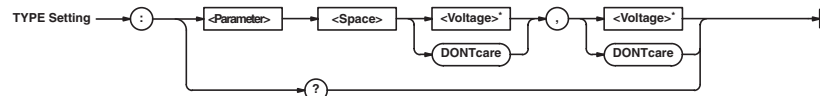
Syntax :HCOpy:PSETup:{CHANnel<x>|MATH<x>}:MESSAge {<String>}
:HCOpy:PSETup:{CHANnel<x>|MATH<x>}:MESSAge?

Example :HCOpy:PSETUP:CHANNEL1:MESSAGE "TRACE1"
:HCOpy:PSETUP:CHANNEL1:MESSAGE? ->
:HCOpy:PSETUP:CHANNEL1:MESSAGE "TRACE1"

6.12 HISTory Group

The commands in this group deal with data loading from the history memory. You can make the same settings, execute the same operations, and make the same inquiries as when the HISTORY key on the front panel is used.





* <Voltage> when <Parameter> is AMPLitude, AVERage, HIGH, LOW, MAXimum, MIDDLE, MINimum, PTOPeak, RMS, or SDEViation (except when using a current probe, then it is <Current>. When the coupling is set to TC or when linear scaling is used, it is <NRf>; <Time> when <Parameter> is AVGPPeriod, BWIDth1, BWIDth2, DELay, FALL, NWIDth, PERiod, PWIDth, or RISE; <Frequency> when <Parameter> is AVGFreq or FREQUENCY; and <NRf> when <Parameter> is DUTYcycle, NOVershoot, PNUMber, POVershoot, TY1Integ, TY2Integ, XY1Integ, or XY2Integ.

:HISTory?

Function Queries all settings related to the history memory function.

Syntax :HISTory?

Example :HISTory? -> :HISTory:RECORD 0;
 DMODE ONE;DISPLAY 0,0;SMODE 0;ZONE:
 EDIT1:CONDITION OFF;SOURCE 1;
 HORIZONTAL 0.50,-0.50;
 VERTICAL -3.0000000,-2.5000000;:
 HISTory:ZONE:EDIT2:CONDITION OFF;
 SOURCE 1;HORIZONTAL 0.50,-0.50;
 VERTICAL -1.0000000,-0.5000000;:
 HISTory:ZONE:EDIT3:CONDITION OFF;
 SOURCE 1;HORIZONTAL 0.50,-0.50;
 VERTICAL 1.0000000,1.5000000;:
 HISTory:ZONE:EDIT4:
 CONDITION OFF;SOURCE 1;
 HORIZONTAL 0.50,-0.50;
 VERTICAL 3.0000000,3.5000000;:
 HISTory:ZONE:LOGIC AND

:HISTory:ABORT

Function Aborts the history search.

Syntax :HISTory:ABORT

Example :HISTory:ABORT

:HISTory:CLear

Function Clears the history memory data.

Syntax :HISTory:CLear

Example :HISTory:CLear

Description Executing this command will clear all the waveform data.

:HISTory:DISPlay

Function Sets the start number or end number of the display record or queries the current setting.

Syntax :HISTory:DISPlay {<NRf>,<NRf>}
 :HISTory:DISPlay?
 <NRf>=0 to -1999

Example :HISTory:DISPlay -2,-10
 :HISTory:DISPlay? -> :HISTory:
 DISPlay -2,-10

Description The selectable number of records varies depending on the acquisition setting and memory extension.

:HISTory:DMODE (Display Mode)

Function Sets the waveform display format (one waveform, all waveforms, or average) or queries the current setting.

Syntax :HISTory:DMODE {ONE|ALL|AVE}
 :HISTory:DMODE?
 :HISTory:DMODE?

Example :HISTory:DMODE ALL
 :HISTory:DMODE? -> :HISTory:
 DMODE ALL

Description If you specify ALL, the record numbers specified by :HISTory:DISPlay are displayed accumulated.

:HISTory:EXECute

Function Executes the history search. This is an overlap command.

Syntax :HISTory:EXECute

Example :HISTory:EXECUTE

:HISTory:PARAMeter?

Function Queries all settings related to the history search (waveform parameter).

Syntax :HISTory:PARAMeter?

Example :HISTory:PARAMETER? -> :HISTory:
 PARAMETER:ITEM1:CONDITION OFF;
 SOURCE 1;TYPE:PTOPEAK DONTCARE,
 DONTCARE;:HISTory:PARAMETER:ITEM2
 :CONDITION OFF;SOURCE 1;TYPE
 :MAXIMUM DONTCARE,DONTCARE;:HISTory
 :PARAMETER:ITEM3:CONDITION OFF;
 SOURCE 1;TYPE:MINIMUM DONTCARE,
 DONTCARE;:HISTory:PARAMETER:ITEM4
 :CONDITION OFF;SOURCE 1;TYPE:RMS
 DONTCARE,DONTCARE;:HISTory:PARAMETER
 :LOGIC AND;TLINKAGE 0;TRANGE
 5.0000000,5.0000000"

:HISTory:PARAMeter:ITEM<x>?

Function Queries all settings related to each parameter of the history search (waveform parameter).

Syntax :HISTory:PARAMeter:ITEM<x>?
 <x>=1 to 4

Example :HISTory:PARAMETER:ITEM? ->
 :HISTory:PARAMETER:ITEM1:CONDITION
 OFF;SOURCE 1;TYPE:PTOPEAK
 DONTCARE,DONTCARE

:HISTory:PARAMeter:ITEM<x>:CONDition

Function Sets the criteria of each parameter of the history search (waveform parameter) or queries the current setting.

Syntax :HISTory:PARAMeter:ITEM<x>
 :CONDition{OFF|IN|OUT}
 :HISTory:PARAMeter:ITEM <x>
 :SOURce?
 <x>=1 to 4

Example :HISTory:PARAMETER:ITEM:CONDition
 IN
 :HISTory:PARAMETER:ITEM:CONDition?
 -> :HISTory:PARAMETER:ITEM1
 :CONDition IN

:HISTory:PARAMeter:ITEM<x>:SOURce

Function Sets the source trace of each parameter of the history search (waveform parameter) or queries the current setting.

Syntax :HISTory:PARAMeter:ITEM<x>
 :SOURce {<NRf>}
 :HISTory:PARAMeter:ITEM<x>
 :SOURce?
 <x> of ITEM=1 to 4
 <NRf>=1 to 16

Example :HISTory:PARAMETER:ITEM:SOURce
 CHANNEL1
 :HISTory:PARAMETER:ITEM:SOURce? ->
 :HISTory:PARAMETER:ITEM1:SOURce 1

6.12 HISTory Group

:HISTory:PARAmeter:ITEM<x>:TYPE: <Parameter>

Function	Sets the parameter and the upper and lower limits of each parameter of the history search (waveform parameter) or queries the current setting.
Syntax	<pre>:HISTory:PARAmeter:ITEM<x>:TYPE:<Parameter><{Voltage DONTcare}>,<{Voltage DONTcare}> <{Time DONTcare}>,<{Time DONTcare}> <{Frequency DONTcare}>,<{Frequency DONTcare}> <{<Nrf> DONTcare}>,<{<Nrf> DONTcare}>:HISTory:PARAmeter:ITEM<x>:TYPE?<x>=1 to 4<Parameter>={AMPLitude AVERage AVGFreq AVGPeriod BWIDth1 BWIDth2 DELay DUTYcycle FALL FREQuency HIGH LOW MAXimum MIDDLE MINimum NOVershoot NWIDTH PERiod PNUMBER POVershoot PTOPeak PWIDth RISE RMS SDEVIation TY1Integ TY2Integ XY1Integ XY2Integ}<Voltage>,<Time>,<Frequency>,<Nrf> = See the <i>User's Manual</i>.</pre>
Example	<pre>:HISTory:PARAmeter:ITEM:TYPE:PTOPeak -1,1:HISTory:PARAmeter:ITEM:TYPE? ->:HISTory:PARAmeter:ITEM1:TYPE:PTOPeak -1.00000E+00,1.00000E+00</pre>

:HISTory:PARAmeter:ITEM<x>:VALue?

Function	Queries the measured value of the specified parameter of the parameter search or queries the current setting.
Syntax	<pre>:HISTory:PARAmeter:ITEM<x>:VALue?<x>=1 to 4</pre>
Example	<pre>:HISTory:PARAmeter:ITEM:VALue? ->:HISTory:PARAmeter:ITEM1:VALue 150.25000E+00</pre>

:HISTory:PARAmeter:LOGIC

Function	Sets the determination logic of the parameter search or queries the current setting.
Syntax	<pre>:HISTory:PARAmeter:LOGIC {AND OR}:HISTory:PARAmeter:LOGIC?</pre>
Example	<pre>:HISTory:PARAmeter:LOGIC AND:HISTory:PARAmeter:LOGIC? ->:HISTory:PARAmeter:LOGIC AND</pre>

:HISTory:PARAmeter:TLINKage

Function	Turns ON/OFF the linked movement of the determination range cursor of the parameter search.
Syntax	<pre>:HISTory:PARAmeter:TLINKage {<Boolean>}:HISTory:PARAmeter:TLINKage?</pre>
Example	<pre>:HISTory:PARAmeter:TLINKage ON:HISTory:PARAmeter:TLINKage? ->:HISTory:PARAmeter:TLINKage 1</pre>

:HISTory:PARAmeter:TRANge

Function	Sets the range over which to perform the parameter search or queries the current setting.
Syntax	<pre>:HISTory:PARAmeter:TRANge {<Nrf>,<Nrf>}:HISTory:PARAmeter:TRANge?<Nrf> = -5.00 to 5.00 (10 div/record length steps)</pre>
Example	<pre>:HISTory:PARAmeter:TRANge -5,5:HISTory:PARAmeter:TRANge? ->:HISTory:PARAmeter:TRANge -5.0000000,5.0000000</pre>

:HISTory:RECORD

Function	Sets the target record or queries the current setting.
Syntax	<pre>:HISTory:RECORD {<Nrf> MINimum}:HISTory:RECORD?<Nrf>=0 to -1999</pre>
Example	<pre>:HISTory:RECORD 0:HISTory:RECORD? -> :HISTory:RECORD 0</pre>
Description	- Specifying "MINimum" sets the record to the minimum record number. - The selectable target records vary depending on the record length and memory extension settings.

:HISTory:RECORD? MINimum

Function	Queries the minimum record number.
Syntax	<pre>:HISTory:RECORD? MINimum</pre>
Example	<pre>:HISTory:RECORD? MINIMUM ->:HISTory:RECORD -538</pre>
Description	The minimum record number varies depending on the record length and memory extension settings.

:HISTory:SMODE

Function	Sets the history memory search mode or queries the current setting.
Syntax	<pre>:HISTory:SMODE {OFF ZONE PARAmeter}:HISTory:SMODE?</pre>
Example	<pre>:HISTory:SMODE PARAmeter:HISTory:SMODE? -> :HISTory:SMODE PARAmeter</pre>

:HISTory:TIME?

Function	Queries the trigger time of the target record number.
Syntax	<pre>:HISTory:TIME? {<Nrf> MINimum}<Nrf>=0 to -1999</pre>
Example	<pre>:HISTory:TIME? -1 -> :HIST:TIME "-0001 10:20:30.04"</pre>
Description	- Specifying "MINimum" sets the record to the minimum record number. - The selectable target records vary depending on the record length and memory extension settings.

:HISTory:ZONE?

Function Queries all settings related to the zone search.

Syntax **:HISTory:ZONE?**

Example **:HISTory:ZONE? -> :HISTory:ZONE:
EDIT1:CONDITION OFF;SOURCE 1;
HORIZONTAL 0.50,-0.50;
VERTICAL -3.0000000,-2.5000000;;
HISTory:ZONE:EDIT2:CONDITION OFF;
SOURCE 1;HORIZONTAL 0.50,-0.50;
VERTICAL -1.0000000,-0.5000000;;
HISTory:ZONE:EDIT3:CONDITION OFF;
SOURCE 1;HORIZONTAL 0.50,-0.50;
VERTICAL 1.0000000,1.5000000;;
HISTory:ZONE:EDIT4:CONDITION OFF;
SOURCE 1;HORIZONTAL 0.50,-0.50;
VERTICAL 3.0000000,3.5000000;;
HISTory:ZONE:LOGIC AND**

:HISTory:ZONE:EDIT<x>?

Function Queries all settings related to the specified search zone.

Syntax **:HISTory:ZONE:EDIT<x>?**
<x>=1 to 4

Example **:HISTory:ZONE:EDIT1? ->
:HISTory:ZONE:
EDIT1:CONDITION OFF;SOURCE 1;
HORIZONTAL 0.50,-0.50;
VERTICAL -3.0000000,-1.0000000**

:HISTory:ZONE:EDIT<x>:CONDition

Function Sets the search condition of the specified zone cursor or queries the current setting.

Syntax **:HISTory:ZONE:EDIT<x>:CONDition**
{OFF|IN|OUT}
:HISTory:ZONE:EDIT<x>:CONDition?
<x>=1 to 4

Example **:HISTory:ZONE:EDIT1:CONDITION IN
:HISTory:ZONE:EDIT1:CONDITION? ->
:HISTory:ZONE:EDIT1:CONDITION IN**

Description Use EDIT<x> to specify the search zone to be registered.

:HISTory:ZONE:EDIT<x>:HORizontal

Function Sets the upper/lower position of the specified search zone or queries the current setting.

Syntax **:HISTory:ZONE:EDIT<x>:HORizontal**
{<NRf>,<NRf>}
:HISTory:ZONE:EDIT<x>:HORizontal?
<x>=1 to 4
**<NRf>=-5 to 5 div (0.01 steps, in the order
Upper and Lower)**

Example **:HISTory:ZONE:EDIT1:
HORIZONTAL 4.00,-4.00
:HISTory:ZONE:EDIT1:HORIZONTAL? ->
:HISTory:ZONE:EDIT1:
HORIZONTAL 4.00,-4.00**

Description Use EDIT<x> to specify the search zone to be registered.

:HISTory:ZONE:EDIT<x>:SOURCE

Function Sets the source waveform of the zone search or queries the current setting.

Syntax **:HISTory:ZONE:EDIT<x>**
:SOURCE {<NRf>}
:HISTory:ZONE:EDIT<x>:SOURCE?
<x> of Edit<x>=1 to 4
<NRf>=1 to 16

Example **:HISTory:ZONE:EDIT1:SOURCE 1
:HISTory:ZONE:EDIT1:SOURCE? ->
:HISTory:ZONE:EDIT1:SOURCE 1**

Description Use EDIT<x> to specify the search zone to be registered.

:HISTory:ZONE:EDIT<x>:VERTical

Function Sets the left/right position of the search zone or queries the current setting.

Syntax **:HISTory:ZONE:EDIT<x>:VERTical**
{<NRf>,<NRf>}
:HISTory:ZONE:EDIT<x>:VERTical?
<x>=1 to 4
**<NRf>=See the *User's Manual* (in the order Left
and Right)**

Example **:HISTory:ZONE:EDIT1:VERTICAL -2,2
:HISTory:ZONE:EDIT1:VERTICAL? ->
:HISTory:ZONE:EDIT1:
VERTICAL -2.0000000,2.0000000**

Description Use EDIT<x> to specify the search zone to be registered.

:HISTory:ZONE:LOGic

Function Sets the search logic condition of the zone search or queries the current setting.

Syntax **:HISTory:ZONE:LOGic {AND|OR}**
:HISTory:ZONE:LOGic?

Example **:HISTory:ZONE:LOGIC AND
:HISTory:ZONE:LOGIC? ->
:HISTory:ZONE:LOGIC AND**

```

graph TD
    IMAGE[IMAGE] --> J1((:))
    J1 --> ABORT[ABORT]
    J1 --> COMMENT[COMMENT]
    COMMENT --> S1[<Space>]
    S1 --> Q1((?))
    Q1 --> S2[<String>]
    J1 --> COMPRESS[COMPRESS]
    COMPRESS --> S3[<Space>]
    S3 --> Q2((?))
    Q2 --> OFF1[OFF]
    Q2 --> ON[ON]
    Q2 --> NR1[<NRf>]
    J1 --> EXECUTE[EXECUTE]
    J1 --> FORMAT[FORMAT]
    FORMAT --> S4[<Space>]
    S4 --> Q3((?))
    Q3 --> BMP[BMP]
    Q3 --> PS[PSCript]
    Q3 --> PNG[PNG]
    Q3 --> JPEG[JPEG]
    J1 --> SAVE[SAVE]
    SAVE --> J2((:))
    J2 --> ANAMING[ANAMING]
    ANAMING --> S5[<Space>]
    S5 --> Q4((?))
    Q4 --> DATE[DATE]
    Q4 --> NUM[NUMBERing]
    Q4 --> OFF2[OFF]
    J2 --> CDIRECTORY[CDIRECTORY]
    CDIRECTORY --> S6[<Space>]
    S6 --> FILENAME1[<Filename>]
    J2 --> DRIVE[DRIVE]
    DRIVE --> S7[<Space>]
    S7 --> SCSI[SCSI]
    SCSI --> C1((,))
    C1 --> NR2[<NRf>]
    NR2 --> C2((,))
    C2 --> NR3[<NRf>]
    S7 --> PC[PCCard]
    PC --> C3((,))
    C3 --> NR4[<NRf>]
    S7 --> NETWORK[NETWork]
    S7 --> USB[USB]
    USB --> C4((,))
    C4 --> NR5[<NRf>]
    J2 --> NAME[NAME]
    NAME --> S8[<Space>]
    S8 --> Q5((?))
    Q5 --> FILENAME2[<Filename>]
    J2 --> PATH[PATH]
    PATH --> Q6((?))
    J2 --> Q7((?))
    J2 --> SEND[SEND]
    SEND --> Q8((?))
    J2 --> TONE[TONE]
    TONE --> S9[<Space>]
    S9 --> Q9((?))
    Q9 --> COLOR[COLor]
    Q9 --> OFF3[OFF]
    Q9 --> REVERSE[REVerse]
    Q9 --> GRAY[GRAY]
    J1 --> Q10((?))
    Q10 --> END(( ))
  
```

: IMAGE?

Function Queries all settings related to the saving of screen image data.

Syntax : IMAGE?

Example : IMAGE? -> : IMAGE:FORMAT BMP;
TONE COLOR;COMMENT "";SAVE:
ANAMING DATE;NAME "ABC";: IMAGE:
COMPRESSION 1

: IMAGE:ABORT

Function Aborts saving the screen image data to the storage medium.

Syntax : IMAGE:ABORT

Example : IMAGE:ABORT

: IMAGE:COMMENT

Function Sets the comment at the lower right corner of the screen or queries the current setting.

Syntax : IMAGE:COMMENT <String>

: IMAGE:COMMENT?

Example : IMAGE:COMMENT "THIS IS TEST."
: IMAGE:COMMENT? -> : IMAGE:
COMMENT "THIS IS TEST."

: IMAGE:COMPRESSION

Function Enables or disables the data compression of screen data in BMP format or queries the current setting.

Syntax : IMAGE:COMPRESSION {<Boolean>}

: IMAGE:COMPRESSION?

Example : IMAGE:COMPRESSION ON
: IMAGE:COMPRESSION? -> : IMAGE:
COMPRESSION 1

Description This setting is valid when saving to the storage medium.

: IMAGE:EXECUTE

Function The screen image data is saved to the storage medium.

Syntax : IMAGE:EXECUTE

Example : IMAGE:EXECUTE

: IMAGE:FORMAT

Function Sets the save format of the screen image data or queries the current setting.

Syntax : IMAGE:FORMAT

{BMP | PScript | PNG | JPEG}

: IMAGE:FORMAT?

Example : IMAGE:FORMAT PNG
: IMAGE:FORMAT? -> : IMAGE:FORMAT PNG

: IMAGE:SAVE?

Function Queries all settings related to the saving of the screen image data to the storage medium.

Syntax : IMAGE:SAVE?

Example : IMAGE:SAVE? -> : IMAGE:SAVE:
ANAMING DATE;NAME "ABC"

: IMAGE:SAVE:ANAMING

Function Sets the auto naming function of the saved files or queries the current setting.

Syntax : IMAGE:ANAMING {DATE | NUMBERING | OFF}

: IMAGE:SAVE:ANAMING?

Example : IMAGE:ANAMING DATE
: IMAGE:SAVE:ANAMING? ->
: IMAGE:SAVE:ANAMING DATE

: IMAGE:SAVE:CDIRECTORY

Function Changes the save destination directory.

Syntax : IMAGE:SAVE:CDIRECTORY <String>
<String>=Up to 16 characters

Example : IMAGE:SAVE:CDIRECTORY "NO_1"

: IMAGE:SAVE:DRIVE

Function Sets the save destination storage medium.

Syntax : IMAGE:SAVE:DRIVE {SCSI,<NRf>,
[<NRf>] | PCCard, [<NRf>] | NETWORK |
USB,<NRf>[,<NRf>][,<NRf>]}

: IMAGE:SAVE:DRIVE?

The first <NRf> of SCSI=SCSI address (0 to 7)

The second <NRf> of SCSI=Partitions (0 to 2)

<NRf> of PCCard=Partitions (0 to 1)

The first <NRf> of USB = USB address

The second <NRf> of USB = Partition (0 to 3) or

LUN (logical unit number: 0 to 3)

The third <NRf> of USB = Partition (0 to 3)

when LUN is specified in the second <NRf>

Example : IMAGE:SAVE:DRIVE NETWORK
: IMAGE:SAVE:DRIVE? -> : IMAGE:SAVE:
DRIVE NETWORK

Description

- If the drive does not contain partitions, omit the <NRf> corresponding to partitions. "NETWork" can be used when the Ethernet interface (option) is installed.
- The REALTIME recording partition (SCSI address = internal ID, partition = 0) cannot be specified.
- The second or third <NRf> when USB is selected can be omitted if the drive is not partitioned or divided by LUN.

: IMAGE:SAVE:NAME

Function Sets the name of the file to be saved or queries the current setting.

Syntax : IMAGE:SAVE:NAME <Filename>
: IMAGE:SAVE:NAME?

Example : IMAGE:SAVE:NAME "DISP_1"
: IMAGE:SAVE:NAME? -> : IMAGE:SAVE:
NAME "DISP_1"

: IMAGE:SAVE:PATH?

Function Queries the current directory.

Syntax : IMAGE:SAVE:PATH?

Example : IMAGE:SAVE:PATH? -> : IMAGE:SAVE:
PATH "Path = HD-0"

: IMAGE:SEND?

Function Queries the screen image data.

Syntax : IMAGE:SEND?

Example : IMAGE:SEND? -> #6(number of bytes, 6
digits)(series of data bytes)

Description

- The number of bytes of <Block data> is {2 + 6 + number of data points + 1 (delimiter)}.
- If you specify : IMAGE:FORMAT PScript, data is not output. "#6000000" is returned.

: IMAGE:TONE

Function Sets the color tone of the screen image data to be saved or queries the current setting.

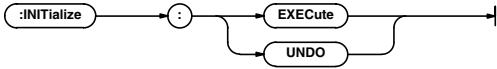
Syntax : IMAGE:TONE
{OFF | COLOR | REVERSE | GRAY}

: IMAGE:TONE?

Example : IMAGE:TONE COLOR
: IMAGE:TONE? -> : IMAGE:TONE COLOR

6.14 INITialize Group

The commands in this group deal with initialization of settings. You can execute the same operation as when you press the MENU key > INITIALIZE/CAL soft key on the front panel.



:INITialize:EXECute

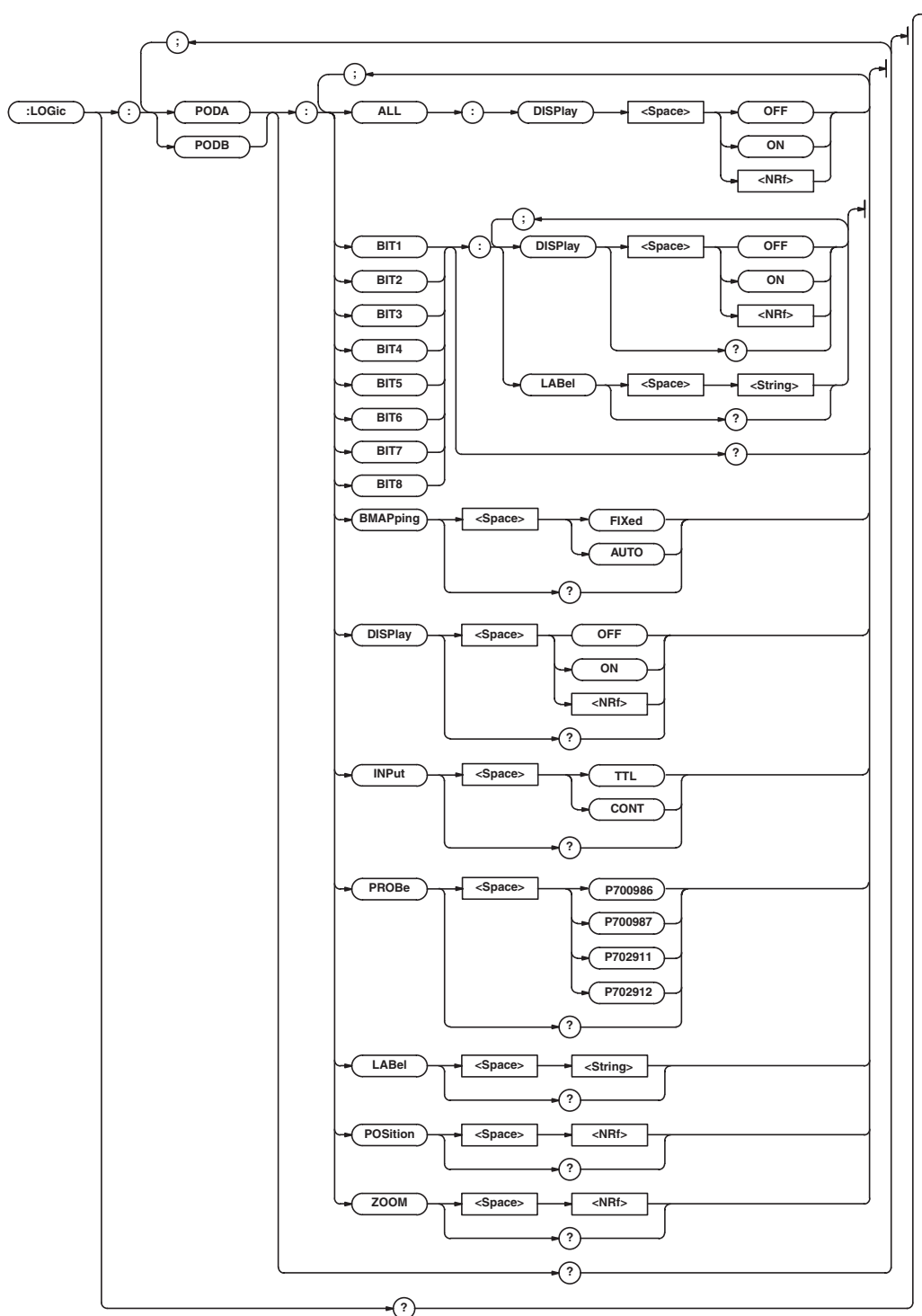
Function Executes the initialization of settings.
Syntax :INITialize:EXECute
Example :INITIALIZE:EXECUTE

:INITialize:UNDO

Function Undoes the initialization of settings.
Syntax :INITialize:UNDO
Example :INITIALIZE:UNDO

6.15 LOGic Group

The commands in this group deal with the logic waveforms. You can make the same settings and inquiries as when you press the CH key > Logic A soft key or the CH key > Logic B soft key on the front panel.



6.15 LOGic Group

:LOGic?

Function Queries all settings related to the logic waveforms.

Syntax :LOGic?

Example :LOGIC? -> :LOGIC:PODA:
POSITION 0.00;ZOOM 2.500;
LABEL "LogicA";BIT1:DISPLAY 0;
LABEL "A-1";:LOGIC:PODA:BIT2:
DISPLAY 1;LABEL "A-2";:LOGIC:PODA:
BIT3:DISPLAY 1;LABEL "A-3";:LOGIC:
PODA:BIT4:DISPLAY 1;LABEL "A-4";:
LOGIC:PODA:BIT5:DISPLAY 1;
LABEL "A-5";:LOGIC:PODA:BIT6:
DISPLAY 1;LABEL "A-6";:LOGIC:PODA:
BIT7:DISPLAY 1;LABEL "A-7";:LOGIC:
PODA:BIT8:DISPLAY 1;LABEL "A-8";:
LOGIC:PODA:BMAPPING AUTO;:LOGIC:
PODB:POSITION 0.00;ZOOM 1.000;
LABEL "LogicB";BIT1:DISPLAY 1;
LABEL "B-1";:LOGIC:PODB:BIT2:
DISPLAY 1;LABEL "B-2";:LOGIC:PODB:
BIT3:DISPLAY 0;LABEL "B-3";:LOGIC:
PODB:BIT4:DISPLAY 1;LABEL "B-4";:
LOGIC:PODB:BIT5:DISPLAY 1;
LABEL "B-5";:LOGIC:PODB:BIT6:
DISPLAY 0;LABEL "B-6";:LOGIC:PODB:
BIT7:DISPLAY 1;LABEL "B-7";:LOGIC:
PODB:BIT8:DISPLAY 1;LABEL "B-8";:
LOGIC:PODB:BMAPPING AUTO

:LOGic:{PODA|PODB}?

Function Queries all settings related to the specified logic waveform.

Syntax :LOGic:{PODA|PODB}?

Example :LOGIC:PODA? -> :LOGIC:PODA:
POSITION 0.00;ZOOM 2.500;
LABEL "LogicA";BIT1:DISPLAY 0;
LABEL "A-1";:LOGIC:PODA:BIT2:
DISPLAY 1;LABEL "A-2";:LOGIC:PODA:
BIT3:DISPLAY 1;LABEL "A-3";:LOGIC:
PODA:BIT4:DISPLAY 1;LABEL "A-4";:
LOGIC:PODA:BIT5:DISPLAY 1;
LABEL "A-5";:LOGIC:PODA:BIT6:
DISPLAY 1;LABEL "A-6";:LOGIC:PODA:
BIT7:DISPLAY 1;LABEL "A-7";:LOGIC:
PODA:BIT8:DISPLAY 1;LABEL "A-8";:
LOGIC:PODA:BMAPPING AUTO

:LOGic:{PODA|PODB}:ALL:DISPlay

Function Turns ON/OFF the display of all bits of the specified logic waveform.

Syntax :LOGic:{PODA|PODB}:ALL:DISPlay
{<Boolean>}

Example :LOGIC:PODA:ALL:DISPlay ON

:LOGic:{PODA|PODB}:{BIT1|BIT2|BIT3|BIT4|BIT5|BIT6|BIT7|BIT8}:DISPlay

Function Turns ON/OFF the display of the bit of the specified logic waveform or queries the current setting.

Syntax :LOGic:{PODA|PODB}:{BIT1|BIT2|BIT3|BIT4|BIT5|BIT6|BIT7|BIT8}:DISPlay
{<Boolean>}

Example :LOGic:{PODA|PODB}:{BIT1|BIT2|BIT3|BIT4|BIT5|BIT6|BIT7|BIT8}:DISPlay?
:LOGIC:PODA:BIT1:DISPlay ON
:LOGIC:PODA:BIT1:DISPlay? ->
:LOGIC:PODA:BIT1:DISPlay 1

:LOGic:{PODA|PODB}:{BIT1|BIT2|BIT3|BIT4|BIT5|BIT6|BIT7|BIT8}:LAbel

Function Sets the label of the bit of the specified logic waveform or queries the current setting.

Syntax :LOGic:{PODA|PODB}:{BIT1|BIT2|BIT3|BIT4|BIT5|BIT6|BIT7|BIT8}:
LAbel <String>
:LOGic:{PODA|PODB}:{BIT1|BIT2|BIT3|BIT4|BIT5|BIT6|BIT7|BIT8}:LAbel?
<String>=Up to 8 characters

Example :LOGIC:PODA:BIT1:LAbel "NO_1"
:LOGIC:PODA:BIT1:LAbel? ->
:LOGIC:PODA:BIT1:LAbel 1

:LOGic:{PODA|PODB}:BMAPPing

Function Sets the bit display position of the specified logic waveform or queries the current setting.

Syntax :LOGic:{PODA|PODB}:BMAPPing
{AUTO|FIXed}

Example :LOGic:{PODA|PODB}:BMAPPing?
:LOGIC:PODA:BMAPPing AUTO
:LOGIC:PODA:BMAPPing? ->
:LOGIC:PODA:BMAPPING AUTO

:LOGic:{PODA|PODB}:DISPlay

Function Turns ON/OFF the display of all bits of the specified logic waveform or queries the current setting.

Syntax :LOGic:{PODA|PODB}:DISPlay
{<Boolean>}

Example :LOGic:{PODA|PODB}:DISPlay?
:LOGIC:PODA:DISPlay ON
:LOGIC:PODA:DISPlay? ->
:LOGIC:PODA:DISPlay 1

:LOGic:{PODA|PODB}:INPut

Function Sets the input of the specified logic waveform or queries the current setting.

Syntax :LOGic:{PODA|PODB}:INPut {TTL|CONT}

Example :LOGic:{PODA|PODB}:INPut?
:LOGIC:PODA:INPut TTL
:LOGIC:PODA:INPut? ->
:LOGIC:PODA:INPut TTL

Description The setting is valid only when the logic probe is 702911 or 702912.

:LOGic:{PODA|PODB}:PROBe

Function Sets the logic probe or queries the current setting.

Syntax :LOGic:{PODA|PODB}:PROBe
{P700986|P700987|P702911|P702912}
:LOGic:{PODA|PODB}: PROBe?

Example :LOGIC:PODA:PROBE P700986
:LOGIC:PODA:PROBE? ->
:LOGIC:PODA:PROBE P700986

:LOGic:{PODA|PODB}:LABel

Function Sets the label of the specified logic waveform or queries the current setting.

Syntax :LOGic:{PODA|PODB}:LABel <String>
:LOGic:{PODA|PODB}:LABel?
<String>=Up to 8 characters

Example :LOGIC:PODA:LABEL "LABEL_A"
:LOGIC:PODA:LABEL? ->
:LOGIC:PODA:LABEL "LABEL_A"

:LOGic:{PODA|PODB}:POSition

Function Sets the vertical position of the specified logic waveform or queries the current setting.

Syntax :LOGic:{PODA|PODB}:POSition {<NRf>}
:LOGic:{PODA|PODB}:POSition?
<NRf>=-5.00 to 5.00 (div, 0.01 div steps)

Example :LOGIC:PODA:POSITION 0.00
:LOGIC:PODA:POSITION? ->
:LOGIC:PODA:POSITION 0.00

:LOGic:{PODA|PODB}:ZOOM

Function Sets the vertical zoom rate of the specified logic waveform or queries the current setting.

Syntax :LOGic:{PODA|PODB}:ZOOM {<NRf>}
:LOGic:{PODA|PODB}:ZOOM?
<NRf>=0.1, 0.111, 0.125, 0.143, 0.167, 0.2, 0.25, 0.33, 0.4, 0.5, 0.556, 0.625, 0.667, 0.714, 0.8, 0.833, 1, 1.11, 1.25, 1.33, 1.43, 1.67, 2, 2.22, 2.5, 3.33, 4, 5, 6.67, 8, 10, 12.5, 16.7, 20, 25, 40, 50, or 100

Example :LOGIC:PODA:ZOOM 2.5
:LOGIC:PODA:ZOOM? -> :LOGIC:PODA:ZOOM 2.500

6.16 LSTart Group

The commands in this group executes log start. Sets the trigger mode to Log and starts the waveform acquisition.



:LSTart (Log START)

Function Executes log start.

Syntax :LSTart

Example :LSATART

:LSTart?

Function Executes log start and waits for the completion.

Syntax :LSTart?

Example :LSTART? -> 0

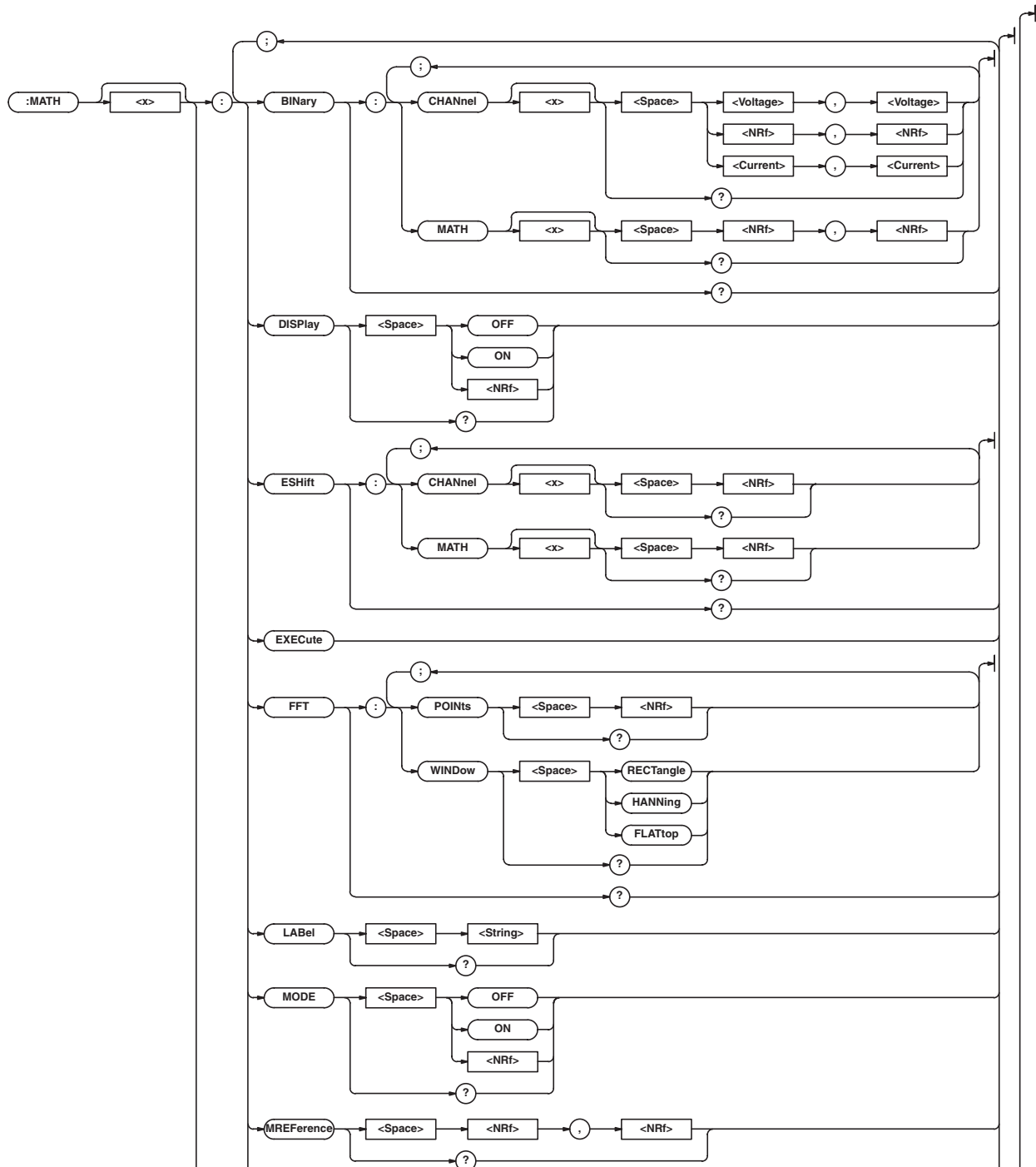
Description When the operation is complete, 0 is always returned.

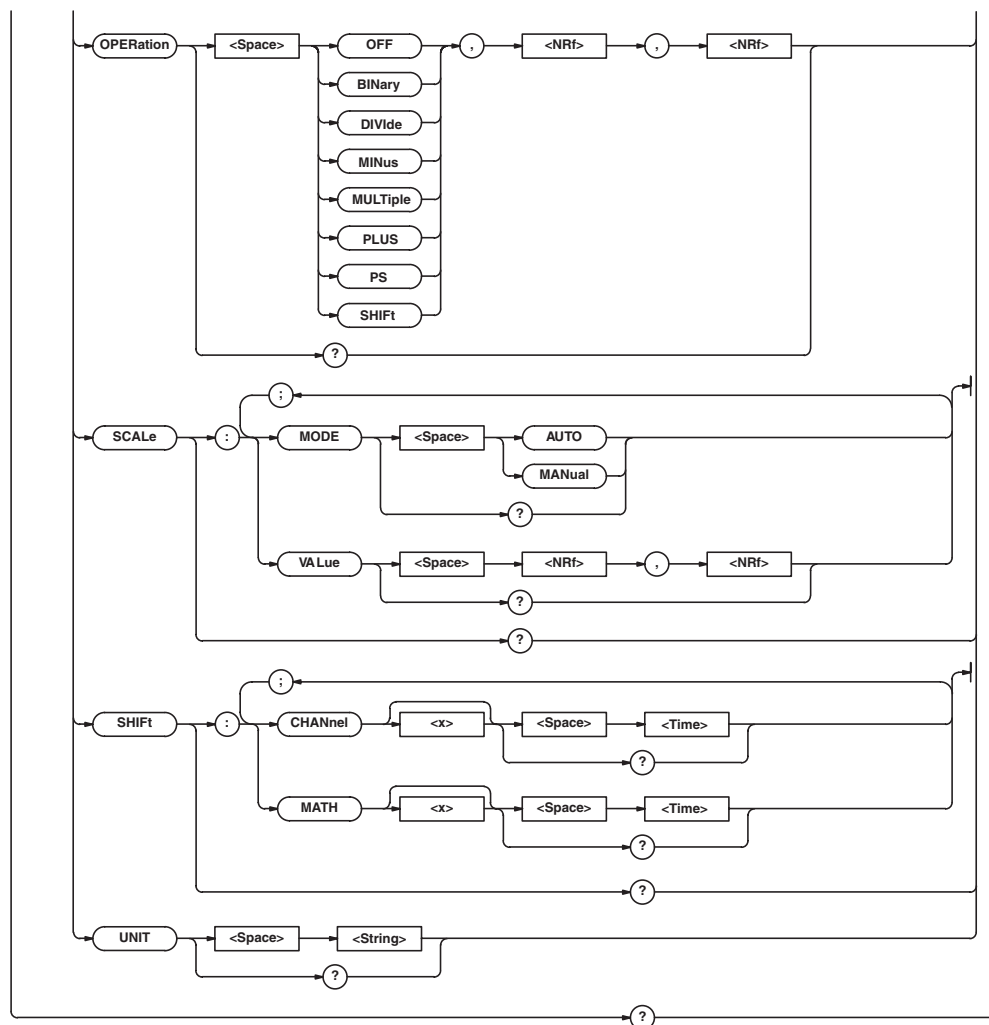
6.17 MATH Group

The commands in this group deal with computations. You can make the same settings and inquiries as when you press the MENU key > MATH soft key on the front panel.

When the time axis is set to a range indicated below, the selectable range varies depending on the record length setting. For details, see section 11.5, "Measuring Waveforms Using Cursors" in the *SL1400 User's Manual*.

<NRf>=-5 to 5div



**:MATH<x>?**

Function Queries all settings related to the computation.

Syntax :MATH<x>?

<x>=1 to 8

Example :MATH1? -> :MATH1:MODE 1;
 OPERATION PLUS;SCALE:MODE AUTO;
 VALUE 1.00000E+00,-1.00000E+00;:
 MATH1:UNIT "EU";
 LABEL "Math1";DISPLAY 1;
 DEFINE "D3+D6";FFT:POINTS 1000;
 WINDOW HANNING;:MATH1:
 MREFERENCE -5.0000000,5.0000000;
 AVERAGE:MODE OFF;TYPE TIME;
 COUNT 16;EWEIGHT 16;CCOUNT 720;:
 MATH1:FILTER1:TYPE GAUSS;
 BAND LPASS;CUTOFF1 10.0;
 CUTOFF2 10.0;:MATH1:FILTER2:
 TYPE GAUSS;BAND LPASS;CUTOFF1 10.0;
 CUTOFF2 10.0;:MATH1:
 CONSTANT1 1.00000E+00;
 CONSTANT2 1.00000E+00;
 CONSTANT3 1.00000E+00;
 CONSTANT4 1.00000E+00;
 CONSTANT5 1.00000E+00;
 CONSTANT6 1.00000E+00;
 CONSTANT7 1.00000E+00;
 CONSTANT8 1.00000E+00;SHIFT:
 CHANNEL1 5.000000000E-03;

CHANNEL2 0.0E+00;CHANNEL3 0.0E+00;
 CHANNEL4 0.0E+00;CHANNEL5 0.0E+00;
 CHANNEL6 0.0E+00;CHANNEL7 0.0E+00;
 CHANNEL8 0.0E+00;CHANNEL9 0.0E+00;
 CHANNEL10 0.0E+00;
 CHANNEL11 0.0E+00;
 CHANNEL12 0.0E+00;
 MATH2 0.0E+00;MATH3 0.0E+00;
 MATH4 0.0E+00;MATH5 0.0E+00;
 MATH6 0.0E+00;MATH7 0.0E+00;
 MATH8 0.0E+00;:MATH1:BINARY:
 CHANNEL1 0.0E+00,0.0E+00;
 CHANNEL2 0.0E+00,0.0E+00;
 CHANNEL3 0.0E+00,0.0E+00;
 CHANNEL4 0.0E+00,0.0E+00;
 CHANNEL5 0.0E+00,0.0E+00;
 CHANNEL6 0.0E+00,0.0E+00;
 CHANNEL7 0,0;CHANNEL8 0,0;
 CHANNEL9 0.0E+00,0.0E+00;
 CHANNEL10 0.0E+00,0.0E+00;
 CHANNEL11 0.0E+00,0.0E+00;
 CHANNEL12 0.0E+00,0.0E+00;
 MATH1 0.00,0.00;MATH2 0.00,0.00;
 MATH3 0.00,0.00;MATH4 0.00,0.00;
 MATH5 0.00,0.00;MATH6 0.00,0.00;
 MATH7 0.00,0.00;MATH8 0.00,0.00

6.17 MATH Group

:MATH<x>:BINARY?

Function Queries all settings related to the binary computation.

Syntax **:MATH<x>:BINARY?**
<x>=1 to 8

Example **:MATH1:Binary:CHANNEL1**
0.0E+00,0.0E+00;
CHANNEL2 0.0E+00,0.0E+00;
CHANNEL3 0.0E+00,0.0E+00;
CHANNEL4 0.0E+00,0.0E+00;
CHANNEL5 0.0E+00,0.0E+00;
CHANNEL6 0.0E+00,0.0E+00;
CHANNEL9 0.0E+00,0.0E+00;
CHANNEL10 0.0E+00,0.0E+00;
MATH1 0.00,0.00;MATH2 0.00,0.00;
MATH3 0.00,0.00;MATH4 0.00,0.00;
MATH5 0.00,0.00;MATH6 0.00,0.00;
MATH7 0.00,0.00;MATH8 0.00,0.00

:MATH<x>:BINARY:{CHANNEL<x>|MATH<x>}

Function Sets the threshold level of the binary computation channel or queries the current setting.

Syntax **:MATH<x>:BINARY:{CHANNEL<x>|MATH<x>}{<Voltage>,<Voltage>|<Current>,<Current>|<Nrf>,<Nrf>}**
<x>=1 to 8
<x> of CHANNEL<x>=1 to 16
<x> of MATH<x>=1 to 8
For CHANNEL<x>: Voltage, <Current>, <Nrf>=The selectable range varies depending on the range and offset settings. For details, see the *User's Manual*.
For MATH<x>: <Nrf>=-5 to 5 div (0.01 div steps)

Example **:MATH1:Binary:CHANNEL1 0V,0V**
:MATH1:Binary:CHANNEL1? -> :MATH1:Binary:CHANNEL1 0.0E+00,0.0E+00

:MATH<x>:DISPLAY

Function Sets whether to display computed waveforms or queries the current setting.

Syntax **:MATH<x>:DISPLAY {<Boolean>}**
:MATH<x>:DISPLAY?
<x>=1 to 8

Example **:MATH1:DISPLAY ON**
:MATH1:DISPLAY? -> :MATH1:DISPLAY 1

:MATH<x>:EShift:{CHANNEL<x>|MATH<x>}

Function Sets the phase offset of shift computation of the waveform measured with an external clock or queries the current setting.

Syntax **:MATH<x>:EShift:{CHANNEL<x>|MATH<x>}{<Nrf>}**
:MATH<x>:EShift:{CHANNEL<x>|MATH<x>}?
<x> of Math<x> = 1 to 7
<x> of CHANNEL<x> = 1 to 16

Example **:MATH1:EShift:CHANNEL1 1e2**
:MATH1:EShift:CHANNEL1? -> :MATH1:EShift:CHANNEL1 1e2

:MATH<x>:EXECute

Function Executes the computation.

Syntax **:MATH<x>:EXECute**
<x>=1 to 8

Example **:MATH1:EXECUTE**

:MATH<x>:FFT?

Function Queries all settings related to the FFT computation.

Syntax **:MATH<x>:FFT?**
<x>=1 to 8

Example **:MATH1:FFT? -> :MATH1:FFT:POINTS 1000;WINDOW HANNING**

:MATH<x>:FFT:POINT

Function Sets the number of points to be computed in the FFT computation or queries the current setting.

Syntax **:MATH<x>:FFT:POINT {<Nrf>}**
:MATH<x>:FFT:POINT?
<x>=1 to 8
<Nrf>=1000, 2000, 5000, 10000, 20000, 50000, 100000

Example **:MATH1:FFT:POINT 1000**
:MATH1:FFT:POINT? -> :MATH1:FFT:POINTS 1000

:MATH<x>:FFT:WINDOW

Function Sets the time window used in the FFT computation or queries the current setting.

Syntax **:MATH<x>:FFT:WINDOW**
{HANNing|RECTangle|FLATtop}
:MATH<x>:FFT:WINDOW?
<x>=1 to 8

Example **:MATH1:FFT:WINDOW HANNING**
:MATH1:FFT:WINDOW? -> :MATH1:FFT:WINDOW HANNING

:MATH<x>:LABEL

Function Sets the label of the computation or queries the current setting.

Syntax **:MATH<x>:LABEL {<String>}**
:MATH<x>:LABEL?
<x>=1 to 8
<String>=Up to 8 characters

Example **:MATH1:LABEL "MATH1"**
:MATH1:LABEL? -> :MATH1:LABEL "MATH1"

:MATH<x>:MODE

Function Turns ON/OFF the computation mode or queries the current setting.

Syntax **:MATH<x>:MODE {<Boolean>}**
:MATH<x>:MODE?
<x>=1 to 8

Example **:MATH1:MODE ON**
:MATH1:MODE? -> :MATH:MODE 1

:MATH<x>:MREference

Function Sets the computation range or queries the current setting.

Syntax **:MATH<x>:MREference {<Nrf>,<Nrf>}**
:MATH<x>:MREference?
<x>=1 to 8
<Nrf>=-5 to 5 divisions (10 divisions/record length steps)

Example **:MATH1:MREFERENCE -4,4**
:MATH1:MREFERENCE? -> :MATH1:MREFERENCE -4.0000000,4.0000000

:MATH<x>:OPERation

Function	Sets the computation details or queries the current setting.
Syntax	<code>:MATH<x>:OPERation {PLUS MINus MULTiple BINary DIVide SHIFt PS OFF}[,{<NRf> MATH<x>}[,{<NRf> MATH<x>}]]</code> <code>:MATH<x>:OPERation?</code> <code><x> of MATH<x>=1 to 8</code> <code><NRf>=1 to 16</code>
Example	<code>:MATH1:OPERATION PLUS,1,2</code> <code>:MATH1:OPERATION? -> :MATH1:OPERATION PLUS,1,2</code>
Description	- For unary operators (BINary SHIFt PS), select the target waveform using the first {<NRf> MATH<x>}. - For binary operators (PLUS MINus MULTiple DIVide), select the target waveform of the first term using the first {<NRf> MATH<x>} and the target waveform of the second term using the second <NRf>. - There is not target waveform selection for "OFF."

:MATH<x>:SCALE?

Function	Queries all settings related to scaling.
Syntax	<code>:MATH<x>:SCALE?</code> <code><x>=1 to 8</code>
Example	<code>:MATH1:SCALE? -> :MATH1:SCALE:MODE AUTO;VALUE 200.000E+00,0.0E+00</code>

:MATH<x>:SCALE:MODE

Function	Sets the scaling mode or queries the current setting.
Syntax	<code>:MATH<x>:SCALE:MODE {AUTO MANual}</code> <code>:MATH<x>:SCALE:MODE?</code> <code><x>=1 to 8</code>
Example	<code>:MATH1:SCALE:MODE AUTO</code> <code>:MATH1:SCALE:MODE? -></code> <code>:MATH1:SCALE:MODE AUTO</code>

:MATH<x>:SCALE:VALue

Function	Sets the upper and lower limits for manual scaling or queries the current setting.
Syntax	<code>:MATH<x>:SCALE:VALue {<NRf>,<NRf>}</code> <code>:MATH<x>:SCALE:VALue?</code> <code><x>=1 to 8</code> <code><NRf>=-9.9999E+30 to 9.9999E+30</code>
Example	<code>:MATH1:SCALE:VALUE 1,-1</code> <code>:MATH1:SCALE:VALUE? -></code> <code>:MATH1:SCALE:VALUE 1.00000E+00,-1.00000E+00</code>
Description	The larger of the two specified values is automatically set to the upper limit. This command is valid only during manual scaling.

:MATH<x>:SHIFt:{CHANnel<x>|MATH<x>}

Function	Sets the phase offset of shift computation of the waveform measured with an internal clock or queries the current setting.
Syntax	<code>:MATH<x>:SHIFt:{CHANnel<x> MATH<x>}{<Time>}</code> <code>:MATH<x>:SHIFt?</code> <code><x> of MATH<x>=1 to 7</code> <code><x> of CHANnel<x>=1 to 16</code> <code><Time>=500ns to 2592000s</code>
Example	<code>:MATH1:SHIFt:CHANNEL1 1e-3</code> <code>:MATH1:SHIFt:CHANNEL1? -></code> <code>:MATH1:SHIFt:CHANNEL1 1.000000000E-03</code>

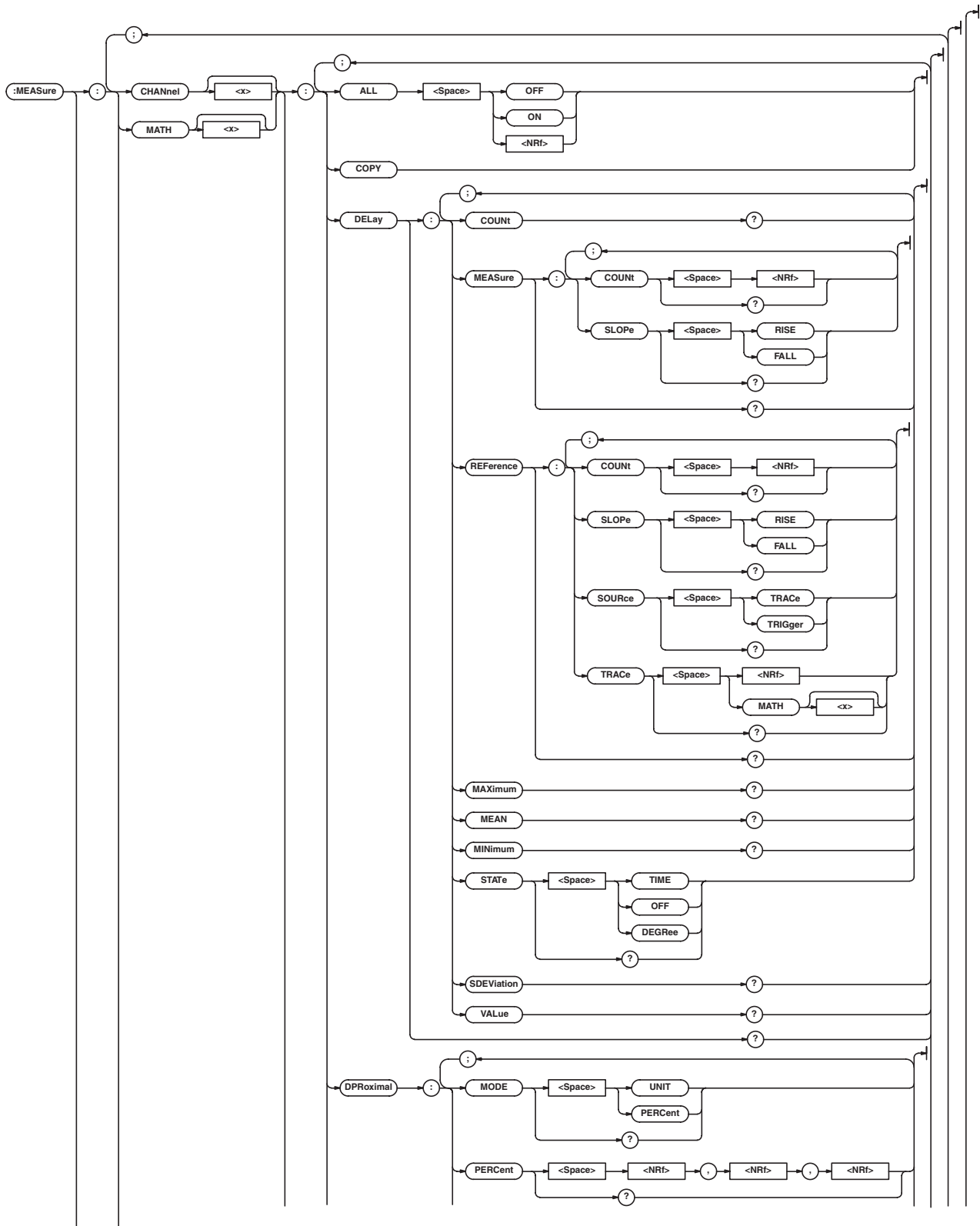
:MATH<x>:UNIT

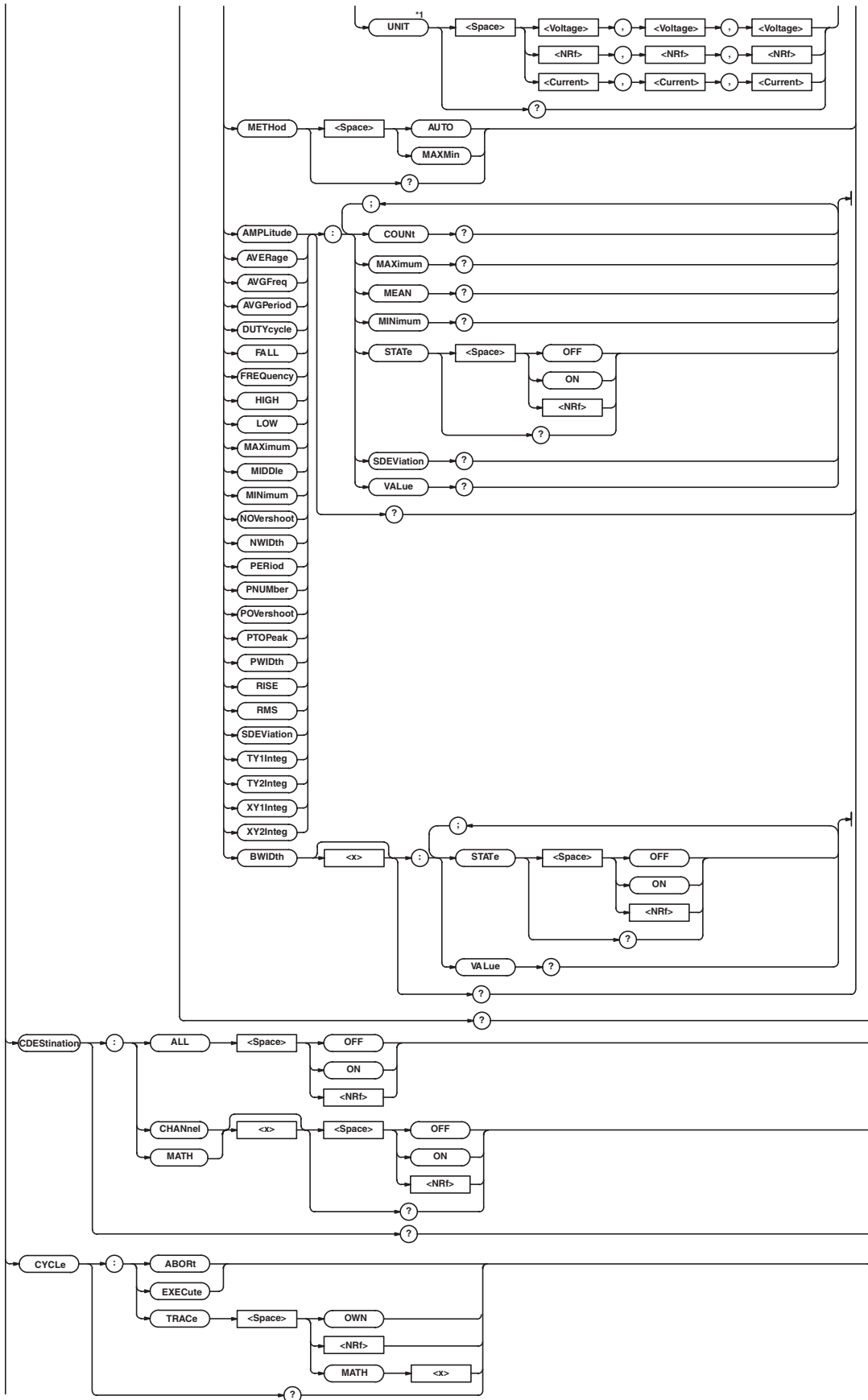
Function	Sets the unit to be added to the computed result or queries the current setting.
Syntax	<code>:MATH<x>:UNIT {<String>}</code> <code>:MATH<x>:UNIT?</code> <code><x>=1 to 8</code> <code><String>=Up to 4 characters</code>
Example	<code>:MATH1:UNIT "EU"</code> <code>:MATH1:UNIT? -> :MATH1:UNIT "EU"</code>
Description	The unit is applied to the scaled value. It does not affect computation results.

6.18 MEASure Group

The commands in this group deal with the automated measurement of waveform parameters. You can make the same settings and inquiries of settings and measured values as when the MEASURE key on the front panel is used. When the time axis is set to a range indicated below, the selectable range varies depending on the record length setting. For details, see section 11.5, "Measuring Waveforms Using Cursors" in the *SL1400 User's Manual*.

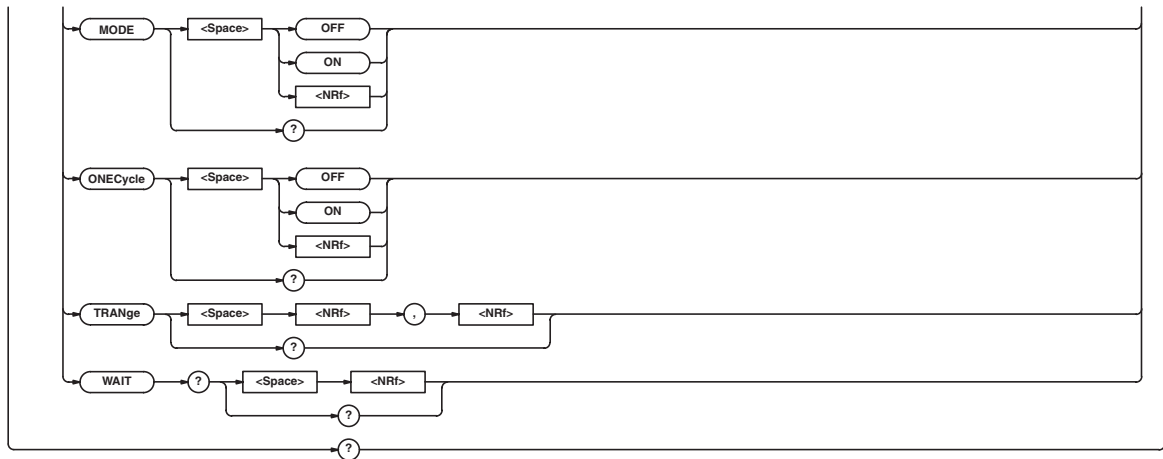
<NRf>=-5 to 5div





1 For :MEASure:MATH<x>, only <NRf> can be specified for the unit.

6.18 MEASure Group



:MEASure?

Function Queries all settings related to the automated measurement of waveform parameters.

Syntax :MEASure?

Example :MEASure? -> :MEASURE:MODE ON;
CHANNEL1:AMPLITUDE:STATE 0;;
MEASURE:CHANNEL1:AVERAGE:STATE 0;;
MEASURE:CHANNEL1:AVGFREQ:STATE 0;;
MEASURE:CHANNEL1:AVGPERIOD:STATE 0;;
MEASURE:CHANNEL1:BWIDTH1:STATE 0;;
MEASURE:CHANNEL1:BWIDTH2:STATE 0;;
MEASURE:CHANNEL1:DUTYCYCLE:STATE 0;;
MEASURE:CHANNEL1:FALL:STATE 0;;
MEASURE:CHANNEL1:FREQUENCY:STATE 0;;
MEASURE:CHANNEL1:HIGH:STATE 0;;
MEASURE:CHANNEL1:LOW:STATE 0;;
MEASURE:CHANNEL1:MAXIMUM:STATE 0;;
MEASURE:CHANNEL1:MIDDLE:STATE 0;;
MEASURE:CHANNEL1:MINIMUM:STATE 0;;
MEASURE:CHANNEL1:NOVERSHOOT:
STATE 0;;MEASURE:CHANNEL1:NWIDTH:
STATE 0;;MEASURE:CHANNEL1:PERIOD:
STATE 0;;MEASURE:CHANNEL1:PNUMBER:
STATE 0;;MEASURE:CHANNEL1:
POVERSHOOT:STATE 0;;MEASURE:
CHANNEL1:PTOPEAK:STATE 0;;MEASURE:
CHANNEL1:PWIDTH:STATE 0;;MEASURE:
CHANNEL1:RISE:STATE 0;;MEASURE:
CHANNEL1:RMS:STATE 0;;MEASURE:
CHANNEL1:SDEVIATION:STATE 0;;
MEASURE:CHANNEL1:TY1INTEG:STATE 0;;
MEASURE:CHANNEL1:TY2INTEG:STATE 0;;
MEASURE:CHANNEL1:XY1INTEG:STATE 0;;
MEASURE:CHANNEL1:XY2INTEG:STATE 0;;
MEASURE:CHANNEL1:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;MEASURE:
CHANNEL1:DELAY:REFERENCE:
SOURCE TRACE;TRACE 1;SLOPE RISE;
COUNT 1;MEASURE:CHANNEL1:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00;MEASURE:CHANNEL1:
METHOD AUTO;MEASURE:CHANNEL2:
AMPLITUDE:STATE 0;;MEASURE:CHANNEL2:
AVERAGE:STATE 0;;MEASURE:CHANNEL2:
AVGFREQ:STATE 0;;MEASURE:CHANNEL2:
AVGPERIOD:STATE 0;;MEASURE:CHANNEL2:
BWIDTH1:STATE 0;;MEASURE:CHANNEL2:
BWIDTH2:STATE 0;;MEASURE:CHANNEL2:
DUTYCYCLE:STATE 0;;MEASURE:CHANNEL2:
FALL:STATE 0;;MEASURE:CHANNEL2:
FREQUENCY:STATE 0;;MEASURE:CHANNEL2:
HIGH:STATE 0;;MEASURE:CHANNEL2:LOW:
STATE 0;;MEASURE:CHANNEL2:MAXIMUM:
STATE 0;;MEASURE:CHANNEL2:MIDDLE:
STATE 0;;MEASURE:CHANNEL2:MINIMUM:
STATE 0;;MEASURE:CHANNEL2:
NOVERSHOOT:STATE 0;;MEASURE:
CHANNEL2:NWIDTH:STATE 0;;MEASURE:
CHANNEL2:PERIOD:STATE 0;;MEASURE:
CHANNEL2:PNUMBER:STATE 0;;MEASURE:
CHANNEL2:POVERSHOOT:STATE 0;;
MEASURE:CHANNEL2:PTOPEAK:STATE 0;;
MEASURE:CHANNEL2:PWIDTH:STATE 0;;
MEASURE:CHANNEL2:RISE:STATE 0;;
MEASURE:CHANNEL2:RMS:STATE 0;;
MEASURE:CHANNEL2:SDEVIATION:
STATE 0;;MEASURE:CHANNEL2:TY1INTEG:
STATE 0;;MEASURE:CHANNEL2:TY2INTEG:
STATE 0;;MEASURE:CHANNEL2:XY1INTEG:
STATE 0;;MEASURE:CHANNEL2:XY2INTEG:
STATE 0;;MEASURE:CHANNEL2:DELAY:
STATE OFF;MEASURE:SLOPE RISE;
COUNT 1;MEASURE:CHANNEL2:DELAY:
REFERENCE:SOURCE TRACE;TRACE 2;
SLOPE RISE;COUNT 1;MEASURE:
CHANNEL2:DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00;MEASURE:CHANNEL2:
METHOD AUTO;MEASURE:CHANNEL3:
AMPLITUDE:STATE 0;;MEASURE:CHANNEL3:
AVERAGE:STATE 0;;MEASURE:CHANNEL3:
AVGFREQ:STATE 0;;MEASURE:CHANNEL3:
AVGPERIOD:STATE 0;;MEASURE:CHANNEL3:
BWIDTH1:STATE 0;;MEASURE:CHANNEL3:
BWIDTH2:STATE 0;;MEASURE:CHANNEL3:
DUTYCYCLE:STATE 0;;MEASURE:CHANNEL3:
FALL:STATE 0;;MEASURE:CHANNEL3:
FREQUENCY:STATE 0;;MEASURE:CHANNEL3:
HIGH:STATE 0;;MEASURE:CHANNEL3:LOW:
STATE 0;;MEASURE:CHANNEL3:MAXIMUM:
STATE 0;;MEASURE:CHANNEL3:MIDDLE:
STATE 0;;MEASURE:CHANNEL3:MINIMUM:
STATE 0;;MEASURE:CHANNEL3:
NOVERSHOOT:STATE 0;;MEASURE:
CHANNEL3:NWIDTH:STATE 0;;MEASURE:

BWIDTH2:STATE 0;;MEASURE:CHANNEL2:
DUTYCYCLE:STATE 0;;MEASURE:CHANNEL2:
FALL:STATE 0;;MEASURE:CHANNEL2:
FREQUENCY:STATE 0;;MEASURE:CHANNEL2:
HIGH:STATE 0;;MEASURE:CHANNEL2:LOW:
STATE 0;;MEASURE:CHANNEL2:MAXIMUM:
STATE 0;;MEASURE:CHANNEL2:MIDDLE:
STATE 0;;MEASURE:CHANNEL2:MINIMUM:
STATE 0;;MEASURE:CHANNEL2:
NOVERSHOOT:STATE 0;;MEASURE:
CHANNEL2:NWIDTH:STATE 0;;MEASURE:
CHANNEL2:PERIOD:STATE 0;;MEASURE:
CHANNEL2:PNUMBER:STATE 0;;MEASURE:
CHANNEL2:POVERSHOOT:STATE 0;;
MEASURE:CHANNEL2:PTOPEAK:STATE 0;;
MEASURE:CHANNEL2:PWIDTH:STATE 0;;
MEASURE:CHANNEL2:RISE:STATE 0;;
MEASURE:CHANNEL2:RMS:STATE 0;;
MEASURE:CHANNEL2:SDEVIATION:
STATE 0;;MEASURE:CHANNEL2:TY1INTEG:
STATE 0;;MEASURE:CHANNEL2:TY2INTEG:
STATE 0;;MEASURE:CHANNEL2:XY1INTEG:
STATE 0;;MEASURE:CHANNEL2:XY2INTEG:
STATE 0;;MEASURE:CHANNEL2:DELAY:
STATE OFF;MEASURE:SLOPE RISE;
COUNT 1;MEASURE:CHANNEL2:DELAY:
REFERENCE:SOURCE TRACE;TRACE 2;
SLOPE RISE;COUNT 1;MEASURE:
CHANNEL2:DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00;MEASURE:CHANNEL2:
METHOD AUTO;MEASURE:CHANNEL3:
AMPLITUDE:STATE 0;;MEASURE:CHANNEL3:
AVERAGE:STATE 0;;MEASURE:CHANNEL3:
AVGFREQ:STATE 0;;MEASURE:CHANNEL3:
AVGPERIOD:STATE 0;;MEASURE:CHANNEL3:
BWIDTH1:STATE 0;;MEASURE:CHANNEL3:
BWIDTH2:STATE 0;;MEASURE:CHANNEL3:
DUTYCYCLE:STATE 0;;MEASURE:CHANNEL3:
FALL:STATE 0;;MEASURE:CHANNEL3:
FREQUENCY:STATE 0;;MEASURE:CHANNEL3:
HIGH:STATE 0;;MEASURE:CHANNEL3:LOW:
STATE 0;;MEASURE:CHANNEL3:MAXIMUM:
STATE 0;;MEASURE:CHANNEL3:MIDDLE:
STATE 0;;MEASURE:CHANNEL3:MINIMUM:
STATE 0;;MEASURE:CHANNEL3:
NOVERSHOOT:STATE 0;;MEASURE:
CHANNEL3:NWIDTH:STATE 0;;MEASURE:

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CHANNEL3:PERIOD:STATE 0;:MEASURE:
CHANNEL3:PNUMBER:STATE 0;:MEASURE:
CHANNEL3:POVERSHOOT:STATE 0;:
MEASURE:CHANNEL3:PTOPEAK:STATE 0;:
MEASURE:CHANNEL3:PWIDTH:STATE 0;:
MEASURE:CHANNEL3:RISE:STATE 0;:
MEASURE:CHANNEL3:RMS:STATE 0;:
MEASURE:CHANNEL3:SDEVIATION:
STATE 0;:MEASURE:CHANNEL3:TY1INTEG:
STATE 0;:MEASURE:CHANNEL3:TY2INTEG:
STATE 0;:MEASURE:CHANNEL3:XY1INTEG:
STATE 0;:MEASURE:CHANNEL3:XY2INTEG:
STATE 0;:MEASURE:CHANNEL3:DELAY:
STATE OFF;MEASURE:SLOPE RISE;
COUNT 1;:MEASURE:CHANNEL3:DELAY:
REFERENCE:SOURCE TRACE;TRACE 3;
SLOPE RISE;COUNT 1;:MEASURE:
CHANNEL3:DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00;:MEASURE:CHANNEL3:
METHOD AUTO;:MEASURE:CHANNEL4:
AMPLITUDE:STATE 0;:MEASURE:CHANNEL4:
AVERAGE:STATE 0;:MEASURE:CHANNEL4:
AVGFREQ:STATE 0;:MEASURE:CHANNEL4:
AVGPERIOD:STATE 0;:MEASURE:CHANNEL4:
BWIDTH1:STATE 0;:MEASURE:CHANNEL4:
BWIDTH2:STATE 0;:MEASURE:CHANNEL4:
DUTYCYCLE:STATE 0;:MEASURE:CHANNEL4:
FALL:STATE 0;:MEASURE:CHANNEL4:
FREQUENCY:STATE 0;:MEASURE:CHANNEL4:
HIGH:STATE 0;:MEASURE:CHANNEL4:LOW:
STATE 0;:MEASURE:CHANNEL4:MAXIMUM:
STATE 0;:MEASURE:CHANNEL4:MIDDLE:
STATE 0;:MEASURE:CHANNEL4:MINIMUM:
STATE 0;:MEASURE:CHANNEL4:
NOVERSHOOT:STATE 0;:MEASURE:
CHANNEL4:NWIDTH:STATE 0;:MEASURE:
CHANNEL4:PERIOD:STATE 0;:MEASURE:
CHANNEL4:PNUMBER:STATE 0;:MEASURE:
CHANNEL4:POVERSHOOT:STATE 0;:
MEASURE:CHANNEL4:PTOPEAK:STATE 0;:
MEASURE:CHANNEL4:PWIDTH:STATE 0;:
MEASURE:CHANNEL4:RISE:STATE 0;:
MEASURE:CHANNEL4:RMS:STATE 0;:
MEASURE:CHANNEL4:SDEVIATION:
STATE 0;:MEASURE:CHANNEL4:TY1INTEG:
STATE 0;:MEASURE:CHANNEL4:TY2INTEG:
STATE 0;:MEASURE:CHANNEL4:XY1INTEG:
STATE 0;:MEASURE:CHANNEL4:XY2INTEG:
STATE 0;:MEASURE:CHANNEL4:DELAY:
STATE OFF;MEASURE:SLOPE RISE;
COUNT 1;:MEASURE:CHANNEL4:DELAY:
REFERENCE:SOURCE TRACE;TRACE 4;
SLOPE RISE;COUNT 1;:MEASURE:
CHANNEL4:DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00;:MEASURE:CHANNEL4:
METHOD AUTO;:MEASURE:CHANNEL5:
AMPLITUDE:STATE 0;:MEASURE:CHANNEL5:
AVERAGE:STATE 0;:MEASURE:CHANNEL5:
AVGFREQ:STATE 0;:MEASURE:CHANNEL5:
AVGPERIOD:STATE 0;:MEASURE:CHANNEL5:
BWIDTH1:STATE 0;:MEASURE:CHANNEL5:
BWIDTH2:STATE 0;:MEASURE:CHANNEL5:
DUTYCYCLE:STATE 0;:MEASURE:CHANNEL5:
FALL:STATE 0;:MEASURE:CHANNEL5:
FREQUENCY:STATE 0;:MEASURE:CHANNEL5:

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HIGH:STATE 0;:MEASURE:CHANNEL5:LOW:
STATE 0;:MEASURE:CHANNEL5:MAXIMUM:
STATE 0;:MEASURE:CHANNEL5:MIDDLE:
STATE 0;:MEASURE:CHANNEL5:MINIMUM:
STATE 0;:MEASURE:CHANNEL5:
NOVERSHOOT:STATE 0;:MEASURE:
CHANNEL5:NWIDTH:STATE 0;:MEASURE:
CHANNEL5:PERIOD:STATE 0;:MEASURE:
CHANNEL5:PNUMBER:STATE 0;:MEASURE:
CHANNEL5:POVERSHOOT:STATE 0;:
MEASURE:CHANNEL5:PTOPEAK:STATE 0;:
MEASURE:CHANNEL5:PWIDTH:STATE 0;:
MEASURE:CHANNEL5:RISE:STATE 0;:
MEASURE:CHANNEL5:RMS:STATE 0;:
MEASURE:CHANNEL5:SDEVIATION:
STATE 0;:MEASURE:CHANNEL5:TY1INTEG:
STATE 0;:MEASURE:CHANNEL5:TY2INTEG:
STATE 0;:MEASURE:CHANNEL5:XY1INTEG:
STATE 0;:MEASURE:CHANNEL5:XY2INTEG:
STATE 0;:MEASURE:CHANNEL5:DELAY:
STATE OFF;MEASURE:SLOPE RISE;
COUNT 1;:MEASURE:CHANNEL5:DELAY:
REFERENCE:SOURCE TRACE;TRACE 5;
SLOPE RISE;COUNT 1;:MEASURE:
CHANNEL5:DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00;:MEASURE:CHANNEL5:
METHOD AUTO;:MEASURE:CHANNEL6:
AMPLITUDE:STATE 0;:MEASURE:CHANNEL6:
AVERAGE:STATE 0;:MEASURE:CHANNEL6:
AVGFREQ:STATE 0;:MEASURE:CHANNEL6:
AVGPERIOD:STATE 0;:MEASURE:CHANNEL6:
BWIDTH1:STATE 0;:MEASURE:CHANNEL6:
BWIDTH2:STATE 0;:MEASURE:CHANNEL6:
DUTYCYCLE:STATE 0;:MEASURE:CHANNEL6:
FALL:STATE 0;:MEASURE:CHANNEL6:
FREQUENCY:STATE 0;:MEASURE:CHANNEL6:
HIGH:STATE 0;:MEASURE:CHANNEL6:LOW:
STATE 0;:MEASURE:CHANNEL6:MAXIMUM:
STATE 0;:MEASURE:CHANNEL6:MIDDLE:
STATE 0;:MEASURE:CHANNEL6:MINIMUM:
STATE 0;:MEASURE:CHANNEL6:
NOVERSHOOT:STATE 0;:MEASURE:
CHANNEL6:NWIDTH:STATE 0;:MEASURE:
CHANNEL6:PERIOD:STATE 0;:MEASURE:
CHANNEL6:PNUMBER:STATE 0;:MEASURE:
CHANNEL6:POVERSHOOT:STATE 0;:
MEASURE:CHANNEL6:PTOPEAK:STATE 0;:
MEASURE:CHANNEL6:PWIDTH:STATE 0;:
MEASURE:CHANNEL6:RISE:STATE 0;:
MEASURE:CHANNEL6:RMS:STATE 0;:
MEASURE:CHANNEL6:SDEVIATION:STATE 0;:
MEASURE:CHANNEL6:TY1INTEG:
STATE 0;:MEASURE:CHANNEL6:TY2INTEG:
STATE 0;:MEASURE:CHANNEL6:XY1INTEG:
STATE 0;:MEASURE:CHANNEL6:XY2INTEG:
STATE 0;:MEASURE:CHANNEL6:DELAY:
STATE OFF;MEASURE:SLOPE RISE;
COUNT 1;:MEASURE:CHANNEL6:DELAY:
REFERENCE:SOURCE TRACE;TRACE 6;
SLOPE RISE;COUNT 1;:MEASURE:
CHANNEL6:DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00;:MEASURE:CHANNEL6:
METHOD AUTO;:MEASURE:CHANNEL7:
AMPLITUDE:STATE 0;:MEASURE:CHANNEL7:
AVERAGE:STATE 0;:MEASURE:CHANNEL7:

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6.18 MEASure Group

AVGFREQ:STATE 0;;MEASURE:CHANNEL7:
AVGPERIOD:STATE 0;;MEASURE:CHANNEL7:
BWIDTH1:STATE 0;;MEASURE:CHANNEL7:
BWIDTH2:STATE 0;;MEASURE:CHANNEL7:
DUTYCYCLE:STATE 0;;MEASURE:CHANNEL7:
FALL:STATE 0;;MEASURE:CHANNEL7:
FREQUENCY:STATE 0;;MEASURE:CHANNEL7:
HIGH:STATE 0;;MEASURE:CHANNEL7:LOW:
STATE 0;;MEASURE:CHANNEL7:MAXIMUM:
STATE 0;;MEASURE:CHANNEL7:MIDDLE:
STATE 0;;MEASURE:CHANNEL7:MINIMUM:
STATE 0;;MEASURE:CHANNEL7:
NOVERSHOOT:STATE 0;;MEASURE:
CHANNEL7:NWIDTH:STATE 0;;MEASURE:
CHANNEL7:PERIOD:STATE 0;;MEASURE:
CHANNEL7:PNUMBER:STATE 0;;MEASURE:
CHANNEL7:POVERSHOOT:STATE 0;;
MEASURE:CHANNEL7:PTOPEAK:STATE 0;;
MEASURE:CHANNEL7:PWIDTH:STATE 0;;
MEASURE:CHANNEL7:RISE:STATE 0;;
MEASURE:CHANNEL7:RMS:STATE 0;;
MEASURE:CHANNEL7:SDEVIATION:
STATE 0;;MEASURE:CHANNEL7:TY1INTEG:
STATE 0;;MEASURE:CHANNEL7:TY2INTEG:
STATE 0;;MEASURE:CHANNEL7:XY1INTEG:
STATE 0;;MEASURE:CHANNEL7:XY2INTEG:
STATE 0;;MEASURE:CHANNEL7:DELAY:
STATE OFF;MEASURE:SLOPE RISE;
COUNT 1;;MEASURE:CHANNEL7:DELAY:
REFERENCE:SOURCE TRACE;TRACE 7;
SLOPE RISE;COUNT 1;;MEASURE:
CHANNEL7:DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -20000,0,20000;;MEASURE:
CHANNEL7:METHOD AUTO;;MEASURE:
CHANNEL8:AMPLITUDE:STATE 0;;MEASURE:
CHANNEL8:AVERAGE:STATE 0;;MEASURE:
CHANNEL8:AVGFREQ:STATE 0;;MEASURE:
CHANNEL8:AVGPERIOD:STATE 0;;MEASURE:
CHANNEL8:BWIDTH1:STATE 0;;MEASURE:
CHANNEL8:BWIDTH2:STATE 0;;MEASURE:
CHANNEL8:DUTYCYCLE:STATE 0;;MEASURE:
CHANNEL8:FALL:STATE 0;;MEASURE:
CHANNEL8:FREQUENCY:STATE 0;;MEASURE:
CHANNEL8:HIGH:STATE 0;;MEASURE:
CHANNEL8:LOW:STATE 0;;MEASURE:
CHANNEL8:MAXIMUM:STATE 0;;MEASURE:
CHANNEL8:MIDDLE:STATE 0;;MEASURE:
CHANNEL8:MINIMUM:STATE 0;;MEASURE:
CHANNEL8:NOVERSHOOT:STATE 0;;
MEASURE:CHANNEL8:NWIDTH:STATE 0;;
MEASURE:CHANNEL8:PERIOD:STATE 0;;
MEASURE:CHANNEL8:PNUMBER:STATE 0;;
MEASURE:CHANNEL8:POVERSHOOT:
STATE 0;;MEASURE:CHANNEL8:PTOPEAK:
STATE 0;;MEASURE:CHANNEL8:PWIDTH:
STATE 0;;MEASURE:CHANNEL8:RISE:
STATE 0;;MEASURE:CHANNEL8:RMS:
STATE 0;;MEASURE:CHANNEL8:
SDEVIATION:STATE 0;;MEASURE:
CHANNEL8:TY1INTEG:STATE 0;;MEASURE:
CHANNEL8:TY2INTEG:STATE 0;;MEASURE:
CHANNEL8:XY1INTEG:STATE 0;;MEASURE:
CHANNEL8:XY2INTEG:STATE 0;;MEASURE:
CHANNEL8:DELAY:STATE OFF;MEASURE:
SLOPE RISE;COUNT 1;;MEASURE:
CHANNEL8:DELAY:REFERENCE:
SOURCE TRACE;TRACE 8;SLOPE RISE;
COUNT 1;;MEASURE:CHANNEL8:

DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -20000,0,20000;;MEASURE:
CHANNEL8:METHOD AUTO;;MEASURE:
CHANNEL9:AMPLITUDE:STATE 0;;MEASURE:
CHANNEL9:AVERAGE:STATE 0;;MEASURE:
CHANNEL9:AVGFREQ:STATE 0;;MEASURE:
CHANNEL9:AVGPERIOD:STATE 0;;MEASURE:
CHANNEL9:BWIDTH1:STATE 0;;MEASURE:
CHANNEL9:BWIDTH2:STATE 0;;MEASURE:
CHANNEL9:DUTYCYCLE:STATE 0;;MEASURE:
CHANNEL9:FALL:STATE 0;;MEASURE:
CHANNEL9:FREQUENCY:STATE 0;;MEASURE:
CHANNEL9:HIGH:STATE 0;;MEASURE:
CHANNEL9:LOW:STATE 0;;MEASURE:
CHANNEL9:MAXIMUM:STATE 0;;MEASURE:
CHANNEL9:MIDDLE:STATE 0;;MEASURE:
CHANNEL9:MINIMUM:STATE 0;;MEASURE:
CHANNEL9:NOVERSHOOT:STATE 0;;
MEASURE:CHANNEL9:NWIDTH:STATE 0;;
MEASURE:CHANNEL9:PERIOD:STATE 0;;
MEASURE:CHANNEL9:PNUMBER:STATE 0;;
MEASURE:CHANNEL9:POVERSHOOT:
STATE 0;;MEASURE:CHANNEL9:PTOPEAK:
STATE 0;;MEASURE:CHANNEL9:PWIDTH:
STATE 0;;MEASURE:CHANNEL9:RISE:
STATE 0;;MEASURE:CHANNEL9:RMS:
STATE 0;;MEASURE:CHANNEL9:
SDEVIATION:STATE 0;;MEASURE:
CHANNEL9:TY1INTEG:STATE 0;;MEASURE:
CHANNEL9:TY2INTEG:STATE 0;;MEASURE:
CHANNEL9:XY1INTEG:STATE 0;;MEASURE:
CHANNEL9:XY2INTEG:STATE 0;;MEASURE:
CHANNEL9:DELAY:STATE OFF;MEASURE:
SLOPE RISE;COUNT 1;;MEASURE:
CHANNEL9:DELAY:REFERENCE:
SOURCE TRACE;TRACE 9;SLOPE RISE;
COUNT 1;;MEASURE:CHANNEL9:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -15.000E+00,0.0E+00,
15.000E+00;;MEASURE:CHANNEL9:
METHOD AUTO;;MEASURE:CHANNEL10:
AMPLITUDE:STATE 0;;MEASURE:
CHANNEL10:AVERAGE:STATE 0;;MEASURE:
CHANNEL10:AVGFREQ:STATE 0;;MEASURE:
CHANNEL10:AVGPERIOD:STATE 0;;
MEASURE:CHANNEL10:BWIDTH1:STATE 0;;
MEASURE:CHANNEL10:BWIDTH2:STATE 0;;
MEASURE:CHANNEL10:DUTYCYCLE:
STATE 0;;MEASURE:CHANNEL10:FALL:
STATE 0;;MEASURE:CHANNEL10:
FREQUENCY:STATE 0;;MEASURE:
CHANNEL10:HIGH:STATE 0;;MEASURE:
CHANNEL10:LOW:STATE 0;;MEASURE:
CHANNEL10:MAXIMUM:STATE 0;;MEASURE:
CHANNEL10:MIDDLE:STATE 0;;MEASURE:
CHANNEL10:MINIMUM:STATE 0;;MEASURE:
CHANNEL10:NOVERSHOOT:STATE 0;;
MEASURE:CHANNEL10:NWIDTH:STATE 0;;
MEASURE:CHANNEL10:PERIOD:STATE 0;;
MEASURE:CHANNEL10:PNUMBER:STATE 0;;
MEASURE:CHANNEL10:POVERSHOOT:
STATE 0;;MEASURE:CHANNEL10:PTOPEAK:
STATE 0;;MEASURE:CHANNEL10:PWIDTH:
STATE 0;;MEASURE:CHANNEL10:RISE:
STATE 0;;MEASURE:CHANNEL10:RMS:
STATE 0;;MEASURE:CHANNEL10:
SDEVIATION:STATE 0;;MEASURE:
CHANNEL10:TY1INTEG:STATE 0;;MEASURE:


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CHANNEL10:TY2INTEG:STATE 0;:MEASURE:
CHANNEL10:XY1INTEG:STATE 0;:MEASURE:
CHANNEL10:XY2INTEG:STATE 0;:MEASURE:
CHANNEL10:DELAY:STATE OFF;MEASURE:
SLOPE RISE;COUNT 1;:MEASURE:
CHANNEL10:DELAY:REFERENCE:
SOURCE TRACE;TRACE 10;SLOPE RISE;
COUNT 1;:MEASURE:CHANNEL10:
DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -15.000E+00,0.0E+00,
15.000E+00;:MEASURE:CHANNEL10:
METHOD AUTO;:MEASURE:CHANNEL11:
AMPLITUDE:STATE 0;:MEASURE:
CHANNEL11:AVERAGE:STATE 0;:MEASURE:
CHANNEL11:AVGFREQ:STATE 0;:MEASURE:
CHANNEL11:AVGPERIOD:STATE 0;:
MEASURE:CHANNEL11:BWIDTH1:STATE 0;:
MEASURE:CHANNEL11:BWIDTH2:STATE 0;:
MEASURE:CHANNEL11:DUTYCYCLE:
STATE 0;:MEASURE:CHANNEL11:FALL:
STATE 0;:MEASURE:CHANNEL11:
FREQUENCY:STATE 0;:MEASURE:
CHANNEL11:HIGH:STATE 0;:MEASURE:
CHANNEL11:LOW:STATE 0;:MEASURE:
CHANNEL11:MAXIMUM:STATE 0;:MEASURE:
CHANNEL11:MIDDLE:STATE 0;:MEASURE:
CHANNEL11:MINIMUM:STATE 0;:MEASURE:
CHANNEL11:NOVERSHOOT:STATE 0;:
MEASURE:CHANNEL11:NWIDTH:STATE 0;:
MEASURE:CHANNEL11:PERIOD:STATE 0;:
MEASURE:CHANNEL11:PNUMBER:STATE 0;:
MEASURE:CHANNEL11:POVERSHOOT:
STATE 0;:MEASURE:CHANNEL11:PTOPEAK:
STATE 0;:MEASURE:CHANNEL11:PWIDTH:
STATE 0;:MEASURE:CHANNEL11:RISE:
STATE 0;:MEASURE:CHANNEL11:RMS:
STATE 0;:MEASURE:CHANNEL11:
SDEVIATION:STATE 0;:MEASURE:
CHANNEL11:TY1INTEG:STATE 0;:MEASURE:
CHANNEL11:TY2INTEG:STATE 0;:MEASURE:
CHANNEL11:XY1INTEG:STATE 0;:MEASURE:
CHANNEL11:XY2INTEG:STATE 0;:MEASURE:
CHANNEL11:DELAY:STATE OFF;MEASURE:
SLOPE RISE;COUNT 1;:MEASURE:
CHANNEL11:DELAY:REFERENCE:
SOURCE TRACE;TRACE 11;SLOPE RISE;
COUNT 1;:MEASURE:CHANNEL11:
DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -15.000E+00,0.0E+00,
15.000E+00;:MEASURE:CHANNEL11:
METHOD AUTO;:MEASURE:CHANNEL12:
AMPLITUDE:STATE 0;:MEASURE:
CHANNEL12:AVERAGE:STATE 0;:MEASURE:
CHANNEL12:AVGFREQ:STATE 0;:MEASURE:
CHANNEL12:AVGPERIOD:STATE 0;:
MEASURE:CHANNEL12:BWIDTH1:STATE 0;:
MEASURE:CHANNEL12:BWIDTH2:STATE 0;:
MEASURE:CHANNEL12:DUTYCYCLE:
STATE 0;:MEASURE:CHANNEL12:FALL:
STATE 0;:MEASURE:CHANNEL12:
FREQUENCY:STATE 0;:MEASURE:
CHANNEL12:HIGH:STATE 0;:MEASURE:
CHANNEL12:LOW:STATE 0;:MEASURE:
CHANNEL12:MAXIMUM:STATE 0;:MEASURE:
CHANNEL12:MIDDLE:STATE 0;:MEASURE:
CHANNEL12:MINIMUM:STATE 0;:MEASURE:
CHANNEL12:NOVERSHOOT:STATE 0;:

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MEASURE:CHANNEL12:NWIDTH:STATE 0;:
MEASURE:CHANNEL12:PERIOD:STATE 0;:
MEASURE:CHANNEL12:PNUMBER:STATE 0;:
MEASURE:CHANNEL12:POVERSHOOT:
STATE 0;:MEASURE:CHANNEL12:PTOPEAK:
STATE 0;:MEASURE:CHANNEL12:PWIDTH:
STATE 0;:MEASURE:CHANNEL12:RISE:
STATE 0;:MEASURE:CHANNEL12:RMS:
STATE 0;:MEASURE:CHANNEL12:
SDEVIATION:STATE 0;:MEASURE:
CHANNEL12:TY1INTEG:STATE 0;:MEASURE:
CHANNEL12:TY2INTEG:STATE 0;:MEASURE:
CHANNEL12:XY1INTEG:STATE 0;:MEASURE:
CHANNEL12:XY2INTEG:STATE 0;:MEASURE:
CHANNEL12:DELAY:STATE OFF;MEASURE:
SLOPE RISE;COUNT 1;:MEASURE:
CHANNEL12:DELAY:REFERENCE:
SOURCE TRACE;TRACE 12;SLOPE RISE;
COUNT 1;:MEASURE:CHANNEL12:
DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -15.000E+00,0.0E+00,
15.000E+00;:MEASURE:CHANNEL12:
METHOD AUTO;:MEASURE:MATH1:
AMPLITUDE:STATE 0;:MEASURE:MATH1:
AVERAGE:STATE 0;:MEASURE:MATH1:
AVGFREQ:STATE 0;:MEASURE:MATH1:
AVGPERIOD:STATE 0;:MEASURE:MATH1:
BWIDTH1:STATE 0;:MEASURE:MATH1:
BWIDTH2:STATE 0;:MEASURE:MATH1:
DUTYCYCLE:STATE 0;:MEASURE:MATH1:
FALL:STATE 0;:MEASURE:MATH1:
FREQUENCY:STATE 0;:MEASURE:MATH1:
HIGH:STATE 0;:MEASURE:MATH1:LOW:
STATE 0;:MEASURE:MATH1:MAXIMUM:
STATE 0;:MEASURE:MATH1:MIDDLE:
STATE 0;:MEASURE:MATH1:MINIMUM:
STATE 0;:MEASURE:MATH1:NOVERSHOOT:
STATE 0;:MEASURE:MATH1:NWIDTH:
STATE 0;:MEASURE:MATH1:PERIOD:
STATE 0;:MEASURE:MATH1:PNUMBER:
STATE 0;:MEASURE:MATH1:POVERSHOOT:
STATE 0;:MEASURE:MATH1:PTOPEAK:
STATE 0;:MEASURE:MATH1:PWIDTH:
STATE 0;:MEASURE:MATH1:RISE:
STATE 0;:MEASURE:MATH1:RMS:STATE 0;:
MEASURE:MATH1:SDEVIATION:STATE 0;:
MEASURE:MATH1:TY1INTEG:STATE 0;:
MEASURE:MATH1:TY2INTEG:STATE 0;:
MEASURE:MATH1:XY1INTEG:STATE 0;:
MEASURE:MATH1:XY2INTEG:STATE 0;:
MEASURE:MATH1:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;:MEASURE:
MATH1:DELAY:REFERENCE:SOURCE TRACE;
TRACE MATH1;SLOPE RISE;COUNT 1;:
MEASURE:MATH1:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -3.00,0.00,3.00;:MEASURE:MATH1:
METHOD AUTO;:MEASURE:MATH2:
AMPLITUDE:STATE 0;:MEASURE:MATH2:
AVERAGE:STATE 0;:MEASURE:MATH2:
AVGFREQ:STATE 0;:MEASURE:MATH2:
AVGPERIOD:STATE 0;:MEASURE:MATH2:
BWIDTH1:STATE 0;:MEASURE:MATH2:
BWIDTH2:STATE 0;:MEASURE:MATH2:
DUTYCYCLE:STATE 0;:MEASURE:MATH2:
FALL:STATE 0;:MEASURE:MATH2:
FREQUENCY:STATE 0;:MEASURE:MATH2:
HIGH:STATE 0;:MEASURE:MATH2:LOW:

```

6.18 MEASure Group

STATE 0;:MEASURE:MATH2:MAXIMUM:
STATE 0;:MEASURE:MATH2:MIDDLE:
STATE 0;:MEASURE:MATH2:MINIMUM:
STATE 0;:MEASURE:MATH2:NOVERSHOOT:
STATE 0;:MEASURE:MATH2:NWIDTH:
STATE 0;:MEASURE:MATH2:PERIOD:
STATE 0;:MEASURE:MATH2:PNUMBER:
STATE 0;:MEASURE:MATH2:POVERSHOOT:
STATE 0;:MEASURE:MATH2:PTOPEAK:
STATE 0;:MEASURE:MATH2:PWIDTH:
STATE 0;:MEASURE:MATH2:RISE:
STATE 0;:MEASURE:MATH2:RMS:STATE 0;:
MEASURE:MATH2:SDEVIATION:STATE 0;:
MEASURE:MATH2:TY1INTEG:STATE 0;:
MEASURE:MATH2:TY2INTEG:STATE 0;:
MEASURE:MATH2:XY1INTEG:STATE 0;:
MEASURE:MATH2:XY2INTEG:STATE 0;:
MEASURE:MATH2:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;:MEASURE:
MATH2:DELAY:REFERENCE:SOURCE TRACE;
TRACE MATH2;SLOPE RISE;COUNT 1;:
MEASURE:MATH2:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -3.00,0.00,3.00;:MEASURE:MATH2:
METHOD AUTO;:MEASURE:MATH3:
AMPLITUDE:STATE 0;:MEASURE:MATH3:
AVERAGE:STATE 0;:MEASURE:MATH3:
AVGFREQ:STATE 0;:MEASURE:MATH3:
AVGPERIOD:STATE 0;:MEASURE:MATH3:
BWIDTH1:STATE 0;:MEASURE:MATH3:
BWIDTH2:STATE 0;:MEASURE:MATH3:
DUTYCYCLE:STATE 0;:MEASURE:MATH3:
FALL:STATE 0;:MEASURE:MATH3:
FREQUENCY:STATE 0;:MEASURE:MATH3:
HIGH:STATE 0;:MEASURE:MATH3:LOW:
STATE 0;:MEASURE:MATH3:MAXIMUM:
STATE 0;:MEASURE:MATH3:MIDDLE:
STATE 0;:MEASURE:MATH3:MINIMUM:
STATE 0;:MEASURE:MATH3:NOVERSHOOT:
STATE 0;:MEASURE:MATH3:NWIDTH:
STATE 0;:MEASURE:MATH3:PERIOD:
STATE 0;:MEASURE:MATH3:PNUMBER:
STATE 0;:MEASURE:MATH3:POVERSHOOT:
STATE 0;:MEASURE:MATH3:PTOPEAK:
STATE 0;:MEASURE:MATH3:PWIDTH:
STATE 0;:MEASURE:MATH3:RISE:
STATE 0;:MEASURE:MATH3:RMS:STATE 0;:
MEASURE:MATH3:SDEVIATION:STATE 0;:
MEASURE:MATH3:TY1INTEG:STATE 0;:
MEASURE:MATH3:TY2INTEG:STATE 0;:
MEASURE:MATH3:XY1INTEG:STATE 0;:
MEASURE:MATH3:XY2INTEG:STATE 0;:
MEASURE:MATH3:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;:MEASURE:
MATH3:DELAY:REFERENCE:SOURCE TRACE;
TRACE MATH2;SLOPE RISE;COUNT 1;:
MEASURE:MATH3:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -3.00,0.00,3.00;:MEASURE:MATH3:
METHOD AUTO;:MEASURE:MATH4:
AMPLITUDE:STATE 0;:MEASURE:MATH4:
AVERAGE:STATE 0;:MEASURE:MATH4:
AVGFREQ:STATE 0;:MEASURE:MATH4:
AVGPERIOD:STATE 0;:MEASURE:MATH4:
BWIDTH1:STATE 0;:MEASURE:MATH4:
BWIDTH2:STATE 0;:MEASURE:MATH4:
DUTYCYCLE:STATE 0;:MEASURE:MATH4:
FALL:STATE 0;:MEASURE:MATH4:
FREQUENCY:STATE 0;:MEASURE:MATH4:

HIGH:STATE 0;:MEASURE:MATH4:LOW:
STATE 0;:MEASURE:MATH4:MAXIMUM:
STATE 0;:MEASURE:MATH4:MIDDLE:
STATE 0;:MEASURE:MATH4:MINIMUM:
STATE 0;:MEASURE:MATH4:NOVERSHOOT:
STATE 0;:MEASURE:MATH4:NWIDTH:
STATE 0;:MEASURE:MATH4:PERIOD:
STATE 0;:MEASURE:MATH4:PNUMBER:
STATE 0;:MEASURE:MATH4:POVERSHOOT:
STATE 0;:MEASURE:MATH4:PTOPEAK:
STATE 0;:MEASURE:MATH4:PWIDTH:
STATE 0;:MEASURE:MATH4:RISE:
STATE 0;:MEASURE:MATH4:RMS:STATE 0;:
MEASURE:MATH4:SDEVIATION:STATE 0;:
MEASURE:MATH4:TY1INTEG:STATE 0;:
MEASURE:MATH4:TY2INTEG:STATE 0;:
MEASURE:MATH4:XY1INTEG:STATE 0;:
MEASURE:MATH4:XY2INTEG:STATE 0;:
MEASURE:MATH4:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;:MEASURE:
MATH4:DELAY:REFERENCE:SOURCE TRACE;
TRACE MATH2;SLOPE RISE;COUNT 1;:
MEASURE:MATH4:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -3.00,0.00,3.00;:MEASURE:MATH4:
METHOD AUTO;:MEASURE:MATH5:
AMPLITUDE:STATE 0;:MEASURE:MATH5:
AVERAGE:STATE 0;:MEASURE:MATH5:
AVGFREQ:STATE 0;:MEASURE:MATH5:
AVGPERIOD:STATE 0;:MEASURE:MATH5:
BWIDTH1:STATE 0;:MEASURE:MATH5:
BWIDTH2:STATE 0;:MEASURE:MATH5:
DUTYCYCLE:STATE 0;:MEASURE:MATH5:
FALL:STATE 0;:MEASURE:MATH5:
FREQUENCY:STATE 0;:MEASURE:MATH5:
HIGH:STATE 0;:MEASURE:MATH5:LOW:
STATE 0;:MEASURE:MATH5:MAXIMUM:
STATE 0;:MEASURE:MATH5:MIDDLE:
STATE 0;:MEASURE:MATH5:MINIMUM:
STATE 0;:MEASURE:MATH5:NOVERSHOOT:
STATE 0;:MEASURE:MATH5:NWIDTH:
STATE 0;:MEASURE:MATH5:PERIOD:
STATE 0;:MEASURE:MATH5:PNUMBER:
STATE 0;:MEASURE:MATH5:POVERSHOOT:
STATE 0;:MEASURE:MATH5:PTOPEAK:
STATE 0;:MEASURE:MATH5:PWIDTH:
STATE 0;:MEASURE:MATH5:RISE:
STATE 0;:MEASURE:MATH5:RMS:STATE 0;:
MEASURE:MATH5:SDEVIATION:STATE 0;:
MEASURE:MATH5:TY1INTEG:STATE 0;:
MEASURE:MATH5:TY2INTEG:STATE 0;:
MEASURE:MATH5:XY1INTEG:STATE 0;:
MEASURE:MATH5:XY2INTEG:STATE 0;:
MEASURE:MATH5:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;:MEASURE:
MATH5:DELAY:REFERENCE:SOURCE TRACE;
TRACE MATH2;SLOPE RISE;COUNT 1;:
MEASURE:MATH5:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -3.00,0.00,3.00;:MEASURE:MATH5:
METHOD AUTO;:MEASURE:MATH6:
AMPLITUDE:STATE 0;:MEASURE:MATH6:
AVERAGE:STATE 0;:MEASURE:MATH6:
AVGFREQ:STATE 0;:MEASURE:MATH6:
AVGPERIOD:STATE 0;:MEASURE:MATH6:
BWIDTH1:STATE 0;:MEASURE:MATH6:
BWIDTH2:STATE 0;:MEASURE:MATH6:
DUTYCYCLE:STATE 0;:MEASURE:MATH6:
FALL:STATE 0;:MEASURE:MATH6:
FREQUENCY:STATE 0;:MEASURE:MATH6:

```

FREQUENCY:STATE 0;:MEASURE:MATH6:
HIGH:STATE 0;:MEASURE:MATH6:LOW:
STATE 0;:MEASURE:MATH6:MAXIMUM:
STATE 0;:MEASURE:MATH6:MIDDLE:
STATE 0;:MEASURE:MATH6:MINIMUM:
STATE 0;:MEASURE:MATH6:NOVERSHOOT:
STATE 0;:MEASURE:MATH6:NWIDTH:
STATE 0;:MEASURE:MATH6:PERIOD:
STATE 0;:MEASURE:MATH6:PNUMBER:
STATE 0;:MEASURE:MATH6:POVERSHOOT:
STATE 0;:MEASURE:MATH6:PTOPEAK:
STATE 0;:MEASURE:MATH6:PWIDTh:
STATE 0;:MEASURE:MATH6:RISE:
STATE 0;:MEASURE:MATH6:RMS:STATE 0;:
MEASURE:MATH6:SDEVIATION:STATE 0;:
MEASURE:MATH6:TY1INTEG:STATE 0;:
MEASURE:MATH6:TY2INTEG:STATE 0;:
MEASURE:MATH6:XY1INTEG:STATE 0;:
MEASURE:MATH6:XY2INTEG:STATE 0;:
MEASURE:MATH6:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;:MEASURE:
MATH6:DELAY:REFERENCE:SOURCE TRACE;
TRACE MATH2;SLOPE RISE;COUNT 1;:
MEASURE:MATH6:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -3.00,0.00,3.00;:MEASURE:MATH6:
METHOD AUTO;:MEASURE:MATH7:
AMPLITUDE:STATE 0;:MEASURE:MATH7:
AVERAGE:STATE 0;:MEASURE:MATH7:
AVGFREQ:STATE 0;:MEASURE:MATH7:
AVGPERIOD:STATE 0;:MEASURE:MATH7:
BWIDTH1:STATE 0;:MEASURE:MATH7:
BWIDTH2:STATE 0;:MEASURE:MATH7:
DUTYCYCLE:STATE 0;:MEASURE:MATH7:
FALL:STATE 0;:MEASURE:MATH7:
FREQUENCY:STATE 0;:MEASURE:MATH7:
HIGH:STATE 0;:MEASURE:MATH7:LOW:
STATE 0;:MEASURE:MATH7:MAXIMUM:
STATE 0;:MEASURE:MATH7:MIDDLE:
STATE 0;:MEASURE:MATH7:MINIMUM:
STATE 0;:MEASURE:MATH7:NOVERSHOOT:
STATE 0;:MEASURE:MATH7:NWIDTH:
STATE 0;:MEASURE:MATH7:PERIOD:
STATE 0;:MEASURE:MATH7:PNUMBER:
STATE 0;:MEASURE:MATH7:POVERSHOOT:
STATE 0;:MEASURE:MATH7:PTOPEAK:
STATE 0;:MEASURE:MATH7:PWIDTh:
STATE 0;:MEASURE:MATH7:RISE:
STATE 0;:MEASURE:MATH7:RMS:STATE 0;:
MEASURE:MATH7:SDEVIATION:STATE 0;:
MEASURE:MATH7:TY1INTEG:STATE 0;:
MEASURE:MATH7:TY2INTEG:STATE 0;:
MEASURE:MATH7:XY1INTEG:STATE 0;:
MEASURE:MATH7:XY2INTEG:STATE 0;:
MEASURE:MATH7:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;:MEASURE:
MATH7:DELAY:REFERENCE:SOURCE TRACE;
TRACE MATH2;SLOPE RISE;COUNT 1;:
MEASURE:MATH7:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -3.00,0.00,3.00;:MEASURE:MATH7:
METHOD AUTO;:MEASURE:MATH8:
AMPLITUDE:STATE 0;:MEASURE:MATH8:
AVERAGE:STATE 0;:MEASURE:MATH8:
AVGFREQ:STATE 0;:MEASURE:MATH8:
AVGPERIOD:STATE 0;:MEASURE:MATH8:
BWIDTH1:STATE 0;:MEASURE:MATH8:
BWIDTH2:STATE 0;:MEASURE:MATH8:
DUTYCYCLE:STATE 0;:MEASURE:MATH8:

```

```

FALL:STATE 0;:MEASURE:MATH8:
FREQUENCY:STATE 0;:MEASURE:MATH8:
HIGH:STATE 0;:MEASURE:MATH8:LOW:
STATE 0;:MEASURE:MATH8:MAXIMUM:
STATE 0;:MEASURE:MATH8:MIDDLE:
STATE 0;:MEASURE:MATH8:MINIMUM:
STATE 0;:MEASURE:MATH8:NOVERSHOOT:
STATE 0;:MEASURE:MATH8:NWIDTH:
STATE 0;:MEASURE:MATH8:PERIOD:
STATE 0;:MEASURE:MATH8:PNUMBER:
STATE 0;:MEASURE:MATH8:PTOPEAK:
STATE 0;:MEASURE:MATH8:PWIDTh:
STATE 0;:MEASURE:MATH8:RISE:
STATE 0;:MEASURE:MATH8:RMS:STATE 0;:
MEASURE:MATH8:SDEVIATION:STATE 0;:
MEASURE:MATH8:TY1INTEG:STATE 0;:
MEASURE:MATH8:TY2INTEG:STATE 0;:
MEASURE:MATH8:XY1INTEG:STATE 0;:
MEASURE:MATH8:XY2INTEG:STATE 0;:
MEASURE:MATH8:DELAY:STATE OFF;
MEASURE:SLOPE RISE;COUNT 1;:MEASURE:
MATH8:DELAY:REFERENCE:SOURCE TRACE;
TRACE MATH2;SLOPE RISE;COUNT 1;:
MEASURE:MATH8:DPROXIMAL:
MODE PERCENT;PERCENT 10.0,50.0,90.0;
UNIT -3.00,0.00,3.00;:MEASURE:MATH8:
METHOD AUTO;:MEASURE:CYCLE:TRACE 1;:
MEASURE:TRANGE -5.0000000,5.0000000;
ONECYCLE 0

```

:MEASure:{CHANnel<x>|MATH<x>}?

Function Turns ON/OFF all the waveform parameters of the channel or queries the current setting.

Syntax :MEASure:{CHANnel<x>|MATH<x>}?
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8

Example (The following is an example for CH1.)

```

:MEASURE:CHANNEL1? -> :MEASURE:
CHANNEL1:AMPLITUDE:STATE 0;:MEASURE:
CHANNEL1:AVERAGE:STATE 0;:MEASURE:
CHANNEL1:AVGFREQ:STATE 0;:MEASURE:
CHANNEL1:AVGPERIOD:STATE 0;:MEASURE:
CHANNEL1:BWIDTH1:STATE 0;:MEASURE:
CHANNEL1:BWIDTH2:STATE 0;:MEASURE:
CHANNEL1:DUTYCYCLE:STATE 0;:MEASURE:
CHANNEL1:FALL:STATE 0;:MEASURE:
CHANNEL1:FREQUENCY:STATE 0;:MEASURE:
CHANNEL1:HIGh:STATE 0;:MEASURE:
CHANNEL1:LOW:STATE 0;:MEASURE:
CHANNEL1:MAXIMUM:STATE 0;:MEASURE:
CHANNEL1:MIDDLE:STATE 0;:MEASURE:
CHANNEL1:MINIMUM:STATE 0;:MEASURE:
CHANNEL1:NOVERSHOOT:STATE 0;:
MEASURE:CHANNEL1:NWIDTH:STATE 0;:
MEASURE:CHANNEL1:PERIOD:STATE 0;:
MEASURE:CHANNEL1:PNUMBER:STATE 0;:
MEASURE:CHANNEL1:POVERSHOOT:
STATE 0;:MEASURE:CHANNEL1:PTOPEAK:
STATE 0;:MEASURE:CHANNEL1:PWIDTh:
STATE 0;:MEASURE:CHANNEL1:RISE:
STATE 0;:MEASURE:CHANNEL1:RMS:
STATE 0;:MEASURE:CHANNEL1:
SDEVIATION:STATE 0;:MEASURE:
CHANNEL1:TY1INTEG:STATE 0;:MEASURE:
CHANNEL1:TY2INTEG:STATE 0;:MEASURE:
CHANNEL1:XY1INTEG:STATE 0;:MEASURE:
CHANNEL1:XY2INTEG:STATE 0;:MEASURE:
CHANNEL1:DELAY:STATE OFF;MEASURE:

```

6.18 MEASure Group

```
SLOPE RISE;COUNT 1;:MEASURE:
CHANNEL1:DELAY:REFERENCE:
SOURCE TRACE;TRACE 1;SLOPE RISE;
COUNT 1;:MEASURE:CHANNEL1:
DPROXIMAL:MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00;:MEASURE:CHANNEL1:
METHOD AUTO
```

:MEASure:{CHANnel<x>|MATH<x>}

:ALL

Function Turns ON/OFF collectively all the measurement items of the channel.

Syntax :MEASure:{CHANnel<x>|MATH<x>}:ALL
{<Boolean>}

<x> of CHANnel<x>=1 to 16

<x> of MATH<x>=1 to 8

Example (The following is an example for CH1.)

```
:MEASURE:CHANNEL1:ALL OFF
```

:MEASure:{CHANnel<x>|MATH<x>}

:COPY

Function Copies the ON/OFF setting of all measurement items of a specified channel to all other channels.

Syntax :MEASure:{CHANnel<x>|MATH<x>}:COPY
<x> of CHANnel<x>=1 to 16

<x> of MATH<x>=1 to 8

Example (The following is an example of copying the ON/OFF setting of all items of CH1 to all other channels.)

```
:MEASURE:CHANNEL1:COPY
```

:MEASure:{CHANnel<x>|MATH<x>}

:DELAY?

Function Queries all settings of the source waveform of the delay between channels.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:DELAY?

<x> of CHANnel<x>=1 to 16

<x> of MATH<x>=1 to 8

Example :MEASURE:CHANNEL1:DELAY? ->

```
:MEASURE:CHANNEL1:DELAY:
```

```
STATE OFF;MEASURE:SLOPE RISE;
```

```
COUNT 1;:MEASURE:CHANNEL1:
```

```
DELAY:REFERENCE:SOURCE TRACE;
```

```
TRACE 1;SLOPE RISE;COUNT 1
```

:MEASure:{CHANnel<x>|MATH<x>}

:DELAY:COUNT?

Function Queries the statistical processing count of the delay between channels.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:DELAY:COUNT?

<x> of CHANnel<x>=1 to 16

<x> of MATH<x>=1 to 8

Example :MEASURE:CHANNEL1:DELAY:COUNT? ->

```
:MEASURE:CHANNEL1:DELAY:COUNT 1
```

:MEASure:{CHANnel<x>|MATH<x>}: :DELAY:{MAXimum|MEAN|MINimum| SDEviation}?

Function Queries the statistical value of the delay between channels.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:DELAY:{MAXimum|MEAN|

MINimum|SDEviation}?

<x> of CHANnel<x>=1 to 16

<x> of MATH<x>=1 to 8

Example (The following is an example for the maximum value.)

```
:MEASURE:CHANNEL1:DELAY:MAXIMUM? ->
```

```
:MEASURE:CHANNEL1:DELAY:
```

```
MAXIMUM -69.000000E-06
```

:MEASure:{CHANnel<x>|MATH<x>}

:DELAY:MEASure?

Function Queries all settings of the source waveform of the delay between channels.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:DELAY:MEASure?

<x> of CHANnel<x>=1 to 16

<x> of MATH<x>=1 to 8

Example :MEASURE:CHANNEL1:DELAY:MEASURE? ->

```
:MEASURE:CHANNEL1:DELAY:MEASURE:
```

```
SLOPE RISE;COUNT 1
```

:MEASure:{CHANnel<x>|MATH<x>}

:DELAY:MEASure:COUNT

Function Sets the number of counts of the source waveform of the delay between channels.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:DELAY:MEASure:COUNT {<NRf>}

:MEASure:{CHANnel<x>|MATH<x>}
:DELAY:MEASure:COUNT?

<x> of CHANnel<x>=1 to 16

<x> of MATH<x>=1 to 8

<NRf>=1 to 9

Example :MEASURE:CHANNEL1:DELAY:MEASURE:

```
COUNT 2
```

```
:MEASURE:CHANNEL1:DELAY:MEASURE:
```

```
COUNT? ->:MEASURE:CHANNEL1:DELAY:
```

```
MEASURE:COUNT 2
```

:MEASure:{CHANnel<x>|MATH<x>}

:DELAY:MEASure:SLOPE

Function Sets the slope of the source waveform of the delay between channels.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:DELAY:MEASure:SLOPE {RISE|FALL}

:MEASure:{CHANnel<x>|MATH<x>}
:DELAY:MEASure:SLOPE?

<x> of CHANnel<x>=1 to 16

<x> of MATH<x>=1 to 8

Example :MEASURE:CHANNEL1:DELAY:MEASURE:

```
SLOPE RISE
```

```
:MEASURE:CHANNEL1:DELAY:MEASURE:
```

```
SLOPE? ->:MEASURE:CHANNEL1:DELAY:
```

```
MEASURE:SLOPE RISE
```

:MEASure:{CHANnel<x>|MATH<x>}
:DElay:REfERENCE?

Function Queries all settings of the reference waveform of the delay between channels.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DElay:REfERENCE?
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8

Example **:MEASURE:CHANNEL1:DELAY:REFERENCE?**
 -> **:MEASURE:CHANNEL1:DELAY:REFERENCE:SOURCE TRACE;**
TRACE 1;SLOPE RISE;COUNT 1

:MEASure:{CHANnel<x>|MATH<x>}
:DElay:REfERENCE:COUNT

Function Sets the number of edge detection count of the reference waveform of the delay between channels.

Syntax **:MEASure:{CHANnel<x>|MATH<x>|}**
:DElay:REfERENCE:COUNT {<NRf>}
:MEASure:{CHANnel<x>|MATH<x>|}
:DElay:REfERENCE:COUNT?
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8
 <NRf>=1 to 9

Example **:MEASURE:CHANNEL1:DELAY:REFERENCE:COUNT 2**
:MEASURE:CHANNEL1:DELAY:REFERENCE:COUNT? -> :MEASURE:CHANNEL1:DELAY:REFERENCE:COUNT 2

:MEASure:{CHANnel<x>|MATH<x>}
:DElay:REfERENCE:SLOPe

Function Sets the edge detection slope of the reference waveform of the delay between channels.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DElay:REfERENCE:SLOPe {RISE|FALL}
:MEASure:{CHANnel<x>|MATH<x>}
:DElay:REfERENCE:SLOPe?
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8

Example **:MEASURE:CHANNEL1:DELAY:REFERENCE:SLOPE RISE**
:MEASURE:CHANNEL1:DELAY:REFERENCE:SLOPE? -> :MEASURE:CHANNEL1:DELAY:REFERENCE:SLOPE RISE

:MEASure:{CHANnel<x>|MATH<x>}
:DElay:REfERENCE:SOURce

Function Sets the reference of the delay between channels of the trace waveform to be the trigger point or the waveform or queries the current setting.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DElay:REfERENCE:SOURce {TRACE|TRIGger}
:MEASure:{CHANnel<x>|MATH<x>}
:DElay:REfERENCE:SOURce?
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8

Example **:MEASURE:CHANNEL1:DELAY:REFERENCE:SOURCE TRACE**
:MEASURE:CHANNEL1:DELAY:REFERENCE:SOURCE? -> :MEASURE:CHANNEL1:DELAY:REFERENCE:SOURCE TRACE

:MEASure:{CHANnel<x>|MATH<x>}
:DElay:REfERENCE:TRACe

Function Sets the trace of the reference waveform of the delay between channels.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DElay:REfERENCE:TRACe {<NRf>|MATH<x>}
:MEASure:{CHANnel<x>|MATH<x>}
:DElay:REfERENCE:TRACe?
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8
 <NRf>=1 to 16

Example **:MEASURE:CHANNEL1:DELAY:REFERENCE:TRACE 2**
:MEASURE:CHANNEL1:DELAY:REFERENCE:TRACE? -> :MEASURE:CHANNEL1:DELAY:REFERENCE:TRACE 2

:MEASure:{CHANnel<x>|MATH<x>}
:DElay:STATe

Function Sets the display format of the delay parameter or queries the current setting.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DElay:STATe {TIME|OFF|DEGREE}
:MEASure:{CHANnel<x>|MATH<x>}
:DElay:STATe?
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8

Example **:MEASURE:CHANNEL1:DELAY:STATE TIME**
:MEASURE:CHANNEL1:DELAY:STATE? -> :MEASURE:CHANNEL1:DELAY:STATE TIME

:MEASure:{CHANnel<x>|MATH<x>}:<DElay>:VALUe?

Function Queries the delay measurement value of the waveform parameter.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DElay:VALUe? [{<NRf>}]
 <x> of CHANnel<x>=1 to 16
 <x> of MATH<x>=1 to 8

Example (The following is an example for the average value of CH1.)
:MEASURE:CHANNEL1:DELAY:VALUE? -> :MEASURE:CHANNEL1:DELAY:VALUE 4.5900000E+03

Description

- If the measurement is not possible, "NAN (Not A Number)" is returned. The last <NRf> is used to query the parameter value of the <NRf> time after executing the statistical processing. If the value corresponding to the relevant count is not present, "NAN" (Not A Number)" is returned.
- <NRf> can be omitted. If omitted, inquiry is made on the newest waveform parameter value in the history memory. If <NRf> is attached, inquiry is made on parameter value of the <NRf>th oldest waveform from the newest waveform in the history memory.

6.18 MEASure Group

:MEASure:{CHANnel<x>|MATH<x>} :DPRoximal?

Function Queries all settings related to distal, mesial, and proximal.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DPRoximal?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8

Example **:MEASURE:CHANNEL1:DPROXIMAL? ->**
:MEASURE:CHANNEL1:DPROXIMAL:
MODE PERCENT;
PERCENT 10.0,50.0,90.0;
UNIT -150.000E+00,0.0E+00,
150.000E+00

:MEASure:{CHANnel<x>|MATH<x>} :DPRoximal:MODE

Function Sets the mode of the distal, mesial, and proximal points or queries the current setting.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DPRoximal:MODE {PERCent|UNIT}
:MEASure:{CHANnel<x>|MATH<x>}
:DPRoximal:MODE?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8

Example **:MEASURE:CHANNEL1:DPROXIMAL:**
MODE PERCENT
:MEASURE:CHANNEL1:DPROXIMAL:MODE?
-> :MEASURE:CHANNEL1:DPROXIMAL:
MODE PERCENT

:MEASure:{CHANnel<x>|MATH<x>} :DPRoximal:PERCent

Function Sets the distal, mesial, and proximal points in percentage or queries the current setting.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DPRoximal:PERCent {<NRf>,<NRf>,<NRf>}
:MEASure:{CHANnel<x>|MATH<x>}
:DPRoximal:PERCent?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
<NRf>=0 to 100 (% , 1 steps)
(In the order <proximal>, <mesial>, and <distal>)

Example **:MEASURE:CHANNEL1:DPROXIMAL:**
PERCENT 40,60,80
:MEASURE:CHANNEL1:DPROXIMAL:
PERCENT? -> **:MEASURE:CHANNEL1:**
DPROXIMAL:PERCENT 40.0,60.0,80.0

:MEASure:{CHANnel<x>|MATH<x>} :DPRoximal:UNIT

Function Sets the distal, mesial, and proximal points or queries the current setting.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:DPRoximal:
UNIT{<Voltage>,<Voltage>,<Voltage>|
<Current>,<Current>,<Current>|
<NRf>,<NRf>,<NRf>}
:MEASure:{CHANnel<x>|MATH<x>}
:DPRoximal:UNIT?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
For CHANnel<x>: Voltage, <Current>,
<NRf>=The selectable range varies
depending on the range and offset settings.
For details, see the *User's Manual*.
For MATH<x>: <NRf>=±5 div (0.01 div steps)
(In the order <proximal>, <mesial>, and
<distal>)

Example **:MEASURE:CHANNEL1:DPROXIMAL:**
UNIT -50V,0V,50V
:MEASURE:CHANNEL1:DPROXIMAL:UNIT?
-> :MEASURE:CHANNEL1:DPROXIMAL:
UNIT -50.000E+00,0.0E+00,50.000E+00

Description When the target is MATH<x>, only <NRf> can be specified for the unit.

:MEASure:{CHANnel<x>|MATH<x>} :METHod

Function Sets the High and Low points or queries the current setting.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:METHod {AUTO|MAXMin}
:MEASure:{CHANnel<x>|MATH<x>}
:METHod?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8

Example **:MEASURE:CHANNEL1:METHod AUTO**
:MEASURE:CHANNEL1:METHod? ->
:MEASURE:CHANNEL1:METHod AUTO

:MEASure:{CHANnel<x>|MATH<x>} :<Parameter>?

Function Queries the settings related to the waveform parameter of the waveform.

Syntax **:MEASure:{CHANnel<x>|MATH<x>}**
:<Parameter>?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
<Parameter>={AMPLitude|AVERage|
AVGFreq|AVGPeriod|BWidth1|BWidth2|
DUTYcycle|FALL|FREQuency|HIGH|LOW|
MAXimum|MIDDLE|MINimum|NOVershoot|
NWIDTH|PERiod|PNUMBER|POVershoot|
PTOPeak|PWIDth|RISE|RMS|SDEVIation|
TY1Integ|TY2Integ|XY1Integ|XY2Integ}

Example (The following is an example for the average value of CH1.)
:MEASURE:CHANNEL1:AVERAGE? ->
:MEASURE:CHANNEL1:AVERAGE:STATE 0

**:MEASure:{CHANnel<x>|MATH<x>}:
<Parameter>:COUNT?**

Function Queries the number of measured values of the cycle statistical processing of the parameter.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:<Parameter>:COUNT?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
<Parameter>={AMPLitude|AVERage|
AVGFreq|AVGPeriod|BWIDTH1|BWIDTH2|
DUTYcycle|FALL|FREQuency|HIGH|LOW|
MAXimum|MIDDLE|MINimum|NOVershoot|
NWIDTH|PERiod|PNUMBER|POVershoot|
PTOPeak|PWIDTH|RISE|RMS|SDEVIation|
TY1Integ|TY2Integ|XY1Integ|XY2Integ}

Example (The following is an example for the average value of CH1.)
:MEASURE:CHANNEL1:AVERAGE:COUNT? ->
:MEASURE:CHANNEL1:AVERAGE:COUNT 0

**:MEASure:{CHANnel<x>|MATH<x>}
:<Parameter>:{MAXimum|MEAN|MINimum|
SDEVIation}?**

Function Queries the cycle statistical value of the waveform parameter.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:<Parameter>:{MAXimum|MEAN|
MINimum|SDEVIation}?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
<Parameter>={AMPLitude|AVERage|
AVGFreq|AVGPeriod|BWIDTH1|BWIDTH2|
DUTYcycle|FALL|FREQuency|HIGH|LOW|
MAXimum|MIDDLE|MINimum|NOVershoot|
NWIDTH|PERiod|PNUMBER|POVershoot|
PTOPeak|PWIDTH|RISE|RMS|SDEVIation|
TY1Integ|TY2Integ|XY1Integ|XY2Integ}

Example (The following is an example for the maximum value.)
:MEASURE:CHANNEL1:AVERAGE:MAXIMUM?
-> :MEASURE:CHANNEL1:AVERAGE:
MAXIMUM 38.506321E-03

Description If the statistics cannot be determined, "NAN (Not A Number)" is returned.

**:MEASure:{CHANnel<x>|MATH<x>}
:<Parameter>:STATE**

Function Turns ON/OFF the waveform parameter of the waveform one by one or queries the current setting.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:<Parameter>:STATE{<Boolean>}
:MEASure:{CHANnel<x>|MATH<x>}
:<Parameter>:STATE?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
<Parameter>={AMPLitude|AVERage|
AVGFreq|AVGPeriod|BWIDTH1|BWIDTH2|
DUTYcycle|FALL|FREQuency|HIGH|LOW|
MAXimum|MIDDLE|MINimum|NOVershoot|
NWIDTH|PERiod|PNUMBER|POVershoot|
PTOPeak|PWIDTH|RISE|RMS|SDEVIation|
TY1Integ|TY2Integ|XY1Integ|XY2Integ}

Example (The following is an example for the average value of CH1.)
:MEASURE:CHANNEL1:AVERAGE:STATE ON
:MEASURE:CHANNEL1:AVERAGE:STATE? ->
:MEASURE:CHANNEL1:AVERAGE:STATE 1

**:MEASure:{CHANnel<x>|MATH<x>}
:<Parameter>:VALUE?**

Function Queries the value of the waveform parameter of the waveform that is measured automatically.

Syntax :MEASure:{CHANnel<x>|MATH<x>}
:<Parameter>:VALUE?
<x> of CHANnel<x>=1 to 16
<x> of MATH<x>=1 to 8
<Parameter>={AMPLitude|AVERage|
AVGFreq|AVGPeriod|BWIDTH1|BWIDTH2|
DUTYcycle|FALL|FREQuency|HIGH|LOW|
MAXimum|MIDDLE|MINimum|NOVershoot|
NWIDTH|PERiod|PNUMBER|POVershoot|
PTOPeak|PWIDTH|RISE|RMS|SDEVIation|
TY1Integ|TY2Integ|XY1Integ|XY2Integ}

Example (The following is an example for the average value of CH1.)
:MEASURE:CHANNEL1:AVERAGE:VALUE? ->
:MEASURE:CHANNEL1:AVERAGE:
VALUE 115.95507E-03

Description If the measurement is not possible, "NAN (Not A Number)" is returned. The last <NRf> is used to query the parameter value of the <NRf> time after executing the statistical processing. If the value corresponding to the relevant count is not present, "NAN (Not A Number)" is returned.

In the case other than cycle statistical processing
<NRf> can be omitted. If omitted, inquiry is made on the newest waveform parameter value in the history memory. If <NRf> is attached, inquiry is made on parameter value of the <NRf>th oldest waveform from the newest waveform in the history memory.

In the case of cycle statistical processing
<NRf> can be omitted. If omitted, inquiry is made on the parameter value in the range of the last measured cycle. If <NRf> is attached, inquiry is made in the range of the cycle measured on the <NRf>th time from the left of the screen.

6.18 MEASure Group

:MEASure:CDEStination:{CHANnel<x>| MATH<x>}

Function	Sets the channel to which the ON/OFF settings of all measurement items of a certain channel are to be copied or queries the current setting.
Syntax	:MEASure:CDEStination:{CHANnel<x> MATH<x>} {<Boolean>} :MEASure:CDEStination:{CHANnel<x> MATH<x>}?
Example	:MEASURE:CDESTINATION:CHANNEL1 ON :MEASURE:CDESTINATION:CHANNEL1? -> :MEASURE:CDESTINATION:CHANNEL1 1

:MEASure:CDEStination:ALL

Function	Sets whether to copy the ON/OFF settings of all measurement items of a channel to all channels.
Syntax	:MEASure:CDEStination:ALL {<Boolean>} :MEASure:CDEStination:ALL?
Example	:MEASURE:CDESTINATION:ALL ON

:MEASure:CYCLE?

Function	Queries all settings related to the cycle statistical processing of waveform parameters.
Syntax	:MEASure:CYCLE?
Example	:MEASURE:CYCLE? -> :MEASURE:CYCLE: TRACE 1

:MEASure:CYCLE:ABORT

Function	Aborts the execution of the cycle statistical processing of waveform parameters.
Syntax	:MEASure:CYCLE:ABORT
Example	:MEASURE:CYCLE:ABORT

:MEASure:CYCLE:EXECute

Function	Executes the cycle statistical processing of waveform parameters.
Syntax	:MEASure:CYCLE:EXECute
Example	:MEASURE:CYCLE:EXECUTE

:MEASure:CYCLE:TRACe {OWN|<Nrf>| MATH<x>}

Function	Sets the target waveform of cycle statistical processing of waveform parameters or queries the current setting.
Syntax	:MEASure:CYCLE:TRACe {OWN <Nrf> MATH<x>} :MEASure:CYCLE:TRACe? <x> of MATH<x>=1 to 8 <Nrf>=1 to 16
Example	:MEASURE:CYCLE:TRACE OWN :MEASURE:CYCLE:TRACE? -> :MEASURE:CYCLE:TRACE OWN

:MEASure:MODE

Function	Sets the mode of the automated measurement of waveform parameters or queries the current setting.
Syntax	:MEASure:MODE {OFF ON CYCLE HISTory STATistics} :MEASure:MODE?
Example	:MEASURE:MODE ON :MEASURE:MODE? -> :MEASURE:MODE ON

:MEASure:ONECycle

Function	Turns ON/OFF the 1 cycle mode of the automated measurement of waveform parameters or queries the current setting.
Syntax	:MEASure:ONECycle {<Boolean>} :MEASure:ONECycle?
Example	:MEASURE:ONECYCLE ON :MEASURE:ONECYCLE? -> :MEASURE: ONECYCLE 1

:MEASure:TRANge (Time Range)

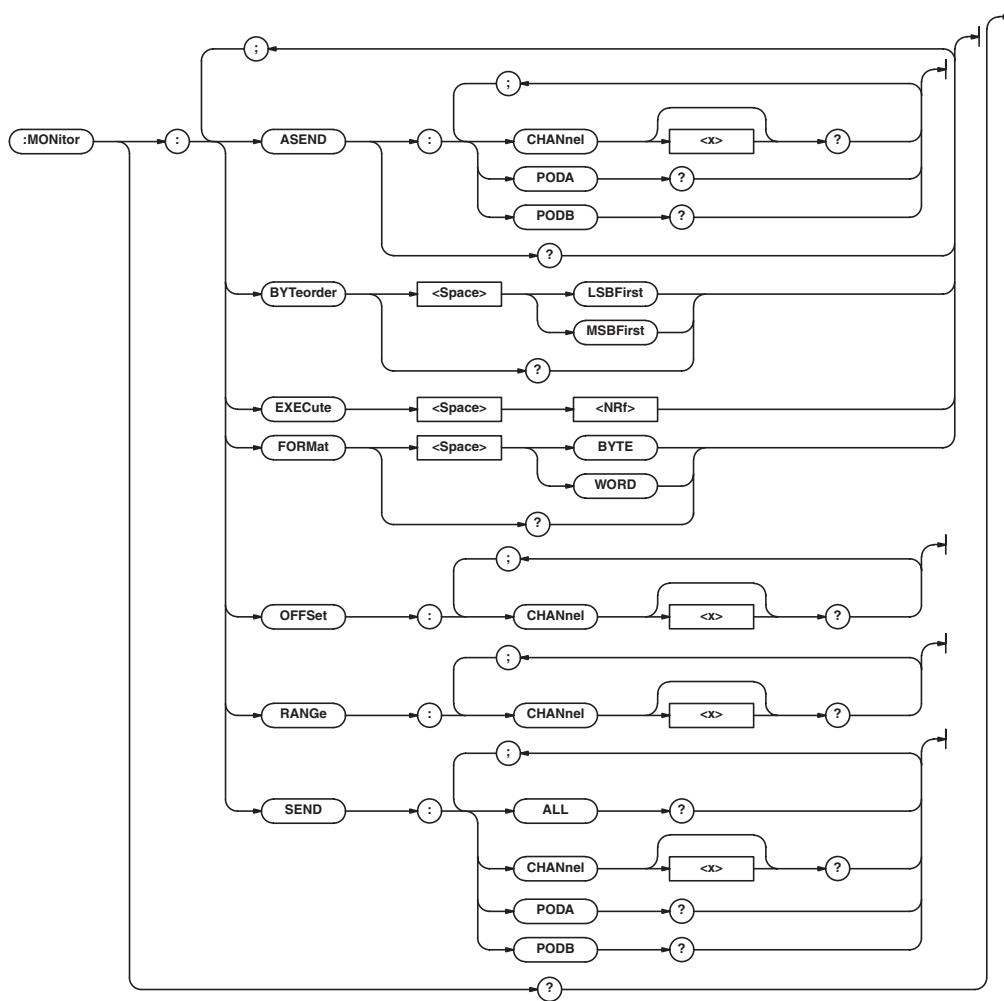
Function	Sets the measurement range of the automated measurement of waveform parameters or queries the current setting.
Syntax	:MEASure:TRANge {<Nrf>,<Nrf>} :MEASure:TRANge? <Nrf>=-5 to 5 divisions (10 divisions/record length steps)
Example	:MEASURE:TRANGE -4,4 :MEASURE:TRANGE? -> :MEASURE: TRANGE -4.0000000,4.0000000

:MEASure:WAIT?

Function	Waits for the completion of the automated measurement of waveform parameters with a timeout option.
Syntax	:MEASure:WAIT? {<Nrf>} <Nrf>=1 to 36000 (timeout time, in units of 100 ms)
Example	:MEASURE:WAIT? 100 -> :MEASURE: WAIT 1
Description	• If the execution of the automated measurement completes within the timeout time, 0 is returned; if it is not complete or automated measurement is not being executed, 1 is returned. • Even if the timeout time is set long, 0 is returned when the execution of the automated measurement is complete.

6.19 MONitor Group

The commands in this group deal with screen switching and numeric monitor output.



:MONitor:ASENd?

Response Format

Bina

Hexadecimal notation

```
:MONitor:ASENd:{CHANnel<x>|
PODA|PODB}?
```

MONitor:ASENd:CHAN<X>?

MONitor:ASENd:{PODA|PODB}?(Binary)

MONitor:ASENd:{PODA|PODB}?(Hexa)

:MONitor:BYTeorder

:MONitor:EXECute

:MONitor:FORMat

:MONitor:OFFSet:CHANnel<x>?

:MONitor:RANGe:CHANnel<x>?

```
:MONitor:SEND:{ALL|CHANnel<x>|PODA|PODB}?
```

Description	The output formats of :MONitor:SEND:{ALL CHANNEL<x> PODA PODB}? are BYTE and WORD (see :WAVEform:FORMAT). The data is output using the <Block data> format on all modules. The data consists of signed values except for the logic module.
-------------	--

For voltage modules, the data can be converted to voltage using the following equation.

$$\text{Voltage} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When measuring temperature, the data can be converted to temperature using the following equation.

$$\text{Temperature (}^{\circ}\text{C)} = \text{Data} \times \text{Division}$$

BYTE: Division = 25.6

WORD: Division = 0.1

In the case of a strain module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: 187.5

WORD: 48000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

For logic waveforms, the following format is used.

BYTE: 8-bit bit pattern (LSB: bit1, MSB: bit 8)

WORD: 16-bit bit pattern (upper 8 bits are PODB, lower 8 bits are the same as the PODA bit pattern)

For acceleration measurements, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When measuring frequency on the frequency module, the following equation is used to make a conversion to frequency.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When measuring RPMs on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When measuring RPSs on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When measuring the period on the frequency module, the following equation is used to make a conversion to time.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When measuring duty cycle on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When measuring the power frequency (PowerFreq) on the frequency module, the following equation is used to make a conversion to frequency.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

6.19 MONitor Group

When measuring the pulse width on the frequency module, the following equation is used to make a conversion to time.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When performing pulse integration (PulseInteg) on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

When measuring velocity on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of :MONitor:RANGe?

Offset=The return value of :MONitor:OFFSet?

For example, when outputting the data of a single channel (word), the output data is "#202XX" (where XX is the two-byte measured data).

If 10 channels of data is output when ALL is specified, the output data is

"#220XXXXXXXXXXXXXXXXXXXXX." When

ALL is specified, all channels that are installed are output (excluding logic data).

For channels whose input is turned off, 8000 is output for word data and 80 for byte data.

6.20 MTRigger Group

The command in this group deals with the manual trigger.



:MTRigger

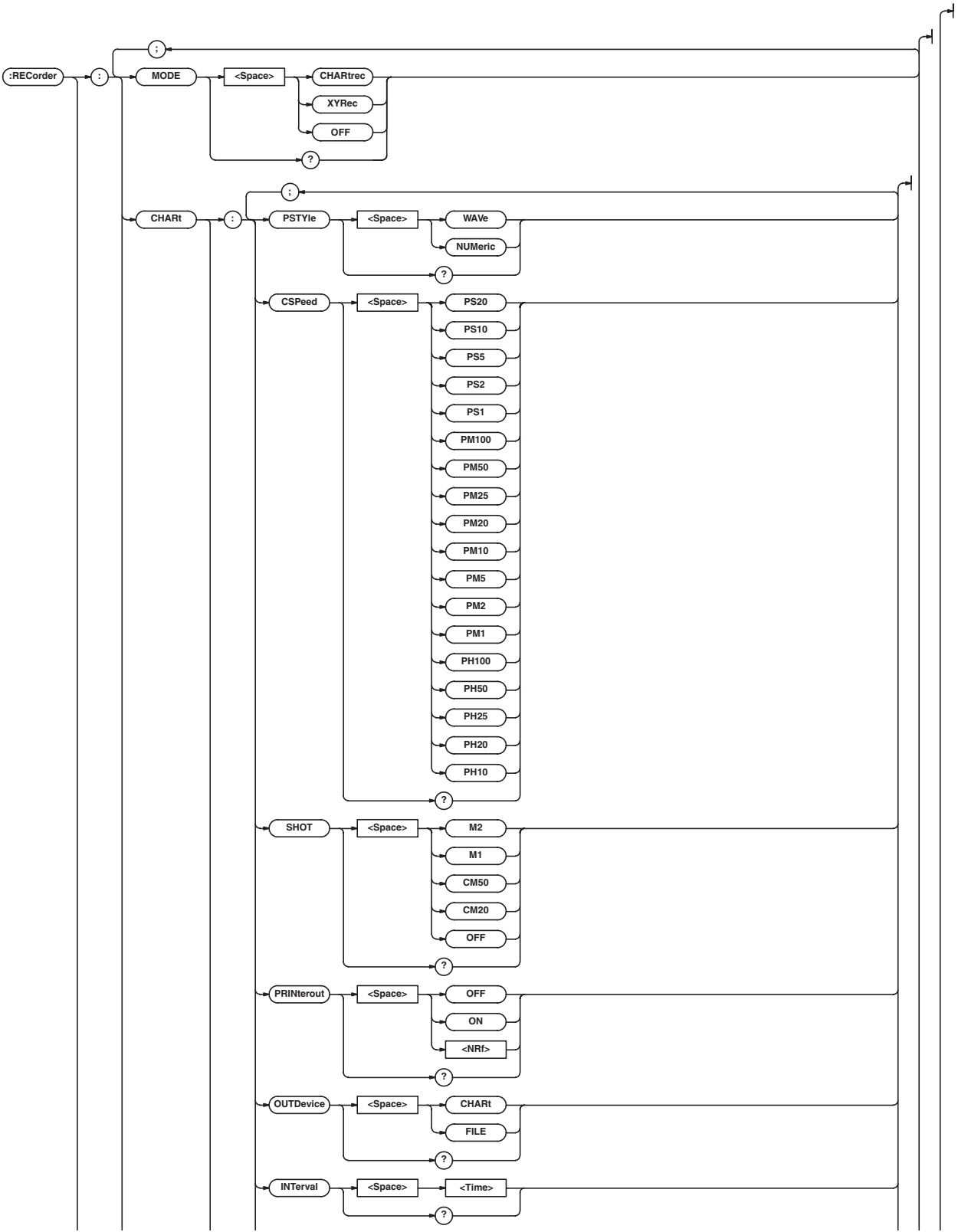
Function Activates the manual trigger.

Syntax :MTRigger

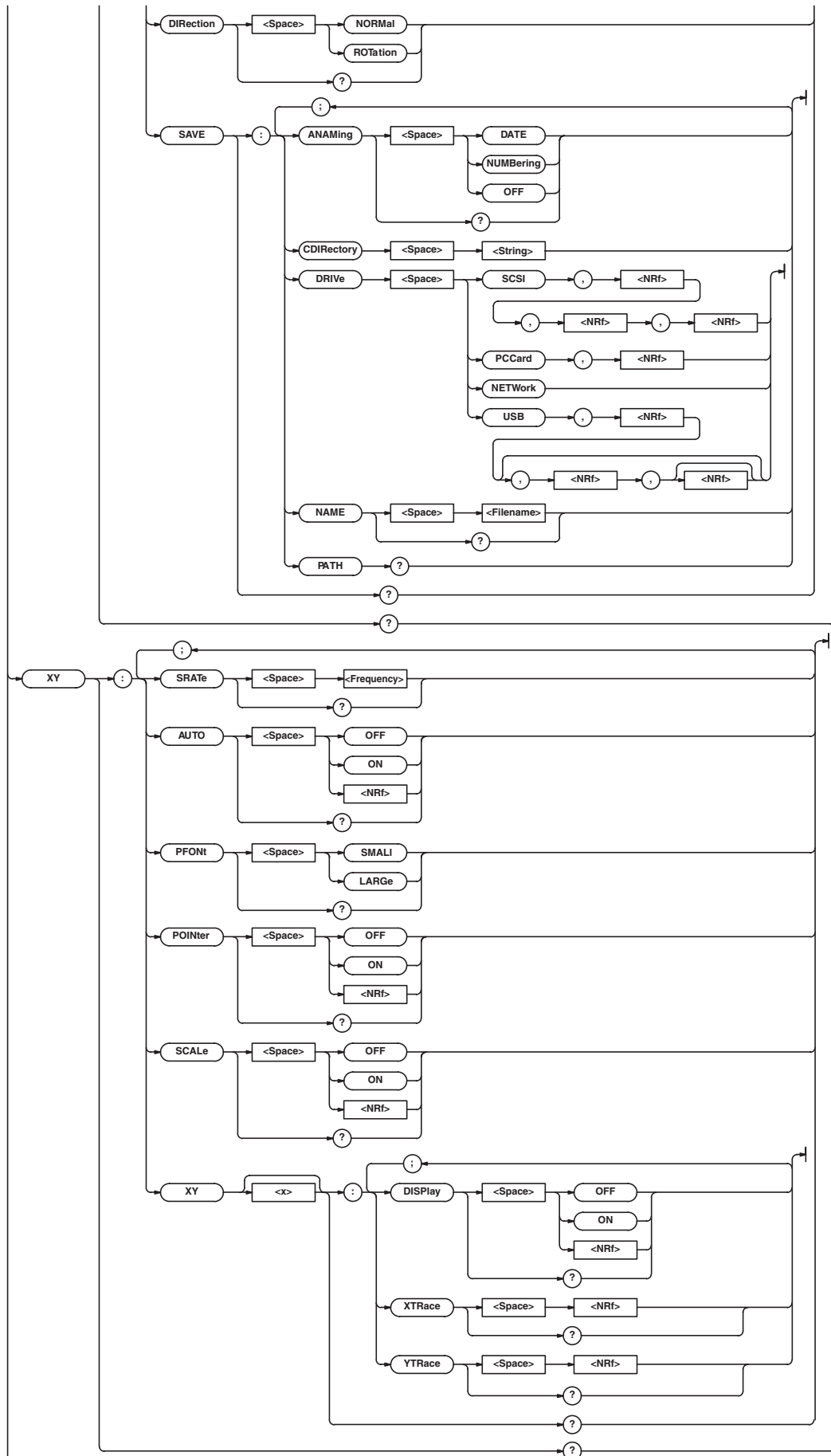
Example :MTRIGGER

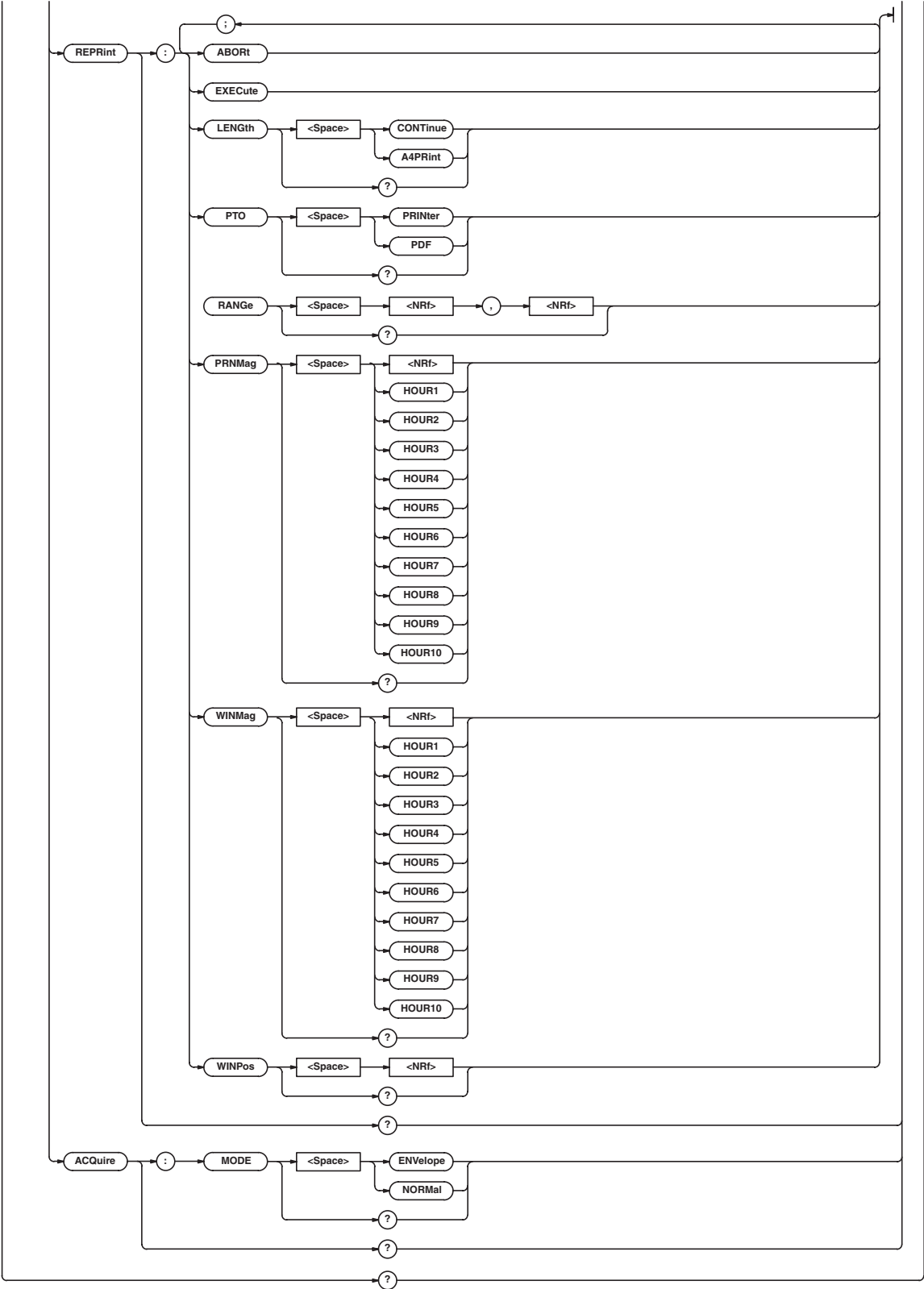
6.21 RERecorder Group

The commands in this group deal with realtime recording on the built-in printer. You can make the same settings, execute the same operations, and make the same inquiries as when you select Recorder mode or X-Y Recorder mode using the MODE key on the front panel.



6.21 RECorder Group





6.21 REcorder Group

:REcorder?

Function Queries all settings related to the recorder mode.

Syntax :REcORDER?

Example :REcORDER? -> :REcORDER:MODE OFF;
CHART:PSTYLE WAVE;CSPEED PS10;
SHOT OFF;PRINTEROUT 1;
OUTDEVICE CHART;INTERVAL 1.000E+00;
DIRECTION NORMAL;SAVE:
ANAMING NUMBERING;NAME " ";:
REcORDER:XY:SRATE 1.0E+06;AUTO 1;
SCALE 1; POINTER 0;XY:DISPLAY 1;
XTRACE 1;YTRACE 2;:REC:XY:XY2:
DISPLAY 0;XTRACE 1;YTRACE 15;:
REC:XY:XY3:DISPLAY 0;XTRACE 15;
YTRACE 1;:REC:XY:XY4:DISPLAY 0;
XTRACD $\sqrt{5}$;YTRACE 15;:
REcORDER:REPRINT:PTO PRINTER;
RANG -5.0000000,5.0000000;
PRNMAG 500.0E-06;WINMAG 500.0E-06;
WINPOS 5.01:REcORDER:ACQUIRE:
MODE ENVELOPE

:REcorder:ACquire?

Function Queries all settings related to the waveform acquisition for Chart Recorder mode.

Syntax :REcORDER:ACquire?

Example :REcORDER:ACQUIRE? ->
:REcORDER:ACQUIRE:MODE ENVELOPE

:REcorder:ACquire:MODE

Function Sets the waveform acquisition mode for Chart Recorder mode or queries the current setting.

Syntax :REcORDER:ACquire:MODE {ENVELOPE:
NORMAL}

Example :REcORDER:ACQUIRE:MODE ENVELOPE
:REcORDER:ACQUIRE:MODE? ->
:REcORDER:ACQUIRE:MODE ENVELOPE

:REcorder:MODE

Function Sets the recorder mode or queries the current setting.

Syntax :REcORDER:MODE {CHARTrec|XYRec|
OFF}

Example :REcORDER:MODE CHARTREC
:REcORDER:MODE? -> :REcORDER:
MODE CHARTREC

:REcorder:CHART?

Function Queries all settings related to Chart Recorder mode.

Syntax :REcORDER:CHART?

Example :REcORDER:CHART? ->
:REcORDER:CHART:PSTYLE WAVE;
CSPEED PS10;SHOT OFF;PRINTEROUT 1;
OUTDEVICE CHART;INTERVAL 1.000E+00;
DIRECTION NORMAL;SAVE:ANAMING DATE;
NAME "CHART"

:REcorder:CHART:PSTYLE

Function Sets the print style for Chart Recorder mode or queries the current setting.

Syntax :REcORDER:CHART:PSTYLE {WAVE|
NUMERIC}

Example :REcORDER:CHART:PSTYLE
:REcORDER:CHART:PSTYLE WAVE
:REcORDER:CHART:PSTYLE? ->
:REcORDER:CHART:PSTYLE WAVE

:REcorder:CHART:CSpeed

Function Sets the chart speed for Chart Recorder mode or queries the current setting.

Syntax :REcORDER:CHART:CSpeed
{PS20|PS10|PS5|PS2|PS1|PM100|PM50|
PM25|PM20|PM10|PM5|PM2|PM1|PH100|
PH50|PH25|PH20|PH10}

Example :REcORDER:CHART:CSpeed?
:REcORDER:CHART:CSPEED PS20
:REcORDER:CHART:CSPEED? ->
:REcORDER:CHART:CSPEED PS20

:REcorder:CHART:SHOT

Function Sets the shot recording for Chart Recorder mode or queries the current setting.

Syntax :REcORDER:CHART:SHOT {M2|M1|CM50|
CM20|OFF}

Example :REcORDER:CHART:SHOT?
:REcORDER:CHART:SHOT M2
:REcORDER:CHART:SHOT? ->
:REcORDER:CHART:SHOT M2

:REcorder:CHART:PRINTERout

Function Turns ON/OFF the chart recording for T-Y recording in Chart Recorder mode or queries the current setting.

Syntax :REcORDER:CHART:
PRINTERout {<Boolean>}

Example :REcORDER:CHART:PRINTERout?
:REcORDER:CHART:PRINTEROUT ON
:REcORDER:CHART:PRINTEROUT? ->
:REcORDER:CHART:PRINTEROUT 1

:REcorder:CHART:OUTDevice

Function Sets the output destination device for numeric value recording in Chart Recorder mode or queries the current setting.

Syntax :REcORDER:CHART:OUTDevice {CHART|
FILE}

Example :REcORDER:CHART:OUTDevice?
:REcORDER:CHART:OUTDEVICE CHART
:REcORDER:CHART:OUTDEVICE? ->
:REcORDER:CHART:OUTDEVICE CHART

:REcorder:CHART:INTERval

Function Sets the recording interval for numeric value recording in Chart Recorder mode or queries the current setting.

Syntax :REcORDER:CHART:INTERval {<Time>}

Example :REcORDER:CHART:INTERval?
<Time>=1 s to 3600 s
:REcORDER:CHART:INTERVAL 3600
:REcORDER:CHART:INTERVAL? ->
:REcORDER:CHART:INTERVAL 3.600E+03

:REcorder:CHART:DIREction

Function	Sets the print direction for numeric value recording in Chart Recorder mode or queries the current setting.
Syntax	<code>:REcorder:CHART:DIREction {NORMAL ROTation}</code> <code>:REcorder:CHART:DIREction?</code>
Example	<code>:REcORDER:CHART:DIRECTION NORMAL</code> <code>:REcORDER:CHART:DIRECTION? -></code> <code>:REcORDER:CHART:DIRECTION NORMAL</code>

:REcorder:CHART:SAVE?

Function	Queries all settings related to the saving of the numeric recording in Chart Recorder mode to the storage medium.
Syntax	<code>:REcorder:CHART:SAVE?</code>
Example	<code>:REcORDER:CHART:SAVE? -></code> <code>:REcORDER:CHART:SAVE:ANAMING DATE;</code> <code>NAME "CHART"</code>

:REcorder:CHART:SAVE:ANAMing

Function	Sets the auto naming function of the saved files or queries the current setting.
Syntax	<code>:REcorder:CHART:SAVE:ANAMing {DATE NUMBERing OFF}</code> <code>:REcorder:CHART:SAVE:ANAMing?</code>
Example	<code>:REcORDER:CHART:SAVE:</code> <code>ANAMING NUMBERING</code> <code>:REcORDER:CHART:SAVE:ANAMING? -></code> <code>:REcORDER:CHART:SAVE:</code> <code>ANAMING NUMBERING</code>

:REcorder:CHART:SAVE:CDIREctory

Function	Changes the save destination directory.
Syntax	<code>:REcorder:CHART:SAVE:</code> <code>CDIREctory <String></code> <code><String>=Up to 16 characters</code>
Example	<code>:REcORDER:CHART:SAVE:</code> <code>CDIRECTORY "CHART"</code>

:REcorder:CHART:SAVE:DRIVE

Function	Sets the save destination storage medium.
Syntax	<code>:REcorder:CHART:SAVE:DRIVE</code> <code>{SCSI,<NRf>{,<NRf>} PCCard,{<NRf>} </code> <code>NETWork USB,<NRf>{,<NRf>}{,<NRf>}</code> <code><NRf> of PCCard = Partitions (0 to 3)</code> <code>The first <NRf> of USB = USB address</code> <code>The second <NRf> of USB = Partition (0 to 3) or</code> <code>LUN (logical unit number: 0 to 3)</code> <code>The third <NRf> of USB = Partition (0 to 3)</code> <code>when LUN is specified in the second <NRf></code>
Example	<code>:REcORDER:CHART:SAVE:DRIVE SCSI,4,1</code>
Description	- If the drive does not contain partitions, omit the <NRf> corresponding to partitions. "NETWork" can be used when the Ethernet interface (option) is installed. - The second or third <NRf> when USB is selected can be omitted if the drive is not partitioned or divided by LUN.

:REcorder:CHART:SAVE:NAME

Function	Sets the name of the file to be saved or queries the current setting.
Syntax	<code>:REcorder:CHART:SAVE:</code> <code>NAME <Filename></code> <code>:REcorder:CHART:SAVE:NAME?</code>
Example	<code>:REcORDER:CHART:SAVE:NAME "CHART_1"</code> <code>:REcORDER:CHART:SAVE:NAME? -></code> <code>:REcORDER:CHART:SAVE:NAME "CHART_1"</code>

:REcorder:CHART:SAVE:PATH?

Function	Queries the current directory.
Syntax	<code>:REcorder:CHART:SAVE:PATH?</code>
Example	<code>:REcORDER:CHART:SAVE:PATH?</code> <code>:REC:CHAR:SAVE:</code> <code>PATH "Path=PC_Card_CHART"</code>

:REcorder:XY?

Function	Queries all settings related to the X-Y recorder mode.
Syntax	<code>:REcORDER:XY?</code>
Example	<code>:REcORDER:XY? -> :REcORDER:XY:</code> <code>SRATE 1.0E+06;AUTO 1;SCALE 1;</code> <code>POINTER 0XY:DISPLAY 1;XTRACE 1;</code> <code>YTRACE 2;;REcORDER:XY:XY2:</code> <code>DISPLAT 0;XTRACE 1;YTRACE 15;;</code> <code>REcORDER:XY:XY3:DISPLAY 0;</code> <code>XTRACE 15;YTRACE 1;;REcORDER:</code> <code>XY:XY4:DISPLAT 0;XTRACE 15;</code> <code>YTRACE 15</code>

:REcorder:XY:AUTO

Function	Turns ON/OFF auto print for X-Y recorder mode or queries the current setting.
Syntax	<code>:REcorder:XY:AUTO {<Boolean>}</code> <code>:REcorder:XY:AUTO?</code>
Example	<code>:REcORDER:XY:AUTO ON</code> <code>:REcORDER:XY:AUTO? -></code> <code>:REcORDER:XY:AUTO 1</code>

:REcorder:XY:PFONT

Function	Sets the size of the printed characters for X-Y recorder mode or queries the current setting.
Syntax	<code>:REcorder:XY:PFONT {SMALL LARGE}</code> <code>:REcorder:XY:PFONT?</code>
Example	<code>:REcORDER:XY:PFONT LARGE</code> <code>:REcORDER:XY:PFONT? -></code> <code>:REcORDER:XY:PFONT LARGE</code>

:REcorder:XY:POINter

Function	Turns ON/OFF the pointer indicating the most recent point for X-Y recorder mode or queries the current setting.
Syntax	<code>:REcorder:XY:POINter {<Boolean>}</code> <code>:REcorder:XY:POINter?</code>
Example	<code>:REcORDER:XY:POINter ON</code> <code>:REcORDER:XY:POINter? -></code> <code>:REcORDER:XY:POINter 1</code>

:REcorder:XY:SCALE

Function	Turns ON/OFF the scale for X-Y recorder mode or queries the current setting.
Syntax	<code>:REcorder:XY:SCALE {<Boolean>}</code> <code>:REcorder:XY:SCALE?</code>
Example	<code>:REcORDER:XY:SCALE ON</code> <code>:REcORDER:XY:SCALE? -></code> <code>:REcORDER:XY:SCALE 1</code>

6.21 RERecorder Group

:RERecorder:XY:SRATE

Function Sets the sample rate for X-Y recorder mode or queries the current setting.

Syntax :RERecorder:XY:SRATE {<Frequency>}
:RERecorder:XY:SRATE?

<Frequency>=5 Hz, 10 Hz, 20 Hz, 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz

Example :RECORDER:XY:SRATE 50
:RECORDER:XY:SRATE? ->
:RECORDER:XY:SRATE 50.0E+00

:RERecorder:XY:XY<x>?

Function Queries all settings of the XY waveform for X-Y recorder mode.

Syntax :RERecorder:XY:XY<x>?
<x> of XY<x>=1 to 4

Example :RECORDER:XY:XY2? ->
:RECORDER:XY:XY2:DISPLAY 0;
XTRACE 1;YTRACE 9

:RERecorder:XY:XY<x>:DISPLAY

Function Turns ON/OFF the XY waveform for X-Y recorder mode or queries the current setting.

Syntax :RERecorder:XY:XY<x>:
DISPLAY {<Boolean>}
:RERecorder:XY:XY<x>:DISPLAY?
<x> of XY<x>=1 to 4

Example :RECORDER:XY:XY2:DISPLAY ON
:RECORDER:XY:XY2:DISPLAY? ->
:RECORDER:XY:XY2:DISPLAY 1

:RERecorder:XY:XY<x>:XTRace

Function Sets the channel to be assigned to the X-axis of the XY waveform for X-Y recorder mode or queries the current setting.

Syntax :RERecorder:XY:XY<x>:XTRace {<Nrf>}
:RERecorder:XY:XY<x>:XTRace?
<x> of XY<x>=1 to 4
<Nrf>=1 to 16

Example :RECORDER:XY:XY2:XTRACE 1
:RECORDER:XY:XY2:XTRACE? ->
:RECORDER:XY:XY2:XTRACE 1

Description There is a limitation on the channels that can be specified.

:RERecorder:XY:XY<x>:YTRace

Function Sets the channel to be assigned to the Y-axis of the XY waveform for X-Y recorder mode or queries the current setting.

Syntax :RERecorder:XY:XY<x>:YTRace {<Nrf>}
:RERecorder:XY:XY<x>:YTRace?
<x> of XY<x>=1 to 4
<Nrf>=1 to 16

Example :RECORDER:XY:XY2:YTRACE 15
:RECORDER:XY:XY2:YTRACE? ->
:RECORDER:XY:XY2:YTRACE 15

Description There is a limitation on the channels that can be specified.

:RERecorder:REPrint?

Function Queries all settings related to reprinting.

Syntax :RERecorder:REPrint?

Example :RECORDER:REPRINT? ->
:RECORDER:REPRINT:PTO PRIN;
RANGE -5.0000000,5.0000000;
PRNMAG 1.000E+00;WINMAG 1.000E+00;
WINPOS 0.00

:RERecorder:REPrint:ABORT

Function Aborts reprinting or paper feeding.

Syntax :RERecorder:REPrint:ABORT

Example :RECORDER:REPRINT:ABORT

:RERecorder:REPrint:EXECute

Function Executes reprinting. This is an overlap command.

Syntax :RERecorder:REPrint:EXECute

Example :RECORDER:REPRINT:EXECUTE

:RERecorder:REPrint:LENGTH

Function Sets the print length of the section to be reprinted or queries the current setting.

Syntax :RERecorder:REPrint:
LENGTH {CONTINUE|A4Print}
:RERecorder:REPrint:LENGTH?
Example :RECORDER:REPRINT:LENGTH CONTINUE
:RECORDER:REPRINT:LENGTH? ->
:RECORDER:REPRINT:LENGTH CONTINUE

:RERecorder:REPrint:PTO

Function Sets the output destination for reprinting or queries the current setting.

Syntax :RERecorder:REPrint:PTO {PRINTER | PDF}

Example :RECORDER:REPRINT:PTO PDF
:RECORDER:REPRINT:PTO? ->
:RECORDER:REPRINT:PTO PDF

:RERecorder:REPrint:RANGE

Function Sets the range to be reprinted (start and end points) or queries the current setting.

Syntax :RERecorder:REPrint:
RANGE {<Nrf>},{<Nrf>}
:RERecorder:REPrint:RANGE?
<Nrf>=-5.00 to 5.00

Example :RECORDER:REPRINT:RANGE 3.00,-3.00
:RECORDER:REPRINT:RANGE? ->
:RECORDER:REPRINT:
RANGE -3.0000000,3.0000000

:RERecorder:REPrint:PRNMag

Function Sets the waveform magnification for reprinting or queries the current setting.

Syntax :RERecorder:REPrint:PRNMag {<Time> | HOUR1 | HOUR2 | HOUR3 | HOUR4 | HOUR5 | HOUR6 | HOUR7 | HOUR8 | HOUR9 | HOUR10}

Example :RECORDER:REPRINT:PRNMAG 200MS
:RECORDER:REPRINT:PRNMAG? ->
:RECORDER:REPRINT:PRNMAG 200.0E-03

Description There is a limitation on the value that can be specified depending on the specified Window Mag setting.

:REcorder:REPRint:WINMag

Function	Sets the magnification of the section to be reprinted or queries the current setting.
Syntax	<code>:REcorder:REPRint:WINMag {<Time> HOUR1 HOUR2 HOUR3 HOUR4 HOUR5 HOUR6 HOUR7 HOUR8 HOUR9 HOUR10} :REcorder:REPRint:WINMag? <Time>=200 ms to 30000 s</code>
Example	<code>:REcorder:REPRint:WINMAG HOUR1 :REcorder:REPRint:WINMAG? -> :REcorder:REPRint:WINMAG HOUR1</code>

:REcorder:REPRint:WINPos

Function	Sets the zoom position of the section to be reprinted or queries the current setting.
Syntax	<code>:REcorder:REPRint:WINPos {<Nrf>} :REcorder:REPRint:WINPos? <Nrf>= -5.00 or greater (div, 0.01 div steps)</code>
Example	<code>:REcorder:REPRint:WINPOS 5.00div :REcorder:REPRint:WINPOS? -> :REcorder:REPRint:WINPOS 5.00</code>
Description	There is a limitation on the value that can be specified depending on the specified Window Mag setting.

6.22 SNAP Group

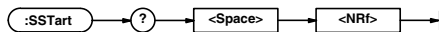
The command in this group is used to execute the snapshot. You can execute the same operation as the SNAP SHOT key on the front panel.

**:SNAP**

Function	Executes the snapshot.
Syntax	<code>:SNAP</code>
Example	<code>:SNAP</code>
Description	Clear trace is carried out using CLEar.

6.23 SStart Group

The commands in this group executes single start. Sets the trigger mode to Single and starts the waveform acquisition.

**:SStart (Single Start)**

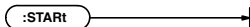
Function	Executes single start.
Syntax	<code>:SStart</code>
Example	<code>:SSTART</code>

:SStart?

Function	Executes single start and waits for the completion.
Syntax	<code>:SStart? {<Nrf>} <Nrf>=1 to 36000 (100 ms unit: wait time, START and wait) 0 (START only. No wait.) -36000 to -1 (100 ms resolution: wait period, START and wait)</code>
Example	<code>:SSTART? 100 -> :SSTART 0</code>
Description	- If the specified time period is positive, data acquisition is started in the SINGLE TRIGGER mode and waits for the operation to stop. - If the specified time period is 0, data acquisition is started and 0 is returned without waiting for the operation to stop. - If the specified time period is negative (-), the instrument simply waits for the operation to stop. Data acquisition is not started.

6.24 START Group

The command in this group is used to start the waveform acquisition. You can execute the same operation as the START/STOP key on the front panel.

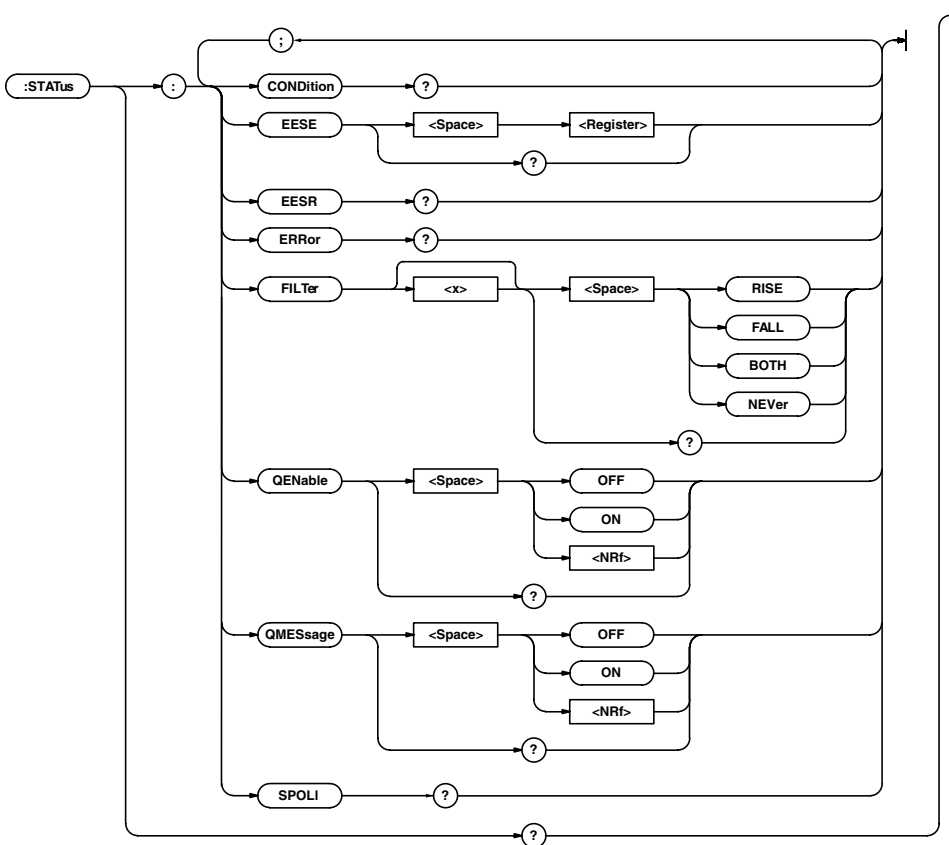


:START

Function	Starts the waveform acquisition.
Syntax	:START
Example	:START
Description	• Use STOP to stop the waveform acquisition. • To perform realtime recording, use the COMMunicate:OVERlap command to apply the overlap command for bit 6 (during file access) before starting/stopping.

6.25 STATus Group

The commands in this group are used to make settings and inquiries related to the status report. There are no front panel keys that correspond to the commands in this group. For details on the status report, see chapter 7.



:STATUS?

Function	Queries all settings related to the communication status function.
Syntax	:STATUS?
Example	<pre>:STATUS? -> :STATUS:EESR 0; FILTER1 NEVER;FILTER2 NEVER; FILTER3 NEVER;FILTER4 NEVER; FILTER5 NEVER;FILTER6 NEVER; FILTER7 NEVER;FILTER8 NEVER; FILTER9 NEVER;FILTER10 NEVER; FILTER11 NEVER;FILTER12 NEVER; FILTER13 NEVER;FILTER14 NEVER; FILTER15 NEVER;FILTER16 NEVER; QENABLE 0;QMESSAGE 1</pre>

:STATUS:CONDition?

Function	Queries the contents of the condition register.
Syntax	:STATUS:CONDition?
Example	:STATUS:CONDITION? -> 16
Description	For the description regarding how to synchronize the program using :STATUS:CONDition, see page 5-8.

:STATUS:EES (Extended Event Status Enable register)

Function Sets the extended event enable register or queries the current setting.

Syntax :STATUS:EES <Register>
:STATUS:EES?

Example :STATUS:EES #0 to 65535
:STATUS:EES? -> :STATUS:EES 0

:STATUS:EESR? (Extended Event Status Register)

Function Queries the content of the extended event register and clears the register.

Syntax :STATUS:EESR?

Example :STATUS:EESR? -> 0

:STATUS:ERROR?

Function Queries the error code and message information (top of the error queue).

Syntax :STATUS:ERROR?

Example :STATUS:ERROR? -> 901, "Backup failure"

Description

- When there is no error, 0 (No error) is returned.
- The message cannot be returned in Japanese.
- You can specify whether or not to add the message using the "STATUS:QMESSAGE" command.

:STATUS:FILTER<x>

Function Sets the transition filter or queries the current setting.

Syntax :STATUS:FILTER<x>
{RISE | FALL | BOTH | NEVER}
:STATUS:FILTER<x>?
<x>=1 to 16

Example :STATUS:FILTER2 RISE
:STATUS:FILTER2? -> :STATUS:
FILTER2 RISE

Description Specify how each bit of the condition register is to change to set the event. If RISE is specified, the event is set when the bit changes from 0 to 1.

:STATUS:QENable

Function Sets whether or not to store messages other than errors to the error queue (ON/OFF) or queries the current setting.

Syntax :STATUS:QENable {<Boolean>}
:STATUS:QENable?

Example :STATUS:QENABLE ON
:STATUS:QENABLE? -> :STATUS:
QENABLE 1

:STATUS:QMESSAGE

Function Sets whether or not to attach message information to the response to the STATUS:ERROR? query (ON/OFF) or queries the current setting.

Syntax :STATUS:QMESSAGE {<Boolean>}
:STATUS:QMESSAGE?

Example :STATUS:QMESSAGE ON
:STATUS:QMESSAGE? ->
:STATUS:QMESSAGE 1

:STATUS:SPOLL? (Serial Poll)

Function Executes serial polling.

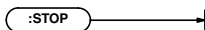
Syntax :STATUS:SPOLL?

Example :STATUS:SPOLL? -> :STATUS:SPOLL 0

Description This command is dedicated to the RS-232 interface. For GP-IB, this function is provided as an interface message.

6.26 STOP Group

The command in this group is used to stop the waveform acquisition. You can execute the same operation as the START/STOP key on the front panel.

**:STOP**

Function Stops the waveform acquisition.

Syntax :STOP

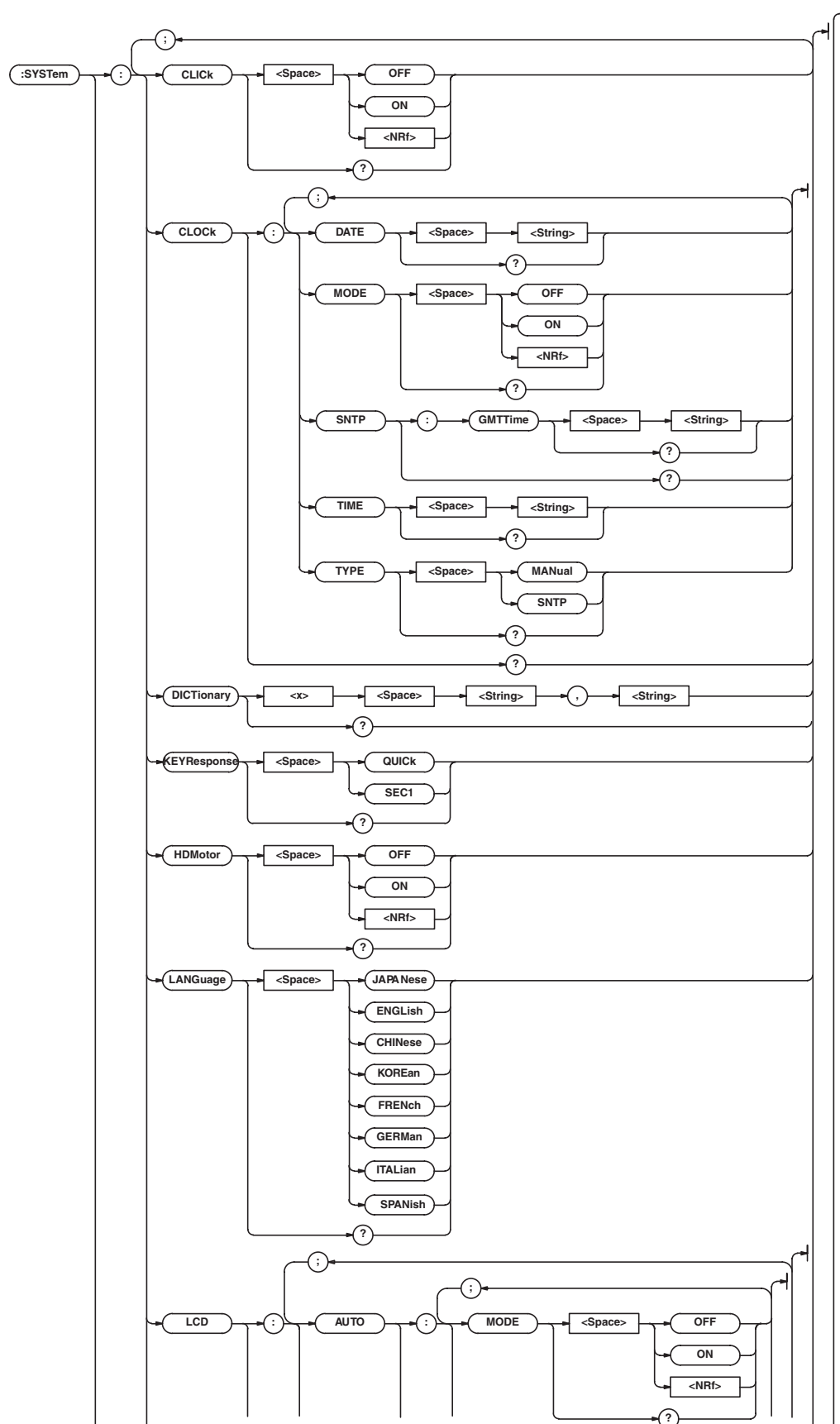
Example :STOP

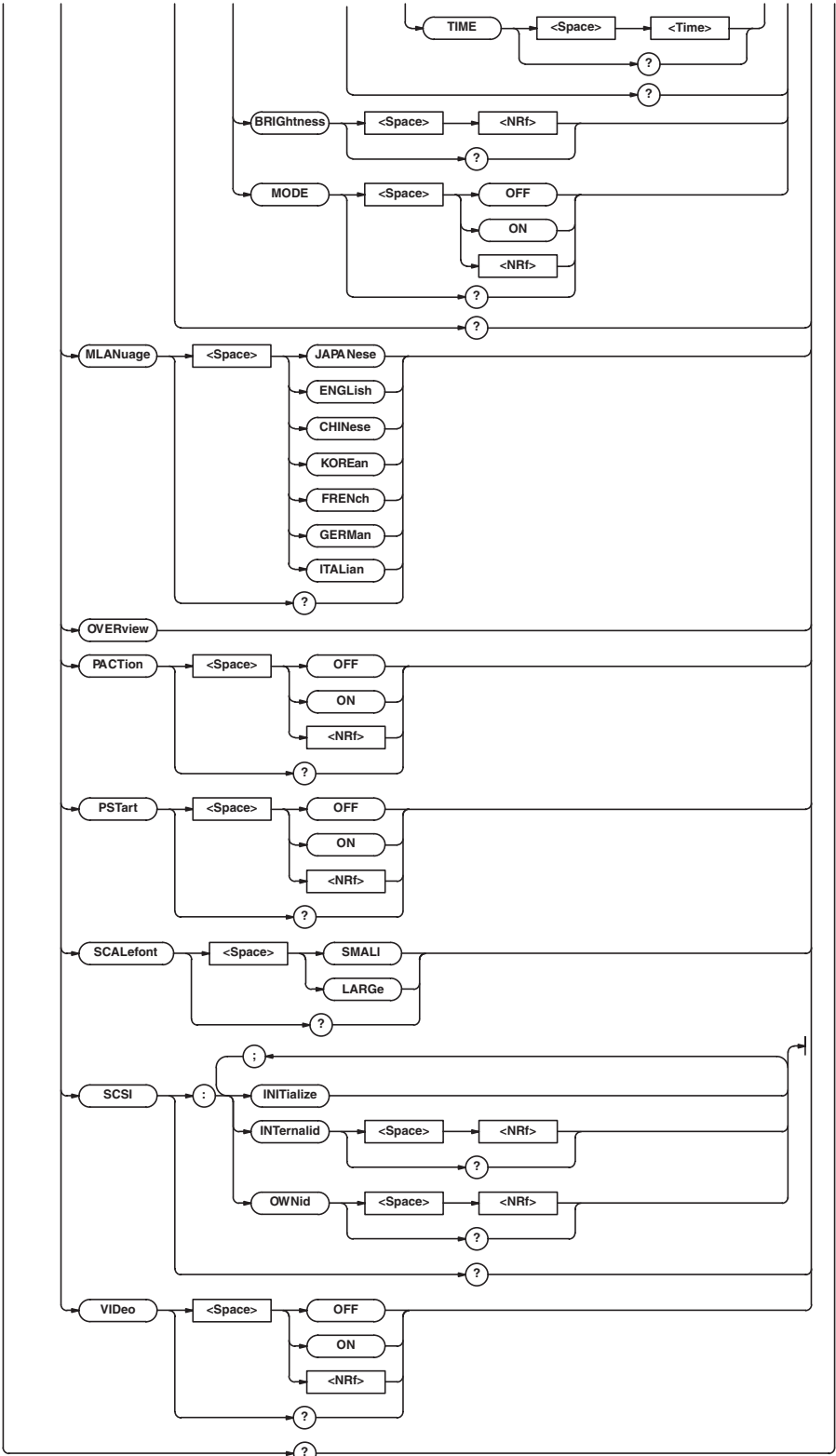
Description

- Use START to start the waveform acquisition.
- To perform realtime recording, use the COMMUNICATE:OVERLAP command to apply the overlap command for bit 6 (during file access) before starting/stopping.

6.27 SYSTem Group

The commands in this group deal with the system. You can make the same settings and inquiries as when you press the MENU key > System Config soft key on the front panel.





6.27 SYSTem Group

:SYSTem?

Function Queries all settings related to the system.
Syntax :SYSTem?
Example :SYSTem? -> :SYSTem:SCSI:
INTERNALID 4;OWNID 6;:SYSTem:CLOCK:
MODE 1;DATE "2002/06/07";
TIME "15:01:24";:SYSTem:
LANGUAGE JAPANESE;CLICK 1;
HDMOTOR 1;MLANUAGE ENGLISH;
PACTION 0;PSTART 0;
USBKEYBOARD JAPANESE;VIDEO 1;LCD:
MODE 1;BRIGHTNESS 4;AUTO:MODE 0;
TIME 1;:SYSTem:OCANCEL 0

:SYSTem:CLiCk

Function Turns ON/OFF the click sound or queries the current setting.
Syntax :SYSTem:CLiCk {<Boolean>}
:SYSTem:CLiCk?
Example :SYSTem:CLiCk ON
:SYSTem:CLiCk? -> :SYSTem:CLiCk 1

:SYSTem:CLOCK?

Function Queries all settings related to the date and time.
Syntax :SYSTem:CLOCK?
Example :SYSTem:CLOCK? -> :SYSTem:CLOCK:
MODE 1;DATE "2002/06/06";
TIME "16:37:50"

:SYSTem:CLOCK:DATE

Function Sets the date or queries the current setting.
Syntax :SYSTem:CLOCK:DATE <String>
:SYSTem:CLOCK:DATE?
<String>=YYYY/MM/DD, see the *User's Manual*
Example :SYSTem:CLOCK:DATE "2002/06/04"
:SYSTem:CLOCK:DATE? ->
:SYSTem:CLOCK:DATE "2002/06/04"

:SYSTem:CLOCK:MODE

Function Turns ON/OFF the date/time display or queries the current setting.
Syntax :SYSTem:CLOCK:MODE {<Boolean>}
:SYSTem:CLOCK:MODE?
Example :SYSTem:CLOCK:MODE ON
:SYSTem:CLOCK:MODE? ->
:SYSTem:CLOCK:MODE 1

:SYSTem:CLOCK:SNTP:GMTTime

Function Sets the time difference from GMT when using SNTP or queries the current setting.
Syntax :SYSTem:CLOCK:SNTP:GMTTime
{<String>}
:SYSTem:CLOCK:SNTP:GMTTime?
<String>=HH:MM (-12:00 to 12:00)
Example :SYSTem:CLOCK:SNTP:GMTTIME "09:00"
:SYSTem:CLOCK:SNTP:GMTTIME? ->
:SYSTem:CLOCK:SNTP:GMTTIME "09:00"

:SYSTem:CLOCK:TIME

Function Sets the time or queries the current setting.
Syntax :SYSTem:CLOCK:TIME <String>
:SYSTem:CLOCK:TIME?
<String>=HH:MM:SS, see the *User's Manual*
Example :SYSTem:CLOCK:TIME "14:30:00"
:SYSTem:CLOCK:TIME? ->
:SYSTem:CLOCK:TIME "14:30:00"

:SYSTem:CLOCK:TYPE

Function Sets whether to set the date/time manually or by using SNTP or queries the current setting.
Syntax :SYSTem:CLOCK:TYPE {MANual|SNTP}
:SYSTem:CLOCK:TYPE?
Example :SYSTem:CLOCK:TYPE MANUAL
:SYSTem:CLOCK:TYPE? ->
:SYSTem:CLOCK:TYPE MANUAL

:SYSTem:HDMotor

Function Turns ON/OFF the motor of the internal hard disk or queries the current setting.
Syntax :SYSTem:HDMotor {<Boolean>}
:SYSTem:HDMotor?
Example :SYSTem:HDMOTOR ON
:SYSTem:HDMOTOR? -> :SYSTem:
HDMOTOR 1
Description An error occurs if the internal hard disk (optional) is not installed.

:SYSTem:KEYResponse

Function Set or query the START/STOP key response time setting.
Syntax :SYSTem:KEYResponse {QUICK|SEC1}
:SYSTem:KEYResponse?
Example :SYSTem:KEYRESPONSE QUICK
:SYSTem:KEYRESPONSE? ->
:SYSTem:KEYRESPONSE QUICK

:SYSTem:LANGuage

Function Sets the message language or queries the current setting.
Syntax :SYSTem:LANGuage {ENGLISH|JAPANEse|
CHINEse|KOREan|FRENch|GERMan|ITALian|
SPANish}
:SYSTem:LANGuage?
Example :SYSTem:LANGUAGE JAPANESE
:SYSTem:LANGUAGE? -> :SYSTem:
LANGUAGE JAPANESE

:SYSTem:LCD?

Function Queries all settings related to the LCD.
Syntax :SYSTem:LCD?
Example :SYSTem:LCD? -> :SYSTem:LCD:MODE 1;
BRIGHTNESS 2;AUTO:MODE 0;TIME 1

:SYSTem:LCD:AUTO?

Function Queries all settings related to the auto off function of the LCD backlight.
Syntax :SYSTem:LCD:AUTO?
Example :SYSTem:LCD:AUTO? ->
:SYSTem:LCD:AUTO:MODE 0;TIME 1

:SYSTem:LCD:AUTO:MODE

Function Turns ON/OFF the auto off function of the LCD backlight or queries the current setting.
Syntax :SYSTem:LCD:AUTO:MODE {<Boolean>}
:SYSTem:LCD:AUTO:MODE?
Example :SYSTem:LCD:AUTO:MODE ON
:SYSTem:LCD:AUTO:MODE? ->
:SYSTem:LCD:AUTO:MODE 1

:SYSTem:LCD:AUTO:TIME

Function Sets the auto off time of the LCD backlight or queries the current setting.

Syntax `:SYSTem:LCD:AUTO:TIME {<NRf>}`
`:SYSTem:LCD:AUTO:TIME?`
`<NRf>=1 to 60 (minutes)`

Example `:SYSTEM:LCD:AUTO:TIME 1`
`:SYSTEM:LCD:AUTO:TIME? ->`
`:SYSTEM:LCD:AUTO:TIME 1`

:SYSTem:LCD:BRIGhtness

Function Sets the brightness of the LCD or queries the current setting.

Syntax `:SYSTem:LCD:BRIGhtness {<NRf>}`
`:SYSTem:LCD:BRIGhtness?`
`<NRf>=0 to 7`

Example `:SYSTEM:LCD:BRIGHTNESS 2`
`:SYSTEM:LCD:BRIGHTNESS? ->`
`:SYSTEM:LCD:BRIGHTNESS 2`

:SYSTem:LCD:MODE

Function Turns ON/OFF the LCD backlight or queries the current setting.

Syntax `:SYSTem:LCD:MODE {<Boolean>}`
`:SYSTem:LCD:MODE?`

Example `:SYSTEM:LCD:MODE OFF`
`:SYSTEM:LCD:MODE? ->`
`:SYSTEM:LCD:MODE 0`

:SYSTem:MLANguage

Function Sets the menu language or queries the current setting.

Syntax `:SYSTem:MLANguage {ENGLish|JAPANEse|CHINEse|KOREan}`
`:SYSTem:MLANguage?`

Example `:SYSTEM:MLANGUAGE JAPANESE`
`:SYSTEM:MLANGUAGE? -> :SYSTEM:MLANGUAGE JAPANESE`

:SYSTem:OVERview

Function Displays system information.

Syntax `:SYSTem:OVERview`

Example `:SYSTEM:OVERVIEW`

:SYSTem:PACTION

Function Sets whether to enable the action-on-trigger mode at power ON or queries the current setting.

Syntax `:SYSTem:PACTION {<Boolean>}`
`:SYSTem:PACTION?`

Example `:SYSTEM:PACTION ON`
`:SYSTEM:PACTION? -> :SYSTEM:PACTION 1`

:SYSTem:PStart

Function Sets whether to start the waveform acquisition at power ON or queries the current setting.

Syntax `:SYSTem:PStart {<Boolean>}`
`:SYSTem:PStart?`

Example `:SYSTEM:PSTART ON`
`:SYSTEM:PSTART? -> :SYSTEM:PSTART 1`

:SYSTem:SCALEfont

Function Sets the display size, large or small, of the scale values and waveform labels or queries the current setting.

Syntax `:SYSTem:SCALEfont {SMALL|LARGE}`
`:SYSTem:SCALEfont?`

Example `:SYSTEM:SCALEFONT SMALL`
`:SYSTEM:SCALEFONT? ->`
`:SYSTEM:SCALEFONT SMALL`

:SYSTem:SCSI?

Function Queries all settings related to the SCSI-ID.

Syntax `:SYSTem:SCSI?`

Example `:SYSTEM:SCSI? -> :SYSTEM:SCSI:INTERNALID 4;OWNID 6`

:SYSTem:SCSI:INITialize

Function Executes the changing of the SCSI-ID.

Syntax `:SYSTem:SCSI:INITialize`

Example `:SYSTEM:SCSI:INITIALIZE`

Description If you changed the SCSI-ID of the SL1400 using the “:SYSTem:SCSI:OWNid” command, make sure to issue this command.

:SYSTem:SCSI:INTernalid

Function Set the SCSI-ID of the internal hard disk or queries the current settings.

Syntax `:SYSTem:SCSI:INTernalid {<NRf>}`
`:SYSTem:SCSI:INTernalid?`
`<NRf>=0 to 7`

Example `:SYSTEM:SCSI:INTERNALID 4`
`:SYSTEM:SCSI:INTERNALID? ->`
`:SYSTEM:SCSI:INTERNALID 4`

:SYSTem:SCSI:OWNid

Function Set the SCSI-ID of the SL1400 or queries the current settings.

Syntax `:SYSTem:SCSI:OWNid {<NRf>}`
`:SYSTem:SCSI:OWNid?`
`<NRf>=0 to 7`

Example `:SYSTEM:SCSI:OWNID 7`
`:SYSTEM:SCSI:OWNID? ->`
`:SYSTEM:SCSI:OWNID 7`

:SYSTem:VIDeo

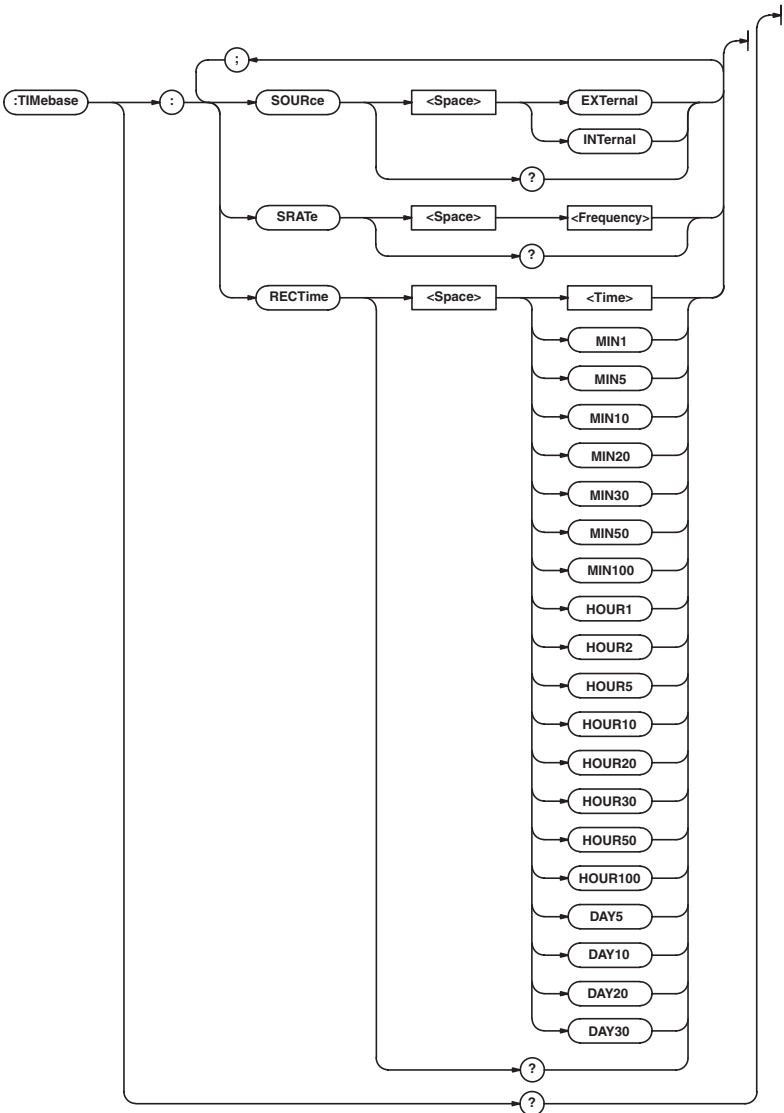
Function Turns ON/OFF the video output or queries the current setting.

Syntax `:SYSTem:VIDeo {<Boolean>}`
`:SYSTem:VIDeo?`

Example `:SYSTEM:VIDEO ON`
`:SYSTEM:VIDEO? -> :SYSTEM:VIDEO 1`

6.28 TIMEbase Group

The commands in this group deal with the time base. You can make the same settings and inquiries as when you use the TIME/DIV knob on the front panel.



:TIMEbase?

Function Queries all settings related to the time base.

Syntax :TIMEbase?

Example :TIMEBASE? -> :TIMEBASE:
SOURCE INTERNAL;SRATE 1.0E+06;
TDIV 1.000E-03

:TIMEbase:RECTime

Function Sets the record time or queries the current setting.

Syntax :TIMEbase:RECTime
{<Time>|MIN1|MIN5|MIN10|MIN20|
MIN30|MIN50|MIN100|HOUR1|HOUR2|
HOUR5|HOUR10|HOUR20|HOUR30|HOUR50|
HOUR100|DAY5|DAY10|DAY20|DAY30}
:TIMEbase:RECTime?
<Time> = 100 μ s to 1800 s

Example :TIMEBASE:RECTIME 10MS
:TIMEBASE:RECTIME? ->
:TIMEBASE:RECTIME 10.00E-03

:TIMEbase:SOURCE

Function Sets the time base or queries the current setting.

Syntax :TIMEbase:SOURCE {EXternal|
Internal}
:TIMEbase:SOURCE?

Example :TIMEBASE:SOURCE INTERNAL
:TIMEBASE:SOURCE? -> :TIMEBASE:
SOURCE INTERNAL

:TIMEbase:SRATE

Function Sets the sample rate or queries the current setting.

Syntax :TIMEbase:SRATE {<Frequency>}
:TIMEbase:SRATE?
<Frequency>=5 Hz, 10 Hz, 20 Hz, 50 Hz, 100
Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10
kHz, 20 kHz, 50 kHz, 100 kHz, 200 kHz, 500
kHz, 1 MHz, 2 MHz, 5 MHz, or 10 MHz

Example :TIMEBASE:SRATE 5
:TIMEBASE:SRATE? ->
:TIMEBASE:SRATE 5.0E+00

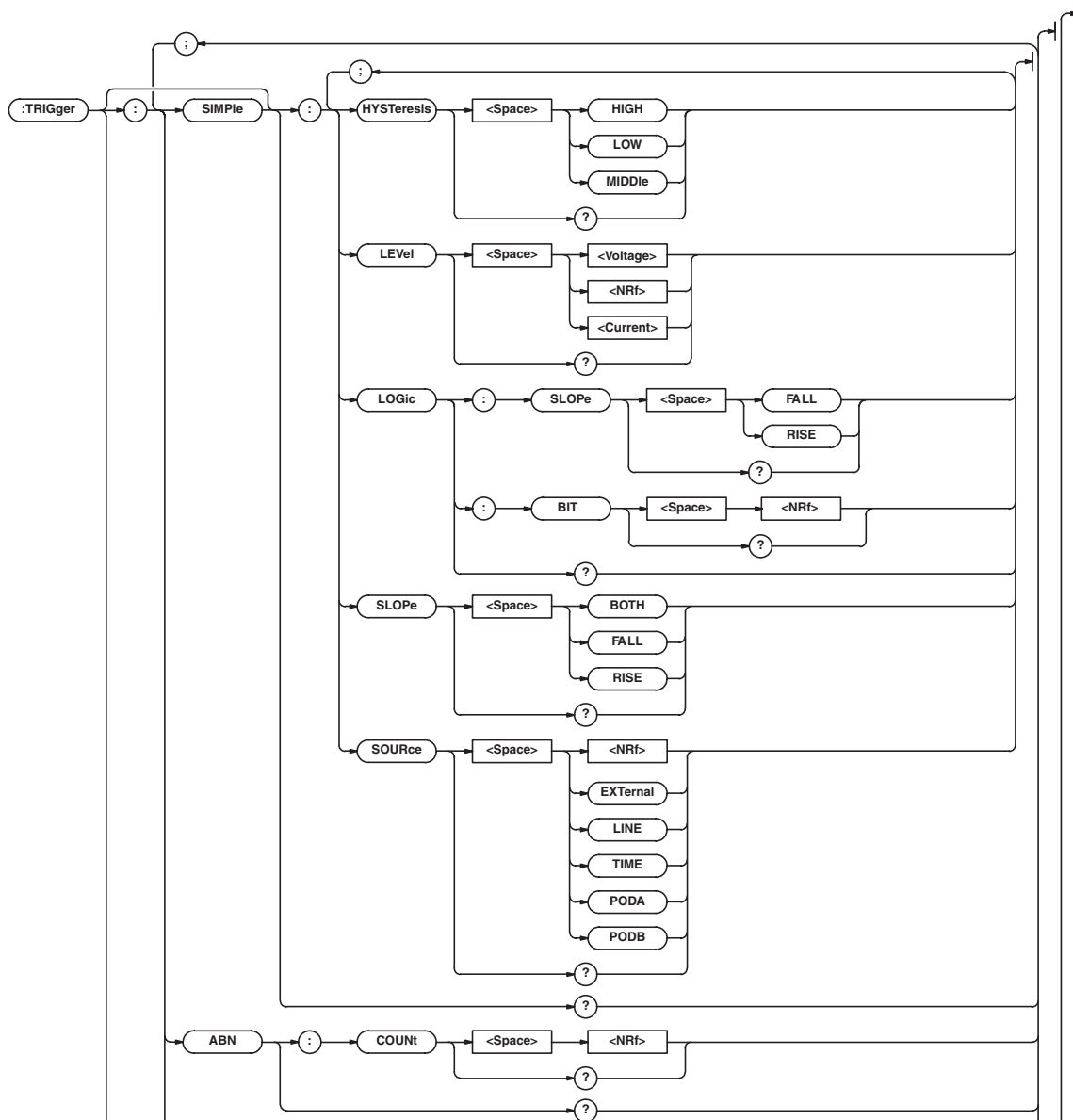
:TIMEbase:SRATE? (Sample RATE)

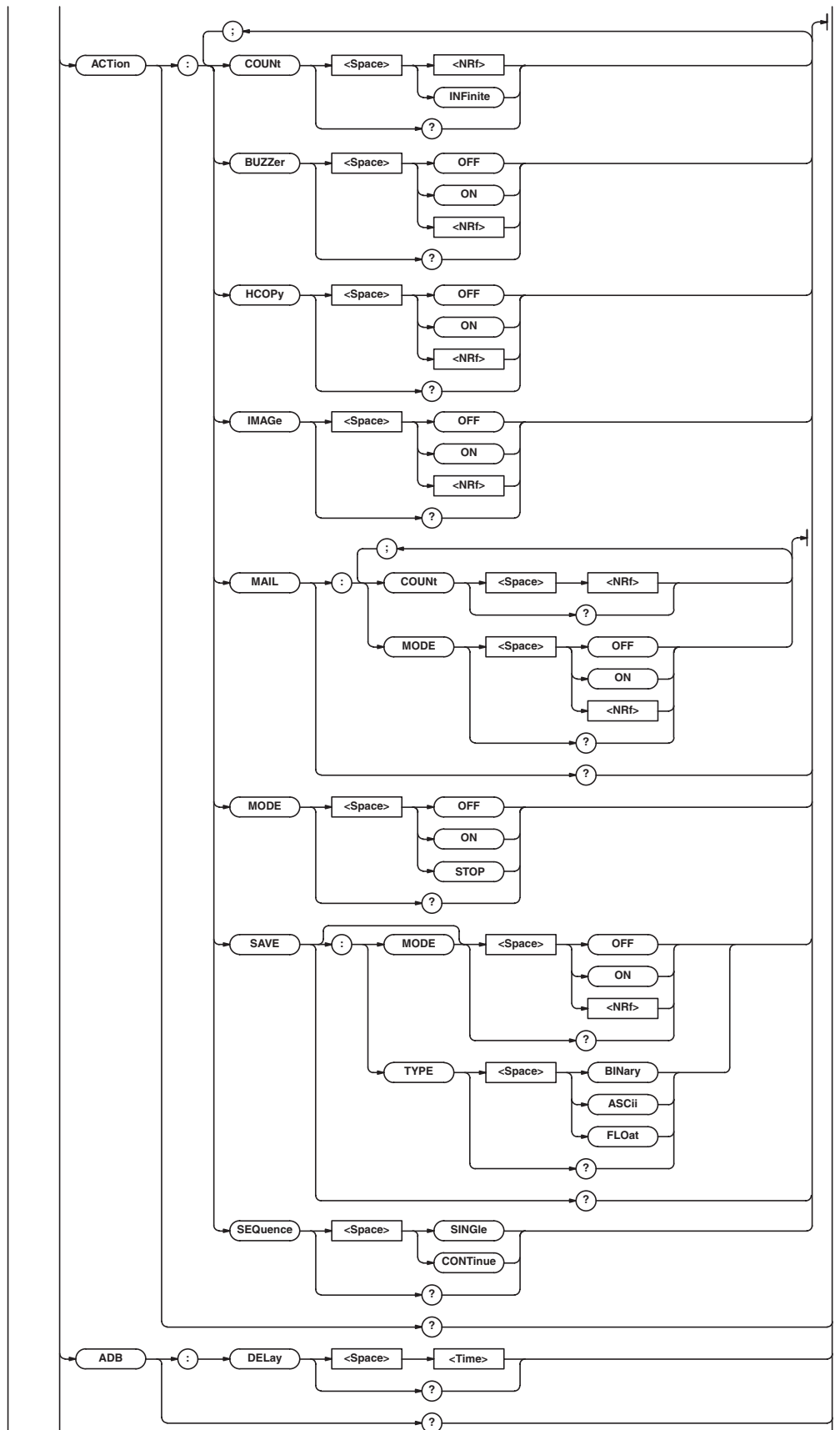
Function Queries the sample rate.

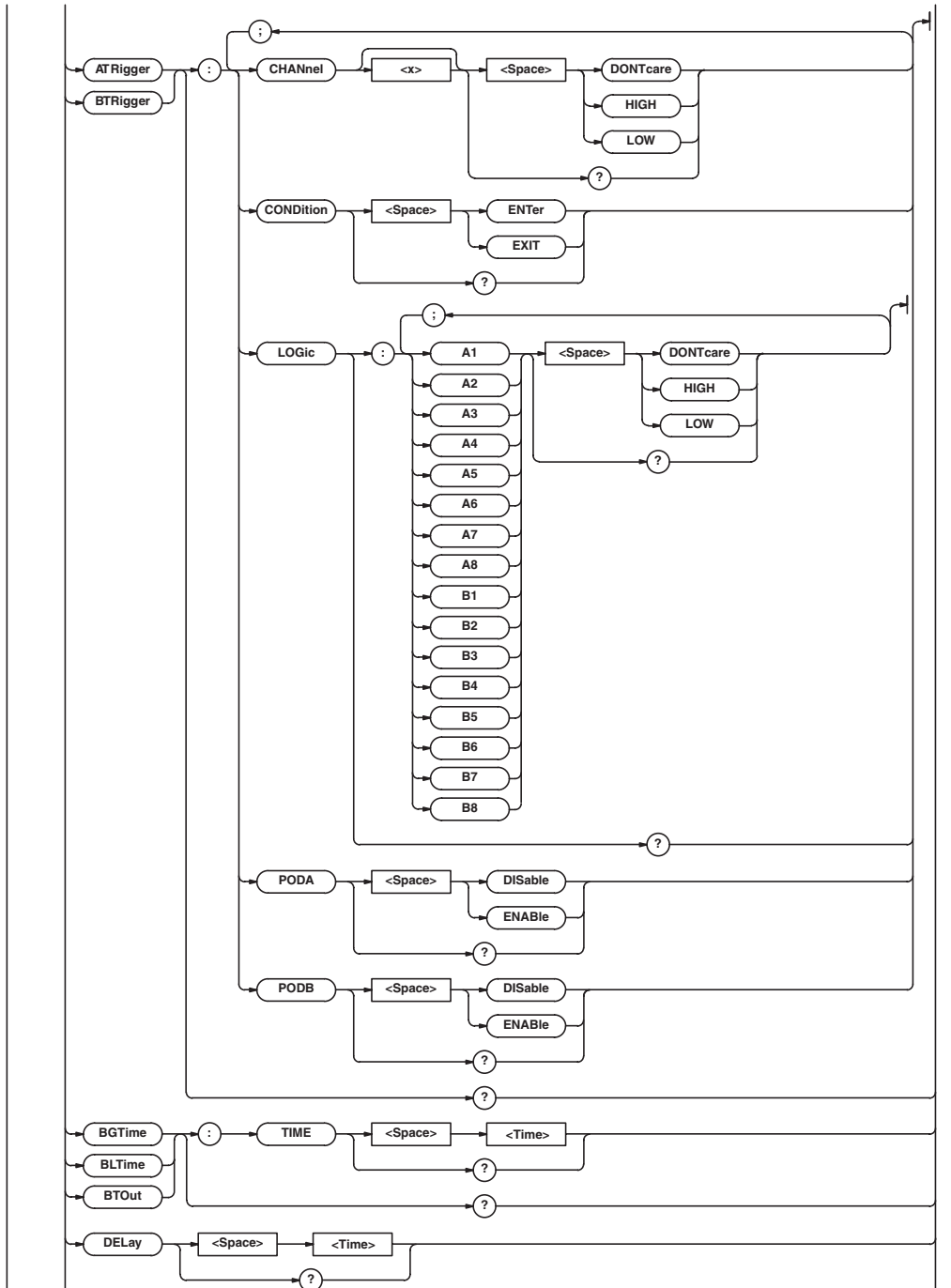
Syntax :TIMEbase:SRATE?

Example :TIMEBASE:SRATE? -> :TIMEBASE:
SRATE 10.0E+06**6.29 TRIGger Group**

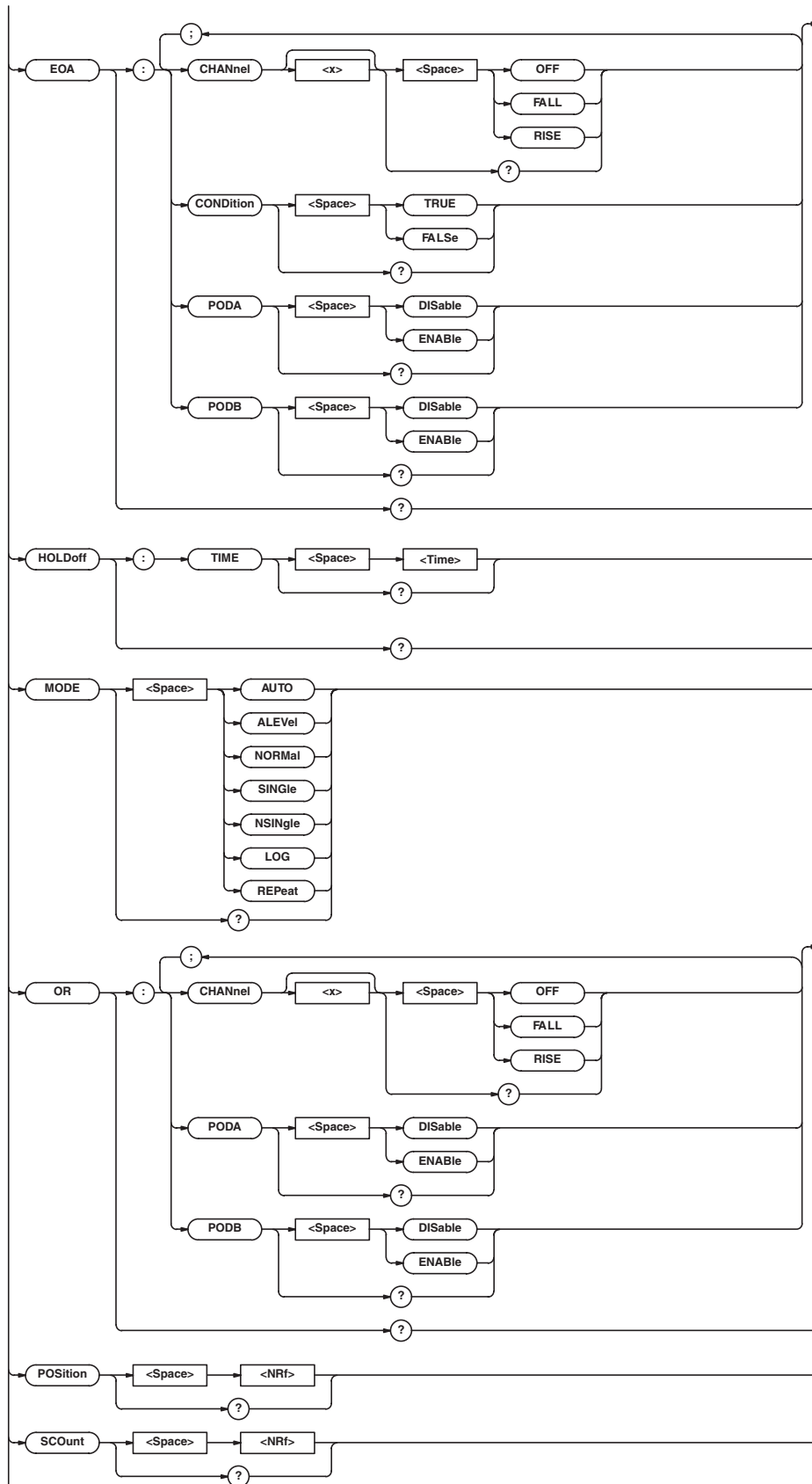
The commands in the trigger group deal with the trigger. You can make the same settings and inquiries as when you press the MENU key > TRIGGER soft key on the front panel.

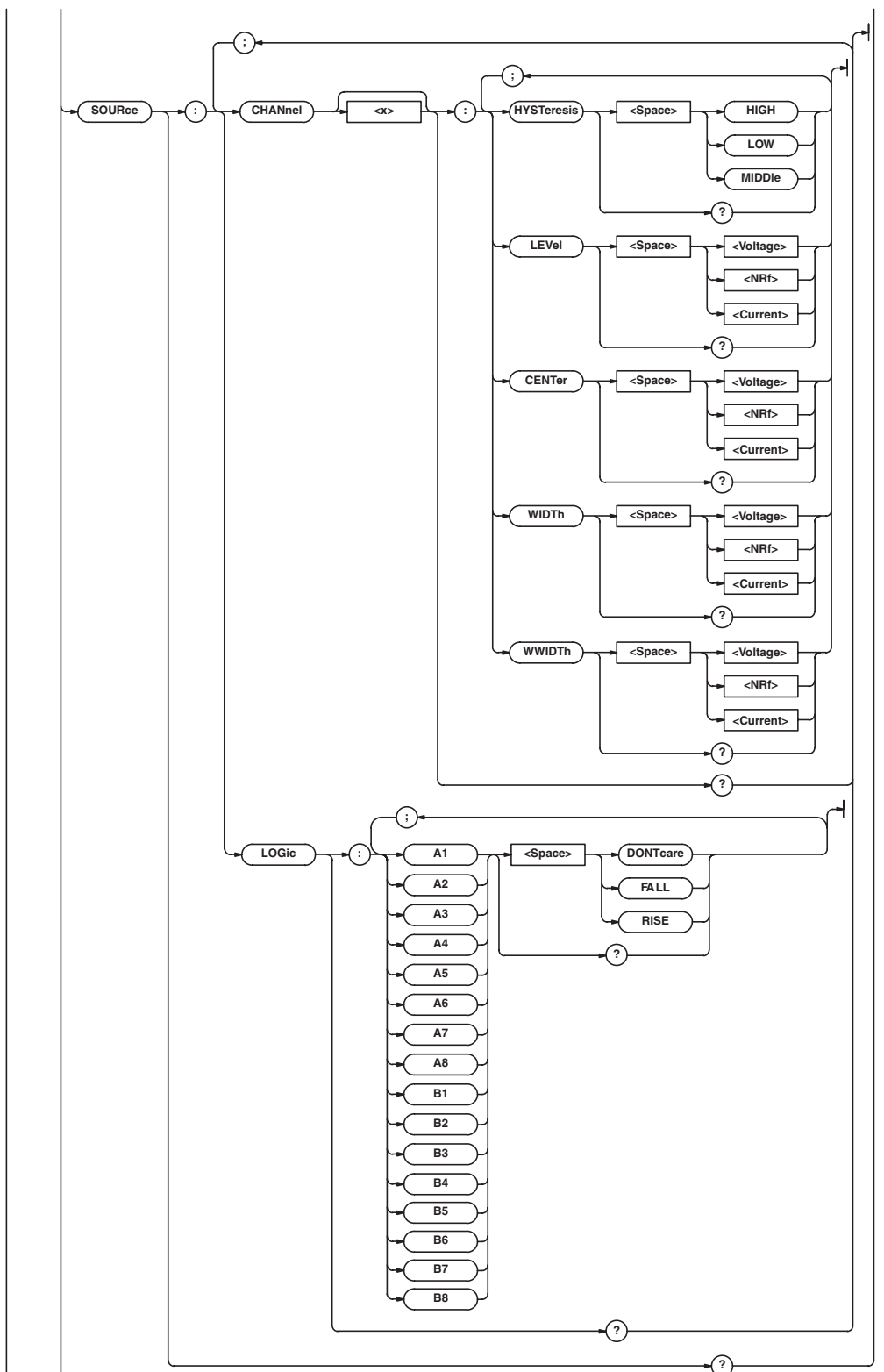




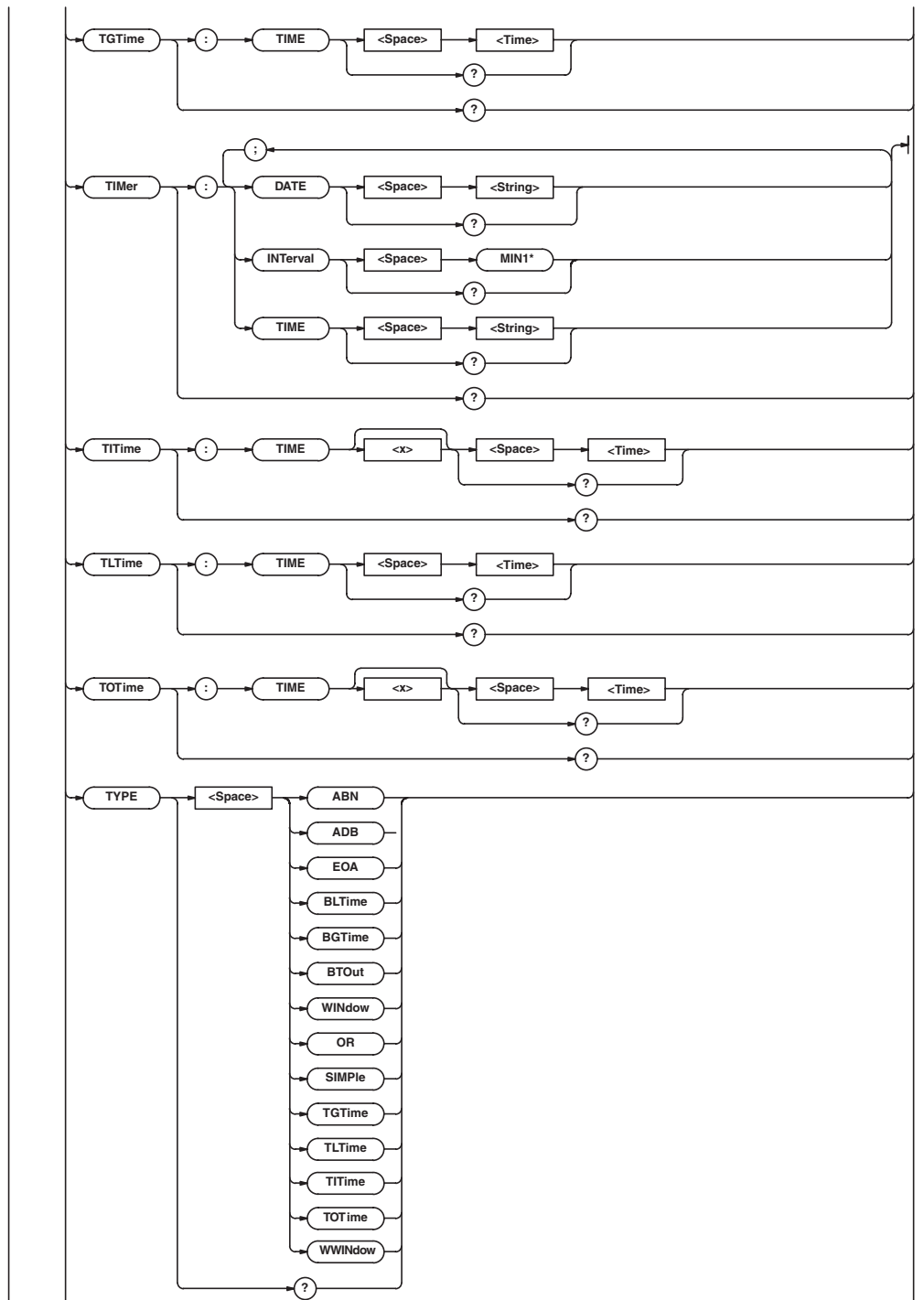


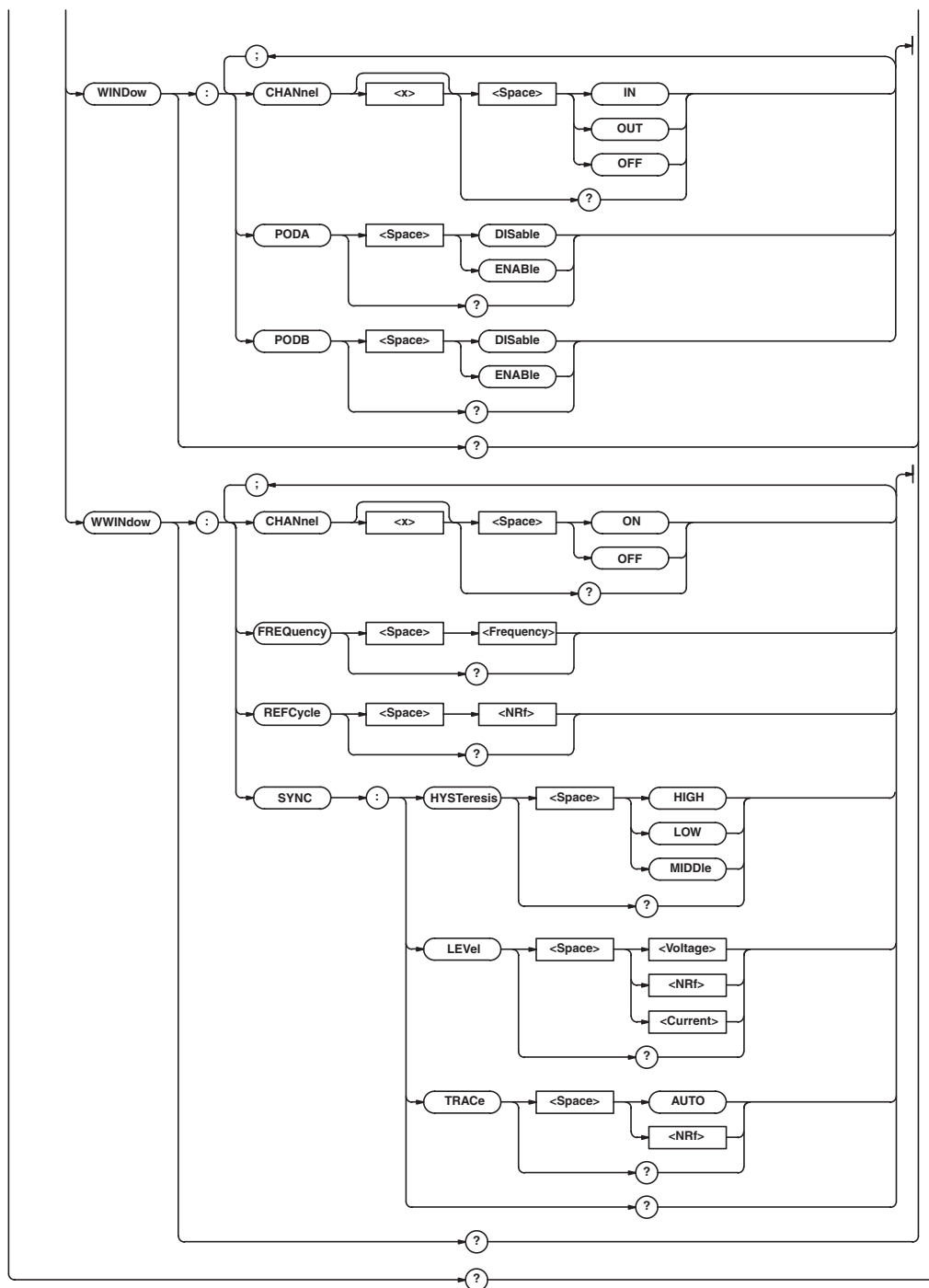
6.29 TRIGger Group





6.29 TRIGger Group





* Select MIN2, MIN3, MIN4, MIN5, MIN6, MIN7, MIN8, MIN9, MIN10, MIN15, MIN20, MIN25, MIN30, MIN40, MIN45, MIN50, HOUR1, HOUR2, HOUR3, HOUR4, HOUR5, HOUR6, HOUR7, HOUR8, HOUR9, HOUR10, HOUR10, HOUR12, HOUR18, or HOUR24

6.29 TRIGger Group

:TRIGger?

Function Queries all settings related to the trigger.

Syntax :TRIGger?

Example :TRIGGER? -> :TRIGGER:ACTION:MODE 0;
HCOPI 0;IMAGE 0;SAVE 0;BUZZER 0;
MAIL:MODE 0;COUNT 100;:TRIGGER:
ACTION:SEQUENCE CONTINUE;:TRIGGER:
SIMPLE:SOURCE 16;LEVEL 0.0E+00;
HYSTERESIS LOW;SLOPE RISE;:TRIGGER:
ABN:COUNT 1;:TRIGGER:ADB:
DELAY 0.0E+00;:TRIGGER:MODE AUTO;
EOA:CHANNEL2 RISE;CHANNEL3 OFF;
CHANNEL4 OFF;CHANNEL5 OFF;
CHANNEL6 OFF;CHANNEL7 OFF;
CHANNEL8 OFF;CHANNEL9 OFF;
CHANNEL10 OFF;CHANNEL11 OFF;
CHANNEL12 OFF;CHANNEL15 OFF;
CHANNEL16 OFF;PODA DISABLE;
PODB DISABLE;CONDITION TRUE;:
TRIGGER:OR:CHANNEL1 RISE;
CHANNEL2 OFF;CHANNEL3 OFF;
CHANNEL4 OFF;CHANNEL5 OFF;
CHANNEL6 OFF;CHANNEL7 OFF;
CHANNEL8 OFF;CHANNEL9 OFF;
CHANNEL10 OFF;CHANNEL11 OFF;
CHANNEL12 OFF;CHANNEL15 OFF;
CHANNEL16 OFF;PODA DISABLE;
PODB DISABLE;:TRIGGER:TYPE SIMPLE;
BGTIME:TIME 100.000E-09;:TRIGGER:
BLTIME:TIME 100.000E-09;:TRIGGER:
BTOUT:TIME 100.000E-09;:TRIGGER:
TGTIME:TIME 100.000E-09;:TRIGGER:
TLTIME:TIME 100.000E-09;:TRIGGER:
TITIME:TIME1 100.000E-09;
TIME2 200.000E-09;:TRIGGER:TOTIME:
TIME1 100.000E-09;
TIME2 200.000E-09;:TRIGGER:TIMER:
DATE "2002/01/01";TIME "00:00:00";
INTERVAL HOUR1;:TRIGGER:WINDOW:
CHANNEL1 IN;CHANNEL2 OFF;
CHANNEL3 OFF;CHANNEL4 OFF;
CHANNEL5 OFF;CHANNEL6 OFF;
CHANNEL7 OFF;CHANNEL8 OFF;
CHANNEL9 OFF;CHANNEL10 OFF;
CHANNEL11 OFF;CHANNEL12 OFF;
CHANNEL15 OFF;CHANNEL16 OFF;
PODA DISABLE;PODB DISABLE;:TRIGGER:
HOLDOFF:TIME 0.0E+00;:TRIGGER:
WWINDOW:CHANNEL1 0;CHANNEL2 0;
CHANNEL3 0;CHANNEL4 0;CHANNEL5 0;
CHANNEL6 0;CHANNEL7 0;CHANNEL8 0;
CHANNEL9 0;CHANNEL10 0;CHANNEL11 0;
CHANNEL12 0;FREQUENCY 50;REFCYCLE 1;
SYNC:TRACE AUTO;HYSTERESIS LOW;:
TRIGGER:SOURCE:CHANNEL1:
LEVEL 0.0E+00;WWIDTH 500.000E-03;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
CHANNEL2:LEVEL 0.0E+00;
WWIDTH 500.000E-03;HYSTERESIS LOW;
CENTER 0.0E+00;WIDTH 50.000E+00;:
TRIGGER:SOURCE:CHANNEL3:LEVEL 0;
WWIDTH 1;HYSTERESIS LOW;CENTER 0;
WIDTH 1;:TRIGGER:SOURCE:CHANNEL4:
LEVEL 0;WWIDTH 1;HYSTERESIS LOW;
CENTER 0;WIDTH 1;:TRIGGER:SOURCE:
CHANNEL5:LEVEL 0.0E+00;WWIDTH
50.000E-03;HYSTERESIS LOW;

CENTER 0.0E+00;WIDTH 5.000E+00;:
TRIGGER:SOURCE:CHANNEL6:
LEVEL 0.0E+00;WWIDTH 50.000E-03;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 5.000E+00;:TRIGGER:SOURCE:
CHANNEL7:LEVEL 0;WWIDTH 1;
HYSTERESIS LOW;CENTER 0;WIDTH 1;:
TRIGGER:SOURCE:CHANNEL8:LEVEL 0;
WWIDTH 1;HYSTERESIS LOW;CENTER 0;
WIDTH 1;:TRIGGER:SOURCE:CHANNEL9:
LEVEL 0.0E+00;WWIDTH 500.000E-03;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
CHANNEL10:LEVEL 0.0E+00;
WWIDTH 500.000E-03;HYSTERESIS LOW;
CENTER 0.0E+00;WIDTH 50.000E+00;:
TRIGGER:SOURCE:CHANNEL11:
LEVEL 0.0E+00;WWIDTH 500.000E-03;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
CHANNEL12:LEVEL 0.0E+00;
WWIDTH 500.000E-03;HYSTERESIS LOW;
CENTER 0.0E+00;WIDTH 50.000E+00;:
TRIGGER:SOURCE:CHANNEL15:
LEVEL 0.0E+00;HYSTERESIS LOW;
CENTER 0.0E+00;WIDTH 5.000E+00;:
TRIGGER:SOURCE:CHANNEL16:
LEVEL 0.0E+00;HYSTERESIS LOW;
CENTER 0.0E+00;WIDTH 5.000E+00;:
TRIGGER:SOURCE:LOGIC:A1 RISE;
A2 DONTCARE;A3 DONTCARE;A4 DONTCARE;
A5 DONTCARE;A6 DONTCARE;A7 DONTCARE;
A8 DONTCARE;B1 DONTCARE;B2 DONTCARE;
B3 DONTCARE;B4 DONTCARE;B5 DONTCARE;
B6 DONTCARE;B7 DONTCARE;
B8 DONTCARE;:TRIGGER:ATRIGGER:
CHANNEL1 HIGH;CHANNEL2 DONTCARE;
CHANNEL3 DONTCARE;CHANNEL4 DONTCARE;
CHANNEL5 DONTCARE;CHANNEL6 DONTCARE;
CHANNEL7 DONTCARE;CHANNEL8 DONTCARE;
CHANNEL9 DONTCARE;CHANNEL
10 DONTCARE;CHANNEL11 DONTCARE;
CHANNEL12 DONTCARE;
CHANNEL15 DONTCARE;
CHANNEL16 DONTCARE;PODA DISABLE;
PODB DISABLE;LOGIC:A1 DONTCARE;
A2 HIGH;A3 DONTCARE;A4 DONTCARE;
A5 DONTCARE;A6 DONTCARE;A7 DONTCARE;
A8 DONTCARE;B1 DONTCARE;B2 DONTCARE;
B3 DONTCARE;B4 DONTCARE;B5 DONTCARE;
B6 DONTCARE;B7 DONTCARE;
B8 DONTCARE;:TRIGGER:ATRIGGER:
CONDITION ENTER;:TRIGGER:BTRIGGER:
CHANNEL1 DONTCARE;CHANNEL2 HIGH;
CHANNEL3 DONTCARE;CHANNEL4 DONTCARE;
CHANNEL5 DONTCARE;CHANNEL6 DONTCARE;
CHANNEL7 DONTCARE;CHANNEL8 DONTCARE;
CHANNEL9 DONTCARE;
CHANNEL10 DONTCARE;
CHANNEL11 DONTCARE;
CHANNEL12 DONTCARE;
CHANNEL15 DONTCARE;
CHANNEL16 DONTCARE;PODA DISABLE;
PODB DISABLE;LOGIC:A1 HIGH;
A2 DONTCARE;A3 DONTCARE;A4 DONTCARE;
A5 DONTCARE;A6 DONTCARE;A7 DONTCARE;
A8 DONTCARE;B1 DONTCARE;B2 DONTCARE;
B3 DONTCARE;B4 DONTCARE;B5 DONTCARE;

```
B6 DONTCARE;B7 DONTCARE;
B8 DONTCARE;:TRIGGER:BTRIGGER:
CONDITION ENTER;:TRIGGER:
DELAY 0.0E+00;POSITION 50.000;
SCOUNT 2
```

:TRIGger:ABN? (A -> B(n))

Function Queries all settings related to the A -> B(n) trigger.

Syntax :TRIGger:ABN?

Example :TRIGGER:ABN? -> :TRIGGER:ABN:COUNT 1

:TRIGger:ABN:COUNT

Function Sets the number times condition B is to be satisfied for the A -> B(n) trigger or queries the current setting.

Syntax :TRIGger:ABN:COUNT {<Nrf>}
:TRIGger:ABN:COUNT?
<Nrf>=1 to 255

Example :TRIGGER:ABN:COUNT 1
:TRIGGER:ABN:COUNT? ->
:TRIGGER:ABN:COUNT 1

:TRIGger:ACTion?

Function Queries all settings related to the action-on-trigger.

Syntax :TRIGger:ACTion?

Example :TRIGGER:ACTION? ->
:TRIGGER:ACTION:SAVE:MODE 0;
TYPE BINARY;:TRIGGER:ACTION:
MODE OFF;HCOPY 0;IMAGE 0;BUZZER 0;
MAIL:MODE 0;COUNT 100;:TRIGGER:
ACTION:SEQUENCE CONTINUE

:TRIGger:ACTion:COUNT

Function Sets the action count of action-on-trigger or queries the current setting.

Syntax :TRIGger:ACTion:COUNT {<Nrf>|
INFinite}
:TRIGger:ACTion:COUNT?
<Nrf> = 2 to 65536

Example :TRIGGER:ACTION:COUNT 10
:TRIGGER:ACTION:COUNT? ->
:TRIGGER:ACTION:COUNT 10

:TRIGger:ACTion:BUZZer

Function Sets whether a beep is sounded when a action is activated or queries the current setting.

Syntax :TRIGger:ACTion:BUZZer {<Boolean>}
:TRIGger:ACTion:BUZZer?

Example :TRIGGER:ACTION:BUZZER ON
:TRIGGER:ACTION:BUZZER? ->
:TRIGGER:ACTION:BUZZER 1

:TRIGger:ACTion:HCOPY

Function Sets whether to output a hard copy to the built-in printer or an external printer when an action is activated or queries the current setting.

Syntax :TRIGger:ACTion:HCOPY {<Boolean>}
:TRIGger:ACTion:HCOPY?

Example :TRIGGER:ACTION:HCOPY ON
:TRIGGER:ACTION:HCOPY? -> :TRIGGER:
ACTION:HCOPY 1

:TRIGger:ACTion:IMAGE

Function Sets whether or not to save the screen image to the external storage medium when action is activated or queries the current setting.

Syntax :TRIGger:ACTion:IMAGE {<Boolean>}
:TRIGger:ACTion:IMAGE?

Example :TRIGGER:ACTION:IMAGE ON
:TRIGGER:ACTION:IMAGE? -> :TRIGGER:
ACTION:IMAGE 1

:TRIGger:ACTion:MAIL?

Function Sets whether to save the screen image to the storage medium when an action is activated or queries the current setting.

Syntax :TRIGger:ACTion:MAIL?

Example :TRIGGER:ACTION:MAIL? ->
:TRIGGER:ACTION:MAIL:MODE 0;
COUNT 100

Description Can be used when the Ethernet interface (option) is installed.

:TRIGger:ACTion:MAIL:COUNT

Function Sets the upper limit on the number of transmitted mail when an action is activated or queries the current setting.

Syntax :TRIGger:ACTion:MAIL:COUNT {<Nrf>}
:TRIGger:ACTion:MAIL:COUNT?
<Nrf>=1 to 1000

Example :TRIGGER:ACTION:MAIL:COUNT 100
:TRIGGER:ACTION:MAIL:COUNT? ->
:TRIGGER:ACTION:MAIL:COUNT 100

Description Can be used when the Ethernet interface (option) is installed.

:TRIGger:ACTion:MAIL:MODE

Function Queries whether a mail is set to be transmitted when an action is activated.

Syntax :TRIGger:ACTion:MAIL:MODE
{<Boolean>}
:TRIGger:ACTion:MAIL:MODE?
:TRIGger:ACTion:MAIL:MODE?

Example :TRIGGER:ACTION:MAIL:MODE OFF
:TRIGGER:ACTION:MAIL:MODE? ->
:TRIGGER:ACTION:MAIL:MODE 0

Description Can be used when the Ethernet interface (option) is installed.

:TRIGger:ACTion:MODE

Function Selects the action-on-trigger or queries the current setting.

Syntax :TRIGger:ACTion:MODE {OFF|ON|STOP}
:TRIGger:ACTion:MODE?
:TRIGger:ACTion:MODE?

Example :TRIGGER:ACTION:MODE ON
:TRIGGER:ACTION:MODE? ->
:TRIGGER:ACTION:MODE ON

:TRIGger:ACTion:SAVE[:MODE]

Function Sets whether or not to save the waveform data to the storage medium (ON/OFF) when an action is activated, or queries the current setting.

Syntax :TRIGger:ACTion:SAVE[:MODE]
{<Boolean>}
:TRIGger:ACTion:SAVE[:MODE]?
:TRIGGER:ACTION:SAVE:MODE ON
:TRIGGER:ACTION:SAVE:MODE? ->
:TRIGGER:ACTION:SAVE:MODE 1

6.29 TRIGger Group

:TRIGger:ACTion:SAVE:TYPE

Function Sets the data type for saving waveform data when an action is activated or queries the current setting.

Syntax **:TRIGger:ACTion:SAVE:TYPE**
{ASCIi|BINary|FLOat}
:TRIGger:ACTion:SAVE:TYPE?

Example **:TRIGGER:ACTION:SAVE:TYPE ASCII**
:TRIGGER:ACTION:SAVE:TYPE? ->
:TRIGGER:ACTION:SAVE:TYPE ASCII

:TRIGger:ACTion:SEquence

Function Sets whether to repeat the action or queries the current setting.

Syntax **:TRIGger:ACTion:SEquence**
{CONTInue|SINGle}
:TRIGger:ACTion:SEquence?

Example **:TRIGGER:ACTION:SEQUENCE CONTINUE**
:TRIGGER:ACTION:SEQUENCE? ->
:TRIGGER:ACTION:SEQUENCE CONTINUE

:TRIGger:ADB? (A Delay B)

Function Queries all settings related to the A Delay B trigger.

Syntax **:TRIGger:ADB?**

Example **:TRIGGER:ADB? -> :TRIGGER:ADB:**
DELAY 0.0E+00

:TRIGger:ADB:DElay

Function Sets the delay time of condition B for the A Delay B trigger or queries the current setting.

Syntax **:TRIGger:ADB:DElay** {<Time>}
:TRIGger:ADB:DElay?
<Time>=0 ns to 10 s

Example **:TRIGGER:ADB:DELAY 1US**
:TRIGGER:ADB:DELAY? ->
:TRIGGER:ADB:DELAY 1.000000E-06

:TRIGger:ATRigger?

Function Queries all settings related to condition A.

Syntax **:TRIGger:ATRigger?**

Example **:TRIGGER:ATRIGGER? -> :TRIGGER:**
ATRIGGER:CHANNEL1 HIGH;
CHANNEL2 DONTCARE;CHANNEL3 DONTCARE;
CHANNEL4 DONTCARE;CHANNEL5 DONTCARE;
CHANNEL6 DONTCARE;CHANNEL7 DONTCARE;
CHANNEL8 DONTCARE;CHANNEL9 DONTCARE;
CHANNEL10 DONTCARE;
CHANNEL11 DONTCARE;
CHANNEL12 DONTCARE;
CHANNEL13 DONTCARE;
CHANNEL14 DONTCARE;
CHANNEL15 DONTCARE;
CHANNEL16 DONTCARE;PODA DISABLE;
PODB DISABLE;LOGIC:A1 DONTCARE;
A2 HIGH;A3 DONTCARE;A4 DONTCARE;
A5 DONTCARE;A6 DONTCARE;A7 DONTCARE;
A8 DONTCARE;B1 DONTCARE;B2 DONTCARE;
B3 DONTCARE;B4 DONTCARE;B5 DONTCARE;
B6 DONTCARE;B7 DONTCARE;
B8 DONTCARE;:TRIGGER:ATRIGGER:
CONDITION ENTER

:TRIGger:ATRigger:CHANnel<x>

Function Sets the channel condition of condition A or queries the current setting.

Syntax **:TRIGger:ATRigger:CHANnel<x>**
{DONTcare|HIGH|LOW}
:TRIGger:ATRigger:CHANnel<x>?
<x> of CHANnel<x>=1 to 16

Example (The following is an example for CH1.)
:TRIGGER:ATRIGGER:CHANNEL1 HIGH
:TRIGGER:ATRIGGER:CHANNEL1? ->
:TRIGGER:ATRIGGER:CHANNEL1 HIGH

:TRIGger:ATRigger:CONDition

Function Sets the condition to be satisfied for condition A or queries the current setting.

Syntax **:TRIGger:ATRigger:CONDition**
{ENTER|EXIT}
:TRIGger:ATRigger:CONDition?

Example **:TRIGGER:ATRIGGER:CONDITION ENTER**
:TRIGGER:ATRIGGER:CONDITION? ->
:TRIGGER:ATRIGGER:CONDITION ENTER

Description This command is valid when the trigger type is set to ABN or ADB.

:TRIGger:ATRigger:LOGic?

Function Queries all settings related the logic of condition A.

Syntax **:TRIGger:ATRigger:LOGic?**

Example **:TRIGGER:ATRIGGER:LOGIC? ->**
:TRIGGER:ATRIGGER:LOGIC:
A1 DONTCARE;A2 HIGH;
A3 DONTCARE;A4 DONTCARE;
A5 DONTCARE;A6 DONTCARE;
A7 DONTCARE;A8 DONTCARE;
B1 DONTCARE;B2 DONTCARE;
B3 DONTCARE;B4 DONTCARE;
B5 DONTCARE;B6 DONTCARE;
B7 DONTCARE;B8 DONTCARE

:TRIGger:ATRigger:LOGic:

{A1~A8|B1~B8}

Function Sets the logic bit of condition A or queries the current setting.

Syntax **:TRIGger:ATRigger:LOGic:{A1~A8|**
B1~B8} {DONTcare|HIGH|LOW}
:TRIGger:ATRigger:LOGic:{A1~A8|
B1~B8}?

Example **:TRIGGER:ATRIGGER:LOGIC:A1 HIGH**
:TRIGGER:ATRIGGER:LOGIC:A1? ->
:TRIGGER:ATRIGGER:LOGIC:A1 HIGH

:TRIGger:ATRigger:{PODA|PODB}

Function Sets the logic condition of condition A or queries the current setting.

Syntax **:TRIGger:ATRigger:{PODA|PODB}**
{DISable|ENABle}
:TRIGger:ATRigger:{PODA|PODB}?

Example **:TRIGGER:ATRIGGER:PODA DISABLE**
:TRIGGER:ATRIGGER:PODA? ->
:TRIGGER:ATRIGGER:PODA DISABLE

:TRIGger:BGTime?

Function Queries all settings related to the B>Time trigger.

Syntax :TRIGger:BGTime?

Example :TRIGGER:BGTIME? ->
:TRIGGER:BGTIME:TIME 100.000E-09

:TRIGger:BGTime:TIME

Function Sets the pulse width of the B>Time trigger or queries the current setting.

Syntax :TRIGger:BGTime:TIME {<Time>}
:TRIGger:BGTime:TIME?
<Time>=100 ns to 10 s

Example :TRIGGER:BGTIME:TIME 200NS
:TRIGGER:BGTIME:TIME? ->
:TRIGGER:BGTIME:TIME 200.000E-09

:TRIGger:BLTime?

Function Queries all settings related to the B<Time trigger.

Syntax :TRIGger:BLTime?

Example :TRIGGER:BLTIME? ->
:TRIGGER:BLTIME:TIME 200.000E-09

:TRIGger:BLTime:TIME

Function Sets the pulse width of the B<Time trigger or queries the current setting.

Syntax :TRIGger:BLTime:TIME {<Time>}
:TRIGger:BLTime:TIME?
<Time>=100 ns to 10 s

Example :TRIGGER:BLTIME:TIME 600NS
:TRIGGER:BLTIME:TIME? ->
:TRIGGER:BLTIME:TIME 600.000E-09

:TRIGger:BTOut?

Function Queries all settings related to the B Time Out trigger.

Syntax :TRIGger:BTOut?

Example :TRIGGER:BTOUT? -> :TRIGGER:BTOUT:
TIME 600.000E-09

:TRIGger:BTOut:TIME

Function Sets the pulse width of the B Time Out trigger or queries the current setting.

Syntax :TRIGger:BTOut:TIME {<Time>}
:TRIGger:BTOut:TIME?
<Time>=100 ns to 10 s

Example :TRIGGER:BTOUT:TIME 8S
:TRIGGER:BTOUT:TIME? ->
:TRIGGER:BTOUT:
TIME 8.000000000000E+00

:TRIGger:BTRigger?

Function Queries all settings related to condition B.

Syntax :TRIGger:BTRigger?

Example :TRIGGER:BTRIGGER? -> :TRIGGER:
BTRIGGER:CHANNEL1 DONTCARE;
CHANNEL2 HIGH;CHANNEL3 DONTCARE;
CHANNEL4 DONTCARE;CHANNEL5 DONTCARE;
CHANNEL6 DONTCARE;CHANNEL7 DONTCARE;
CHANNEL8 DONTCARE;CHANNEL9 DONTCARE;
CHANNEL10 DONTCARE;
CHANNEL11 DONTCARE;
CHANNEL12 DONTCARE;
CHANNEL13 DONTCARE;
CHANNEL14 DONTCARE;
CHANNEL15 DONTCARE;
CHANNEL16 DONTCARE;PODA DISABLE;
PODB DISABLE;LOGIC:A1 HIGH;
A2 DONTCARE;A3 DONTCARE;A4 DONTCARE;
A5 DONTCARE;A6 DONTCARE;A7 DONTCARE;
A8 DONTCARE;B1 DONTCARE;B2 DONTCARE;
B3 DONTCARE;B4 DONTCARE;B5 DONTCARE;
B6 DONTCARE;B7 DONTCARE;
B8 DONTCARE;:TRIGGER:BTRIGGER:
CONDITION ENTER

:TRIGger:BTRigger:CHANnel<x>

Function Sets the channel condition of condition B or queries the current setting.

Syntax :TRIGger:BTRigger:CHANnel<x>
{DONTcare|HIGH|LOW}
:TRIGger:BTRigger:CHANnel<x>?
<x> of CHANnel<x>=1 to 16

Example (The following is an example for CH1.)
:TRIGGER:BTRIGGER:CHANNEL1 HIGH
:TRIGGER:BTRIGGER:CHANNEL1? ->
:TRIGGER:BTRIGGER:CHANNEL1 HIGH

:TRIGger:BTRigger:CONDition

Function Sets the condition to be satisfied for condition B or queries the current setting.

Syntax :TRIGger:BTRigger:CONDition
{ENTER|EXIT}
:TRIGger:BTRigger:CONDition?

Example :TRIGGER:BTRIGGER:CONDITION ENTER
:TRIGGER:BTRIGGER:CONDITION? ->
:TRIGGER:BTRIGGER:CONDITION ENTER

Description This command is valid when the trigger type is set to ABN or ADB.

:TRIGger:BTRigger:LOGic?

Function Queries all settings related the logic of condition B.

Syntax :TRIGger:BTRigger:LOGic?

Example :TRIGGER:BTRIGGER:LOGIC? ->
:TRIGGER:
BTRIGGER:LOGIC:A1 HIGH;A2 DONTCARE;
A3 DONTCARE;A4 DONTCARE;A5 DONTCARE;
A6 DONTCARE;A7 DONTCARE;A8 DONTCARE;
B1 DONTCARE;B2 DONTCARE;B3 DONTCARE;
B4 DONTCARE;B5 DONTCARE;B6 DONTCARE;
B7 DONTCARE;B8 DONTCARE

6.29 TRIGger Group

:TRIGger:BTRigger:LOGic:

{A1~A8 | B1~B8}

Function	Sets the logic bit of condition B or queries the current setting.
Syntax	:TRIGger:BTRigger:LOGic:{A1~A8 B1~B8} {DONTcare HIGH LOW} :TRIGger:BTRigger:LOGic:{A1~A8 B1~B8}?
Example	:TRIGGER:BTRIGGER:LOGIC:B1 HIGH :TRIGGER:BTRIGGER:LOGIC:B1? -> :TRIGGER:BTRIGGER:LOGIC:B1 HIGH

:TRIGger:BTRigger:{PODA | PODB}

Function	Sets the logic condition of condition B or queries the current setting.
Syntax	:TRIGger:BTRigger:{PODA PODB} {DISable ENABLE} :TRIGger:BTRigger:{PODA PODB}?
Example	:TRIGGER:BTRIGGER:PODB ENABLE :TRIGGER:BTRIGGER:PODB? -> :TRIGGER:BTRIGGER:PODB ENABLE

:TRIGger:DElay

Function	Sets the delay (time from the trigger point to the trigger position) or queries the current setting.
Syntax	:TRIGger:DElay {<Time>} :TRIGger:DElay? <Time>=0 to 10 s (1/sample rate/10)
Example	:TRIGGER:DELAY 2US :TRIGGER:DELAY? -> :TRIGGER: DELAY 2.000000E-06
Description	- Fixed to 0 when the time base clock is set to external clock. - On the SL1400, the trigger delay sets the time from the trigger point to the trigger position. To set or query the trigger position, use :TRIGger:POsition.

:TRIGger:EOA?

Function	Queries all settings related to the Edge on A trigger.
Syntax	:TRIGger:EOA?
Example	:TRIGGER:EOA? -> :TRIGGER:EOA: CHANNEL1 OFF;CHANNEL2 RISE; CHANNEL3 OFF;CHANNEL4 OFF; CHANNEL5 OFF;CHANNEL6 OFF; CHANNEL7 OFF;CHANNEL8 OFF; CHANNEL9 OFF;CHANNEL10 OFF; CHANNEL11 OFF;CHANNEL12 OFF; CHANNEL13 OFF;CHANNEL14 OFF; CHANNEL15 OFF;CHANNEL16 OFF; PODA DISABLE;PODB DISABLE; CONDITION TRUE

:TRIGger:EOA:CHANnel<x>

Function	Sets the channel condition of the Edge on A trigger or queries the current setting.
Syntax	:TRIGger:EOA:CHANnel<x> {OFF FALL RISE} :TRIGger:EOA:CHANnel<x>? <x> of CHANnel<x>=1 to 16
Example	(The following is an example for CH1.) :TRIGGER:EOA:CHANNEL1 FALL :TRIGGER:EOA:CHANNEL1? -> :TRIGGER:EOA:CHANNEL1 FALL

:TRIGger:EOA:{PODA | PODB}

Function	Sets the logic condition of the Edge on A trigger or queries the current setting.
Syntax	:TRIGger:EOA:{PODA PODB} {DISable ENABLE} :TRIGger:EOA:{PODA PODB}?
Example	:TRIGGER:EOA:PODB ENABLE :TRIGGER:EOA:PODB? -> :TRIGGER:EOA: PODB ENABLE

:TRIGger:EOA:CONDition

Function	Sets the condition to be satisfied for the Edge on A trigger or queries the current setting.
Syntax	:TRIGger:EOA:CONDition {TRUE FALSE} :TRIGger:EOA:CONDition?
Example	:TRIGGER:EOA:CONDITION TRUE :TRIGGER:EOA:CONDITION? -> :TRIGGER:EOA:CONDITION TRUE

:TRIGger:HOLDoff?

Function	Queries all settings related to the hold off.
Syntax	:TRIGger:HOLDoff?
Example	:TRIGGER:HOLDOFF? -> :TRIGGER:HOLDOFF:TIME 100.000E-09

:TRIGger:HOLDoff:TIME

Function	Sets the hold off time or queries the current setting.
Syntax	:TRIGger:HOLDoff:TIME {<Time>} :TRIGger:HOLDoff:TIME? <Time>=0 to 10 s
Example	:TRIGGER:HOLDOFF:TIME 500NS :TRIGGER:HOLDOFF:TIME? -> :TRIGGER: HOLDOFF:TIME 500.000E-09

:TRIGger:MODE

Function	Sets the trigger mode or queries the current setting.
Syntax	:TRIGger:MODE {AUTO ALEvel NORMal SINGle NSINGle REPeat} :TRIGger:MODE?
Example	:TRIGGER:MODE AUTO :TRIGGER:MODE? -> :TRIGGER: MODE AUTO
Description	- To set or query the count when NSINGle is specified, use :TRIGger:SCount. "REPeat" can be specified only when the recorder mode is Chart Recorder, the print style is waveform, and short recording is not OFF.

:TRIGger:OR?

Function	Queries all settings related to the OR trigger.
Syntax	:TRIGger:OR?
Example	:TRIGGER:OR? -> :TRIGGER:OR: CHANNEL1 RISE;CHANNEL2 OFF; CHANNEL3 OFF;CHANNEL4 OFF; CHANNEL5 OFF;CHANNEL6 OFF; CHANNEL7 OFF;CHANNEL8 OFF; CHANNEL11 OFF;CHANNEL12 OFF; CHANNEL13 OFF;CHANNEL14 OFF; CHANNEL15 OFF;CHANNEL16 OFF; PODA DISABLE;PODB DISABLE

:TRIGger:OR:CHANnel<x>

Function Sets the channel condition of the OR trigger or queries the current setting.

Syntax **:TRIGger:OR:CHANnel<x>**
{OFF|FALL|RISE}
:TRIGger:OR:CHANnel<x>?
 <x> of CHANnel<x>=1 to 16

Example (The following is an example for CH1.)
:TRIGGER:OR:CHANNEL1 RISE
:TRIGGER:OR:CHANNEL1? ->
:TRIGGER:OR:CHANNEL1 RISE

:TRIGger:OR:{PODA|PODB}

Function Sets the logic condition of the OR trigger or queries the current setting.

Syntax **:TRIGger:OR:{PODA|PODB}**
{DISable|ENABle}
:TRIGger:OR:{PODA|PODB}?

Example **:TRIGGER:OR:PODA ENABLE**
:TRIGGER:OR:PODA? -> :TRIGGER:OR:
PODA ENABLE

:TRIGger:POSition

Function Sets the trigger position or queries the current setting.

Syntax **:TRIGger:POSition {<Nrf>}**
:TRIGger:POSition?
 <Nrf>=0 to 100 (% , 0.1 steps)

Example **:TRIGGER:POSITION 50**
:TRIGGER:POSITION? ->
:TRIGGER:POSITION 50.000

:TRIGger:SCount (Single(N) Count)

Function Sets the number of times the trigger is to be activated when the trigger mode is Single(N) or queries the current setting.

Syntax **:TRIGger:SCount {<Nrf>}**
:TRIGger:SCount?
 <Nrf>=1 to 2000

Example **:TRIGGER:SCOUNT 100**
:TRIGGER:SCOUNT? -> :TRIGGER:
SCOUNT 100

:TRIGger[:SIMPlE]?

Function Queries all settings related to the simple trigger.

Syntax **:TRIGger:SIMPlE?**

Example **:TRIGGER:SIMPLE? -> :TRIGGER:**
SIMPLE:SOURCE 1;LEVEL 0.0E+00;
HYSTERESIS LOW;SLOPE RISE;LOGIC:
BIT 2;SLOPE RISE

:TRIGger[:SIMPlE]:HYSTeresis

Function Sets the hysteresis of the simple trigger search level or queries the current setting.

Syntax **:TRIGger[:SIMPlE]:HYSTeresis**
{HIGH|LOW|MIDDLE}
:TRIGger[:SIMPlE]:HYSTeresis?

Example **:TRIGGER:SIMPLE:HYSTERESIS MIDDLE**
:TRIGGER:SIMPLE:HYSTERESIS? ->
:TRIGGER:SIMPLE:HYSTERESIS MIDDLE

Description This command cannot be used when the trigger is set to EXTERNAL, LINE, TIME, LOGICA, or LOGICB.

:TRIGger[:SIMPlE]:LEVel

Function Sets the trigger level of the channel specified using **TRIGger[:SIMPlE]:** SOURCE for the simple trigger or queries the current setting.

Syntax **:TRIGger[:SIMPlE]:LEVel**
{<Voltage>|<Nrf>|<Current>}
:TRIGger[:SIMPlE]:LEVel?
 <Voltage>|<Nrf>|<Current>=The selectable range varies depending on the range and offset settings. For details, see the *User's Manual*.

Example **:TRIGGER:SIMPLE:LEVEL 0V**
:TRIGGER:SIMPLE:LEVEL? -> :TRIGGER:
SIMPLE:LEVEL 0.0E+00

Description This command cannot be used when the trigger is set to EXTERNAL, LINE, TIME, LOGICA, or LOGICB.

:TRIGger[:SIMPlE]:LOGic?

Function Queries all settings related to the logic of the simple trigger.

Syntax **:TRIGger[:SIMPlE]:LOGic?**

Example **:TRIGGER:SIMPLE:LOGIC? -> :TRIGGER:**
SIMPLE:LOGIC:BIT 2;SLOPE RISE

:TRIGger[:SIMPlE]:LOGic:BIT

Function Sets the bit for setting the trigger slope or queries the current setting.

Syntax **:TRIGger[:SIMPlE]:LOGic:BIT {<Nrf>}**
:TRIGger[:SIMPlE]:LOGic:BIT?
 <Nrf>=1 to 8

Example **:TRIGGER:SIMPLE:LOGIC:BIT 2**
:TRIGGER:SIMPLE:LOGIC:BIT? ->
:TRIGGER:SIMPLE:LOGIC:BIT 2

:TRIGger[:SIMPlE]:LOGic:SLOPe

Function Sets the logic trigger slope or queries the current setting.

Syntax **:TRIGger[:SIMPlE]:LOGic:SLOPe**
{FALL|RISE}
:TRIGger[:SIMPlE]:LOGic:SLOPe?

Example **:TRIGGER:SIMPLE:LOGIC:SLOPE FALL**
:TRIGGER:SIMPLE:LOGIC:SLOPE? ->
:TRIGGER:SIMPLE:LOGIC:SLOPE FALL

:TRIGger[:SIMPlE]:SLOPe

Function Sets the trigger slope of the channel specified using **TRIGger[:SIMPlE]:** SOURCE for the simple trigger or queries the current setting.

Syntax **:TRIGger[:SIMPlE]:SLOPe**
{BOTH|FALL|RISE}
:TRIGger[:SIMPlE]:SLOPe?

Example **:TRIGGER:SIMPLE:SLOPE RISE**
:TRIGGER:SIMPLE:SLOPE? -> :TRIGGER:
SIMPLE:SLOPE RISE

Description This command cannot be used when the trigger is set to EXTERNAL, LINE, TIME, LOGICA, or LOGICB.

6.29 TRIGger Group

:TRIGger:SIMPlE:SOURce

Function	Sets the trigger source of the simple trigger search level or queries the current setting.
Syntax	:TRIGger:SIMPlE:SOURce {<NRf> EXTErnal LINE TIME PODA PODB} :TRIGger[:SIMPlE]:SOURce? <NRf>=1 to 16
Example	:TRIGGER:SIMPLE:SOURCE 1 :TRIGGER:SIMPLE:SOURCE? -> :TRIGGER:SIMPLE:SOURCE 1
Description	Of the :TRIGger:SIMPlE commands, :SIMPlE cannot be abbreviated for the :TRIGger:SIMPlE:SOURce command.

:TRIGger:SOURce?

Function	Queries all settings related to the enhanced trigger.
Syntax	:TRIGger:SOURce?
Example	:TRIGGER:SOURCE? -> :TRIGGER:SOURCE: CHANNEL1:LEVEL 0.0E+00; WWIDTH 500.000E-03;HYSTERESIS LOW; CENTER 0.0E+00;WIDTH 5.000E+00;; TRIGGER:SOURCE:CHANNEL2: LEVEL 0.0E+00;WWIDTH 500.000E-03; HYSTERESIS LOW;CENTER 0.0E+00; WIDTH 5.000E+00;;TRIGGER:SOURCE: CHANNEL3:LEVEL 0.0E+00; WWIDTH 50.000E-03;HYSTERESIS LOW; CENTER 0.0E+00;WIDTH 500.000E-03;; TRIGGER:SOURCE:CHANNEL4: LEVEL 0.0E+00;WWIDTH 50.000E-03; HYSTERESIS LOW;CENTER 0.0E+00; WIDTH 500.000E-03;;TRIGGER:SOURCE: CHANNEL5:LEVEL 0.0E+00; HYSTERESIS LOW;CENTER 0.0E+00; WIDTH 500.000E-03;;TRIGGER:SOURCE: CHANNEL6:LEVEL 0.0E+00; HYSTERESIS LOW;CENTER 0.0E+00; WIDTH 500.000E-03;;TRIGGER:SOURCE: CHANNEL7:LEVEL 0;WWIDTH 1; HYSTERESIS LOW;CENTER 0;WIDTH 1;; TRIGGER:SOURCE:CHANNEL8:LEVEL 0; WWIDTH 1;HYSTERESIS LOW;CENTER 0; WIDTH 1;;TRIGGER:SOURCE:CHANNEL11: LEVEL 0.0E+00;WWIDTH 500.000E-03; HYSTERESIS LOW;CENTER 0.0E+00; WIDTH 5.000E+00;;TRIGGER:SOURCE: CHANNEL12:LEVEL 0.0E+00; WWIDTH 500.000E-03;HYSTERESIS LOW; CENTER 0.0E+00;WIDTH 5.000E+00;; TRIGGER:SOURCE:CHANNEL13:LEVEL 0; WWIDTH 1;HYSTERESIS LOW;CENTER 0; WIDTH 1;;TRIGGER:SOURCE:CHANNEL14: LEVEL 0;WWIDTH 1;HYSTERESIS LOW; CENTER 0;WIDTH 1;;TRIGGER:SOURCE: CHANNEL15:LEVEL 0.000000E+00; HYSTERESIS LOW;CENTER 0.000000E+00; WIDTH 100.0000E+00;;TRIGGER:SOURCE: CHANNEL16:LEVEL 0.000000E+00; HYSTERESIS LOW;CENTER 0.000000E+00; WIDTH 100.0000E+00;;TRIGGER:SOURCE: LOGIC:A1 RISE;A2 DONTCARE; A3 DONTCARE;A4 DONTCARE;A5 DONTCARE; A6 DONTCARE;A7 DONTCARE;A8 DONTCARE; B1 DONTCARE;B2 DONTCARE;B3 DONTCARE; B4 DONTCARE;B5 DONTCARE;B6 DONTCARE; B7 DONTCARE;B8 DONTCARE

:TRIGger:SOURce:CHANnel<x>?

Function	Queries all settings related to the trigger source of the specified channel of the enhanced trigger.
Syntax	:TRIGger:SOURce:CHANnel<x>? <x>=1 to 16
Example	(The following is an example for CH1.) :TRIGGER:SOURCE:CHANNEL1? -> :TRIGGER:SOURCE:CHANNEL1: LEVEL 0.0E+00;HYSTERESIS LOW; CENTER 0.0E+00;WIDTH 50.000E+00

:TRIGger:SOURce:CHANnel<x>:CENTER

Function	Sets the center of the window trigger or queries the current setting.
Syntax	:TRIGger:SOURce:CHANnel<x>: CENTER {<Voltage> <NRf> <Current>} :TRIGger:SOURce:CHANnel<x>:CENTER? <x>=1 to 16 {<Voltage> <NRf> <Current>}=The selectable range varies depending on the range and offset settings. For details, see the <i>User's Manual</i> .
Example	(The following is an example for CH1.) :TRIGGER:SOURCE:CHANNEL1:CENTER 5V :TRIGGER:SOURCE:CHANNEL1:CENTER? -> :TRIGGER:SOURCE:CHANNEL1: CENTER 5.000E+00

:TRIGger:SOURce:CHANnel<x>: **HYSTeresis**

Function	Sets the hysteresis of the enhanced trigger search level or queries the current setting.
Syntax	:TRIGger:SOURce:CHANnel<x> :HYSTeresis {HIGH LOW MIDDLE} :TRIGger:SOURce:CHANnel<x> :HYSTeresis? <x>=1 to 16
Example	(The following is an example for CH1.) :TRIGGER:SOURCE:CHANNEL1: HYSTERESIS HIGH :TRIGGER:SOURCE:CHANNEL1: HYSTERESIS? -> :TRIGGER:SOURCE: CHANNEL1:HYSTERESIS HIGH

:TRIGger:SOURce:CHANnel<x>:LEVel

Function	Sets the trigger level of the specified channel for the enhanced trigger or queries the current setting.
Syntax	:TRIGger:SOURce:CHANnel<x> :LEVel {<Voltage> <NRf> <Current>} :TRIGger:SOURce:CHANnel<x>:LEVel? <x>=1 to 16 {<Voltage> <NRf> <Current>}=The selectable range varies depending on the range and offset settings. For details, see the <i>User's Manual</i> .
Example	(The following is an example for CH1.) :TRIGGER:SOURCE:CHANNEL1:LEVEL 0V :TRIGGER:SOURCE:CHANNEL1:LEVEL? -> :TRIGGER:SOURCE:CHANNEL1: LEVEL 0.0E+00

:TRIGger:SOURce:CHANnel<x>:WIDTH

Function Sets the width of the window trigger or queries the current setting.

Syntax **:TRIGger:SOURce:CHANnel<x>**
:WIDTH {<Voltage>|<NRf>|<Current>}
:TRIGger:SOURce:CHANnel<x>:WIDTH?
<x>=1 to 16
{<Voltage>|<NRf>|<Current>}=The selectable range varies depending on the range and offset settings. For details, see the *User's Manual*.

Example (The following is an example for CH1.)
:TRIGGER:SOURCE:CHANNEL1:WIDTH 55V
:TRIGGER:SOURCE:CHANNEL1:WIDTH? ->
TRIGGER:SOURCE:CHANNEL1:
WIDTH 55.000E+00

:TRIGger:SOURce:CHANnel<x>:WWIDTH

Function Sets the width of the wave window trigger or queries the current setting.

Syntax **:TRIGger:SOURce:CHANnel<x>:WWIDTH**
{<Voltage>|<NRf>|<Current>}
:TRIGger:SOURce:CHANnel<x>:WWIDTH?
<x>=1 to 16
{<Voltage>|<NRf>|<Current>}=See the *User's Manual*.

Example (The following is an example for CH1.)
:TRIGGER:SOURCE:CHANNEL1:WWIDTH 55V
:TRIGGER:SOURCE:CHANNEL1:WWIDTH? ->
TRIGGER:SOURCE:CHANNEL1:
WWIDTH 55.000E+00

:TRIGger:SOURce:LOGic:{A1~A8|B1~B8}

Function Sets the logic bit condition or queries the current setting.

Syntax **:TRIGger:SOURce:LOGic:{A1~A8|B1~B8}**
{DONTcare|FALL|RISE}
:TRIGger:SOURce:LOGic:{A1~A8|
B1~B8}?
<x>=1 to 16

Example **:TRIGGER:SOURCE:LOGIC:A1 RISE**
:TRIGGER:SOURCE:LOGIC:A1? ->
TRIGGER:SOURCE:LOGIC:A1 RISE

Description This command is for setting or querying the edge pattern when the trigger is set to Edge on A, OR, or Window.

:TRIGger:TGTime?

Function Queries all settings related to the T>Time trigger.

Syntax **:TRIGger:TGTime?**

Example **:TRIGGER:TGTIME? ->**
TRIGGER:TGTIME:TIME 100.000E-09

:TRIGger:TGTime:TIME

Function Sets the pulse width of the T>Time trigger or queries the current setting.

Syntax **:TRIGger:TGTime:TIME {<Time>}**
:TRIGger:TGTime:TIME?
<Time>=100 ns to 10 s

Example **:TRIGGER:TGTIME:TIME 600NS**
:TRIGGER:TGTIME:TIME? -> :TRIGGER:
TGTIME:TIME 600.000E-09

:TRIGger:TIMER?

Function Queries all settings related to the timer trigger.

Syntax **:TRIGger:TIMER?**

Example **:TRIGGER:TIMER? -> :TRIGGER:TIMER:**
DATE "99/01/01";TIME "00:00:00";
INTERVAL HOUR1

:TRIGger:TIMER:DATE

Function Sets the date of the timer trigger or queries the current setting.

Syntax **:TRIGger:TIMER:DATE <String>**
:TRIGger:TIMER:DATE?
<String>=YYYY/MM/DD

Example **:TRIGGER:TIMER:DATE "2002/06/04"**
:TRIGGER:TIMER:DATE? ->
TRIGGER:TIMER:DATE "2002/06/04"

:TRIGger:TIMER:INTERval

Function Sets the trigger time interval of the timer trigger or queries the current setting.

Syntax **:TRIGger:TIMER:INTERval {MIN1|MIN2|**
MIN3|MIN4|MIN5|MIN6|MIN7|MIN8|MIN9|
MIN10|MIN15|MIN20|MIN25|MIN30|MIN40|
MIN45|MIN50|HOUR1|HOUR2|HOUR3|HOUR4|
HOUR5|HOUR6|HOUR7|HOUR8|HOUR9|HOUR10|
HOUR11|HOUR12|HOUR18|HOUR24}
:TRIGger:TIMER:INTERval?

Example **:TRIGGER:TIMER:INTERVAL HOUR1**
:TRIGGER:TIMER:INTERVAL? ->
TRIGGER:TIMER:INTERVAL HOUR1

:TRIGger:TIMER:TIME

Function Sets the trigger time of the timer trigger or queries the current setting.

Syntax **:TRIGger:TIMER:TIME <String>**
:TRIGger:TIMER:TIME?
<String>=HH:MM:SS

Example **:TRIGGER:TIMER:TIME "12:34:56"**
:TRIGGER:TIMER:TIME? ->
TRIGGER:TIMER:TIME "12:34:56"

:TRIGger:TITime?

Function Queries all settings related to the T1<T2 trigger.

Syntax **:TRIGger:TITime?**

Example **:TRIGGER:TITIME? -> :TRIGGER:**
TITIME:TIME1 100.000E-09;
TIME2 200.000E-09

:TRIGger:TITime:TIME<x>

Function Sets the pulse width of the T1<T2 trigger or queries the current setting.

Syntax **:TRIGger:TITime:TIME<x> {<Time>}**
:TRIGger:TITime:TIME<x>?
<Time>=100 ns to 10 s
<x>=1 to 2

Example **:TRIGGER:TITIME:TIME1 100NS**
:TRIGGER:TITIME:TIME1? -> :TRIGGER:
TITIME:TIME1 100.000E-09

:TRIGger:TLTime?

Function Queries all settings related to the <Time trigger.

Syntax **:TRIGger:TLTime?**

Example **:TRIGGER:TLTIME? ->**
TRIGGER:TLTIME:TIME 600.000E-09

6.29 TRIGger Group

:TRIGger:TLTime:TIME

Function Sets the pulse width of the T<Time trigger or queries the current setting.

Syntax **:TRIGger:TLTime:TIME** {<Time>}
:TRIGger:TLTime:TIME?
<Time>=100 ns to 10 s

Example **:TRIGGER:TLTIME:TIME 500NS**
:TRIGGER:TLTIME:TIME? -> :TRIGGER:
TLTIME:TIME 500.000E-09

:TRIGger:TOTime?

Function Queries all settings related to the T<T1, T2<T trigger.

Syntax **:TRIGger:TOTime?**

Example **:TRIGGER:TOTIME? -> :TRIGGER:**
TOTIME:TIME1 200.000E-09;
TIME2 300.000E-09

:TRIGger:TOTime:TIME<x>

Function Sets the pulse width of the T<T1, T2<T trigger or queries the current setting.

Syntax **:TRIGger:TOTime:TIME<x>** {<Time>}
:TRIGger:TOTime:TIME<x>?
<Time>=100 ns to 10 s
<x>=1 to 2

Example **:TRIGGER:TOTIME:TIME1 200NS**
:TRIGGER:TOTIME:TIME1? -> :TRIGGER:
TOTIME:TIME1 200.000E-09

:TRIGger:TYPE

Function Sets the trigger type or queries the current setting.

Syntax **:TRIGger:TYPE** {ABN|ADB|EOA|BLTime|
BGTime|BTOut|WINDOW|OR|SIMPLE|TGTime|
TLTime|TITime|TOTime|WWINDOW}
:TRIGger:TYPE?

Example **:TRIGGER:TYPE SIMPLE**
:TRIGGER:TYPE? -> :TRIGGER:
TYPE SIMPLE

:TRIGger:WINDOW?

Function Queries all settings related to the window trigger.

Syntax **:TRIGger:WINDOW?**

Example **:TRIGGER:WINDOW? -> :TRIGGER:**
WINDOW:CHANNEL1 IN;CHANNEL2 OFF;
CHANNEL3 OFF;CHANNEL4 OFF;
CHANNEL5 OFF;CHANNEL6 OFF;
CHANNEL7 OFF;CHANNEL8 OFF;
CHANNEL9 OFF;CHANNEL10 OFF;
CHANNEL11 OFF;CHANNEL12 OFF;
CHANNEL13 OFF;CHANNEL14 OFF;
CHANNEL15 OFF;CHANNEL16 OFF;
PODA DISABLE;PODB DISABLE

:TRIGger:WINDOW:CHANNEL<x>

Function Sets the channel condition of the window trigger or queries the current setting.

Syntax **:TRIGger:WINDOW:CHANNEL<x>**
{IN|OUT|OFF}
:TRIGger:WINDOW:CHANNEL<x>?
<x>=1 to 16

Example (The following is an example for CH1.)
:TRIGGER:WINDOW:CHANNEL1 OUT
:TRIGGER:WINDOW:CHANNEL1? ->
:TRIGGER:WINDOW:CHANNEL1 OUT

:TRIGger:WINDOW:{PODA|PODB}

Function Sets the logic condition of the window trigger or queries the current setting.

Syntax **:TRIGger:WINDOW:{PODA|PODB}**
{DISable|ENABLE}
:TRIGger:WINDOW:{PODA|PODB}?

Example **:TRIGGER:WINDOW:PODA ENABLE**
:TRIGGER:WINDOW:PODA? -> :TRIGGER:
WINDOW:PODA ENABLE

:TRIGger:WWINDOW?

Function Queries all settings related to the wave window trigger.

Syntax **:TRIGger:WWINDOW?**

Example **:TRIGGER:WWINDOW? -> :TRIGGER:**
WWINDOW:CHANNEL1 0;CHANNEL2 0;
CHANNEL3 0;CHANNEL4 0;CHANNEL7 0;
CHANNEL8 0;CHANNEL9 0;CHANNEL10 0;
CHANNEL11 0;CHANNEL12 0;
CHANNEL13 0;CHANNEL14 0;
CHANNEL15 0;CHANNEL16 0;
FREQUENCY 50;REFCYCLE 1;SYNC:
TRACE AUTO;HYSTERESIS HIGH

:TRIGger:WWINDOW:CHANNEL<x>

Function Sets the channel condition of the wave window trigger or queries the current setting.

Syntax **:TRIGger:WWINDOW:CHANNEL<x>**
{<Boolean>}
:TRIGger:WWINDOW:CHANNEL<x>?
<x>=1 to 16

Example (The following is an example for CH1.)
:TRIGGER:WWINDOW:CHANNEL1 ON
:TRIGGER:WWINDOW:CHANNEL1? ->
:TRIGGER:WWINDOW:CHANNEL1 1

:TRIGger:WWINDOW:FREQuency

Function Sets the cycle frequency of the wave window trigger or queries the current setting.

Syntax **:TRIGger:WWINDOW:FREQuency**
{<Frequency>}
:TRIGger:WWINDOW:FREQuency?
<Frequency>=40 to 1000 (Hz)

Example **:TRIGGER:WWINDOW:FREQUENCY 100HZ**
:TRIGGER:WWINDOW:FREQUENCY? ->
:TRIGGER:WWINDOW:FREQUENCY 100

:TRIGger:WWINDOW:REFCYcle

Function Sets the reference cycle of the wave window trigger or queries the current setting.

Syntax **:TRIGger:WWINDOW:REFCYcle** {<NRF>}
:TRIGger:WWINDOW:REFCYcle?
<NRF>=1, 2, 4

Example **:TRIGGER:WWINDOW:REFCYCLE 2**
:TRIGGER:WWINDOW:REFCYCLE? ->
:TRIGGER:WWINDOW:REFCYCLE 2

:TRIGger:WWINDOW:SYNC?

Function Queries all settings related to the synchronization of the wave window trigger.

Syntax **:TRIGger:WWINDOW:SYNC?**

Example **:TRIGGER:WWINDOW:SYNC? ->**
:TRIGGER:WWINDOW:SYNC:TRACE AUTO;
HYSTERESIS HIGH

:TRIGger:WWINdow:SYNC:HYSTeresis

Function Sets the hysteresis of the synchronization channel of the wave window trigger or queries the current setting.

Syntax :TRIGger:WWINdow:SYNC:HYSTeresis
{HIGH|LOW|MIDDLE}
:TRIGger:WWINdow:SYNC:HYSTeresis?

Example :TRIGGER:WWINDOW:SYNC:
HYSTERESIS HIGH
:TRIGGER:WWINDOW:SYNC:HYSTERESIS?
-> :TRIGGER:WWINDOW:SYNC:
HYSTERESIS HIGH

:TRIGger:WWINdow:SYNC:LEVel

Function Sets the level of the synchronization channel of the wave window trigger or queries the current setting.

Syntax :TRIGger:WWINdow:SYNC:LEVel
{<Voltage>|<NRf>|<Current>}
:TRIGger:WWINdow:SYNC:LEVel?
{<Voltage>|<NRf>|<Current>}=See the *User's Manual*.

Example :TRIGGER:WWINDOW:SYNC:LEVEL 10
:TRIGGER:WWINDOW:SYNC:LEVEL? ->
:TRIGGER:WWINDOW:SYNC:LEVEL 10

Description Cannot be specified when
:TRIGger:WWINdow:SYNC:TRACe is set to
AUTO.

:TRIGger:WWINdow:SYNC:TRACe

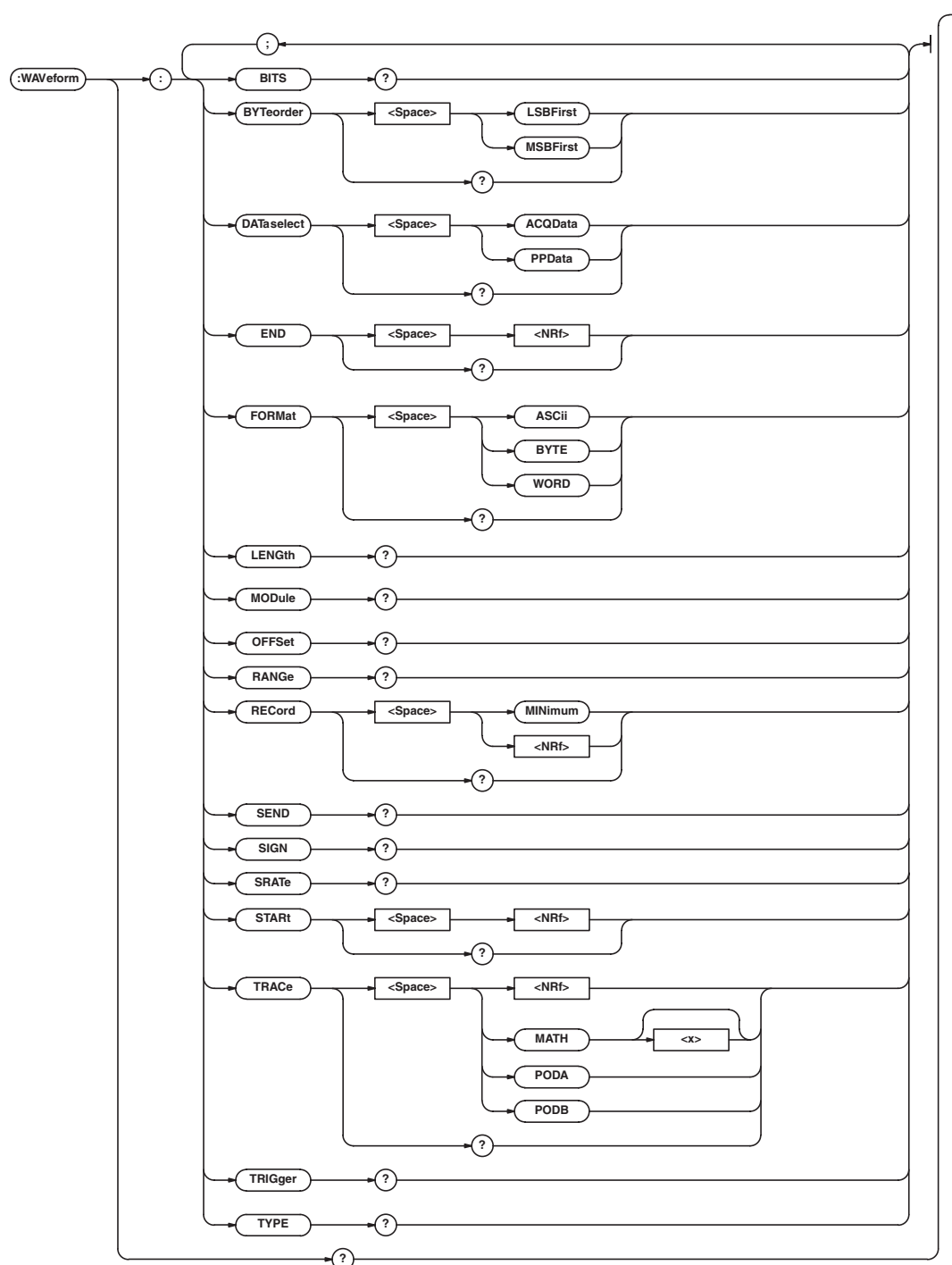
Function Sets the synchronization channel of the wave window trigger or queries the current setting.

Syntax :TRIGger:WWINdow:SYNC:TRACe
{<NRf>|AUTO}
:TRIGger:WWINdow:SYNC:TRACe?
<NRf>=1 to 16

Example :TRIGGER:WWINDOW:SYNC:TRACE AUTO
:TRIGGER:WWINDOW:SYNC:TRACE? ->
:TRIGGER:WWINDOW:SYNC:TRACE AUTO

6.30 WAVEform Group

The commands in this group deal with the acquired waveform data. There are no front panel keys that correspond to the commands in this group.



:WAVEform?

Function Queries all information about the waveform data.

Syntax :WAVEform?

Example :WAVEFORM? -> :WAVEFORM:TRACE 2;
RECORD 0;START 0;END 0;
DATASELECT ACQDATA;CAPTURE:
RECORD 0;START 0;END 0;:WAVEFORM:
FORMAT WORD;BYTEORDER LSBFIRST

:WAVEform:BITS?

Function Queries the bit length of the waveform data specified by ":WAVEform:TRACE".

Syntax :WAVEform:BITS?

Example :WAVEFORM:BITS? -> :WAVEFORM:BITS 16

:WAVEform:BYTeorder

Function Sets the transmission order when using word format of two bytes or more or queries the current setting.

Syntax :WAVEform:BYTeorder
{LSBFirst|MSBFirst}
:WAVEform:BYTeorder?

Example :WAVEFORM:BYTEORDER LSBFIRST
:WAVEFORM:BYTEORDER? -> :WAVEFORM:BYTEORDER LSBFIRST

:WAVEform:DATaselect

Function Sets whether to query the waveform specified by :WAVEform:TRACE using ACQ data or P-P data.

Syntax :WAVEform:DATaselect
{ACQData|PPData}
:WAVEform:DATaselect?

Example :WAVEFORM:DATASELECT ACQDATA
:WAVEFORM:DATASELECT? -> :WAVEFORM:DATASELECT ACQDATA

:WAVEform:END

Function Sets the last data point of the waveform (main waveform) specified by :WAVEform:TRACE or queries the current setting.

Syntax :WAVEform:END {<NRf>}
:WAVEform:END?

Example :WAVEFORM:END 0
:WAVEFORM:END? -> :WAVEFORM:END 0

Description The total number of data points can be queried using :WAVEform:LENGth?.

:WAVEform:FORMat

Function Sets the format of the data to be transmitted or queries the current setting.

Syntax :WAVEform:FORMat {AScii|BYTE|WORD}
:WAVEform:FORMat?

Example :WAVEFORM:FORMAT WORD
:WAVEFORM:FORMAT? -> :WAVEFORM:FORMAT WORD

Description For details on the differences in the format setting, see the description of :WAVEform:SEND?.

:WAVEform:LENGth?

Function Queries the total number of points of the waveform (main waveform) specified by :WAVEform:TRACE.

Syntax :WAVEform:LENGth?

Example :WAVEFORM:LENGTH? -> :WAVEFORM:LENGTH 10020

Description The total number of data points varies depending on the SL1400 setting. For details, see appendix 1, "Relationship between the Time Axis Setting, Sample Rate and Record Length" in the User's Manual.

:WAVEform:MODule?

Function Queries the module corresponding to the waveform specified by ":WAVEform:TRACE".

Syntax :WAVEform:MODule?

Example :WAVEFORM:MODULE? -> :WAVEFORM:MODULE M701250

Description The following values are returned from the module.

NOMODULE	No module
M701250	701250 (HS10M12)
M701251	701251 (HS1M16)
M701255	701255 (NONISO_10M12)
M701260	701260 (HV(with RMS))
M701261	701261 (Voltage/Temp.)
M701262	701262 (Voltage/Temp. with AAF)
M701265	701265 (TEMP/HPV)
M701270	701270 (STRAIN_NDIS)
M701271	701271 (STRAIN_DSUB)
M701275	701275 (ACCL/VOLT)
M701280	701280 (FREQ)

:WAVEform:OFFSet?

Function Queries the offset value used when converting the waveform data specified by :WAVEform:TRACE to physical values.

Syntax :WAVEform:OFFSet?

Example :WAVEFORM:OFFSET? -> :WAVEFORM:OFFSET 0.0000000E+00

Description This value is used when converting the <Block data> that is output using :WAVEform:SEND? to physical values.

:WAVEform:RANGe?

Function Queries the range value when converting the waveform data specified by :WAVEform:TRACE to physical values.

Syntax :WAVEform:RANGe?

Example :WAVEFORM:RANGE? -> :WAVEFORM:RANGE 50.0000000E+00

Description This value is used when converting the <Block data> that is output using :WAVEform:SEND? to physical values.

6.30 WAVEform Group

:WAVEform:RECORD

Function	Sets the target record number of the main waveform for the commands in the WAVEform group or queries the current setting.
Syntax	:WAVEform:RECORD {MINimum <NRf>} :WAVEform:RECORD? <NRf>=0 to -1999
Example	:WAVEFORM:RECORD 0 :WAVEFORM:RECORD? -> :WAVEFORM:RECORD 0
Description	Specifying "MINimum" sets the record to the minimum record number. The selectable record number varies depending on the memory extension and acquisition setting. For details, see the User's Manual.

:WAVEform:RECORD? MINimum

Function	Queries the minimum record number of the history of the target channel (main waveform).
Syntax	:WAVEform:RECORD? MINimum
Example	:WAVEFORM:RECORD? MINIMUM -> :WAVEFORM:RECORD -10

:WAVEform:SEND?

Function	Queries the waveform data (main waveform) specified by ":WAVEform:TRACe".
Syntax	:WAVEform:SEND? {<NRf>} <NRf> = 1 to 2000
Example	Varies depending on the record length setting. :WAVEform:SEND? -> #9(number of bytes, 9 digits)(series of data bytes) Or, <NRf>,<NRf>,...
Description	The output format of :WAVEform:SEND? varies depending on the :WAVEform:FORMAT setting. 1) When set to ASCII For the voltage module, the data is output as <Voltage>,<Voltage>,...,<Voltage>. When measuring temperature, the data is output as <Temperature>,<Temperature>,...,<Temperature>. The unit specified by :CHANnel<x>:TEMPerature:UNIT is used for the output. For the strain module, the data is output as <NRf>,<NRf>,...,<NRf>. For logic waveforms, the data is output as <NR1>,<NR1>,...,<NR1>. <NR1> is 8-bit bit pattern (LSB: bit 1, MSB: bit 8) expressed in decimal notation. For computed waveforms, the data is output as <NRf>,<NRf>,...,<NRf>. For acceleration measurements, the data is output as <NRf>,<NRf>,...,<NRf>. When measuring frequency on the frequency module, the data is output as <Frequency>,<Frequency>,...,<Frequency>. When measuring RPMs on the frequency module, the data is output as <NRf>,<NRf>,...,<NRf>. When measuring RPSs on the frequency module, the data is output as <NRf>,<NRf>,...,<NRf>. When measuring the period on the frequency module, the data is output as <Time>,<Time>,...,<Time>. When measuring duty cycle on the frequency

module, the data is output as

<NRf>,<NRf>,...,<NRf>.

When measuring the power frequency (PowerFreq) on the frequency module, the data is output as

<Frequency>,<Frequency>,...,<Frequency>.

When measuring the pulse width on the frequency module, the data is output as <Time>,<Time>,...,<Time>.

When performing pulse integration (PulseInteg) on the frequency module, the data is output as <NRf>,<NRf>,...,<NRf>.

When measuring velocity on the frequency module, the data is output as <NRf>,<NRf>,...,<NRf>.

2) When set to BYTE or WORD

The data is output using the <Block data> format on all modules.

The data consists of signed values except for the logic module.

For voltage modules, the data can be converted to voltage using the following equation.

$$\text{Voltage} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of

:WAVEform:RANGE?

Offset=The return value of

:WAVEform:OFFSet?

When measuring temperature, the data can be converted to temperature using the following equation.

$$\text{Temperature (}^{\circ}\text{C)} = \text{Data} \times \text{Division}$$

BYTE: Division = 25.6

WORD: Division = 0.1

In the case of a strain module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: 187.5

WORD: 48000

Range=The return value of

:WAVEform:RANGE?

Offset=The return value of

:WAVEform:OFFSet?

For logic waveforms, the following format is used.

BYTE: 8-bit bit pattern (LSB: bit1, MSB: bit 8)

WORD: 16-bit bit pattern (upper 8 bits are PODB, lower 8 bits are the same as the PODA bit pattern)

For computed waveforms, the data can be converted using the following equation.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

For acceleration measurements, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

When measuring frequency on the frequency module, the following equation is used to make a conversion to frequency.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

When measuring RPMs on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

When measuring RPSs on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

When measuring the period on the frequency module, the following equation is used to make a conversion to time.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

When measuring duty cycle on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

When measuring the power frequency (PowerFreq) on the frequency module, the following equation is used to make a conversion to frequency.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

When measuring the pulse width on the frequency module, the following equation is used to make a conversion to time.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

When performing pulse integration (PulseInteg) on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75
 WORD: Division = 24000
 Range=The return value of
 :WAVEform:RANGE?
 Offset=The return value of
 :WAVEform:OFFSet?

6.30 WAVEform Group

When measuring velocity on the frequency module, the following equation is used to make a conversion.

$$\text{Value} = \frac{\text{Range} \times \text{data} \times 10}{\text{Division}} + \text{Offset}$$

BYTE: Division = 93.75

WORD: Division = 24000

Range=The return value of

:WAVEform:RANGE?

Offset=The return value of

:WAVEform:OFFSet?

- <NRf> can be omitted. If <NRf> is attached, waveform data is queried <NRf> times in order from the record number specified by "WAVEform:CAPture:RECOrd" - <NRf>.

:WAVEform:SIGN?

Function Queries the existence of a sign when querying the waveform data specified by :WAVEform:TRACe using block data.

Syntax :WAVEform:SIGN?

Example :WAVEFORM:SIGN? -> :WAVEFORM:SIGN 1

Description When the target waveform is a logic module waveform, 0 is returned. For all other waveforms, 1 is returned.

:WAVEform:SRATe? (Sample RATE)

Function Queries the sample rate of the record specified by :WAVEform:RECOrd.

Syntax :WAVEform:SRATe?

Example :WAVEFORM:SRATE? -> :WAVEFORM:SRATE 5.0E+03

:WAVEform:STARt

Function Sets the first data point of the waveform (main waveform) specified by :WAVEform:TRACe or queries the current setting.

Syntax :WAVEform:STARt {<NRf>}

:WAVEform:STARt?

<NRf>=0 to (total number of data points - 1)

Example :WAVEFORM:START 0

:WAVEFORM:START? -> :WAVEFORM:START 0

Description The total number of data points can be queried using :WAVEform:LENGth?.

:WAVEform:TRACe

Function Sets the target waveform or queries the current setting.

Syntax :WAVEform:TRACe {<NRf>|MATH<x>|PODA|PODB}

:WAVEform:TRACe?

<NRf>=1 to 16

MATH<x>=1 to 8

Example :WAVEFORM:TRACE 1

:WAVEFORM:TRACE? -> :WAVEFORM:TRACE 1

Description An error occurs, if a module is not installed in the channel (slot).

:WAVEform:TRIGger?

Function Queries the trigger position of the record specified by :WAVEform:RECOrd.

Syntax :WAVEform:TRIGger?

Example :WAVEFORM:TRIGGER? -> :WAVEFORM:TRIGGER 50005

Description Queries the number of points from the first point of the record to the trigger position.

:WAVEform:TYPE?

Function Queries the acquisition mode of the waveform specified by :WAVEform:TRACe.

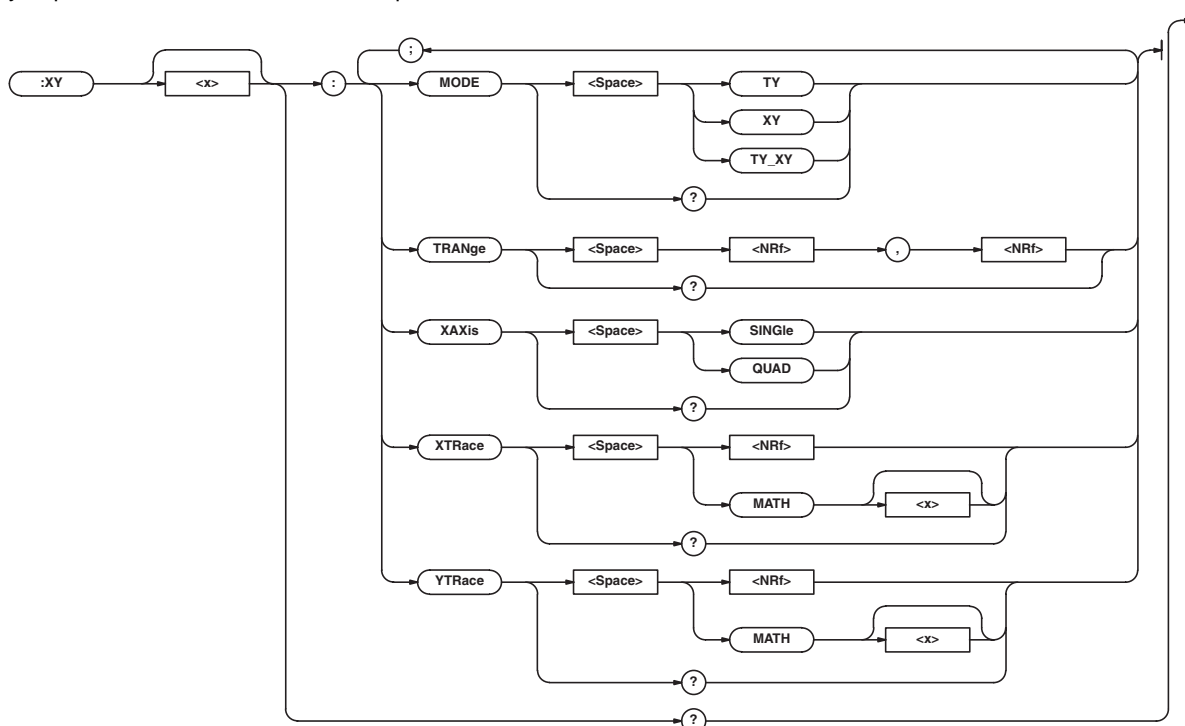
Syntax :WAVEform:TYPE?

Example :WAVEFORM:TYPE? -> :WAVEFORM:TYPE NORMAL

Description AVERage, ENVelope, BAVerage, or NORMAl is returned.

6.31 XY Group

The commands in this group deal with the XY display. You can make the same settings and inquiries as when you press the DISPLAY on the front panel.



:XY<x>?

Function Queries all settings related to the X-Y display.

Syntax :XY<x>?
<x>=1 to 4

Example :XY1? -> :XY1:MODE XY;XAXIS SINGLE;
DISPLAY 1;TRANGE -5.00,5.00;
XTRACE 1;YTRACE 2

:XY<x>:MODE

Function Sets the display mode or queries the current setting.

Syntax :XY<x>:MODE {TY|TY_XY|XY}
:XY<x>:MODE?
<x>=1 to 4

Example :XY1:MODE XY
:XY1:MODE? -> :XY1:MODE XY

Description The same setting or query is performed regardless of the <x> value (any value from 1 to 4).

:XY<x>:TRANGE

Function Sets the range of the T-Y waveform to be displayed on the X-Y display or queries the current setting.

Syntax :XY<x>:TRANGE {<NRf>,<NRf>}
:XY<x>:TRANGE?
<x>=1 to 4
<NRf>=-5 to 5 divisions (10 divisions/record length steps)

Example :XY1:TRANGE -4,4
:XY1:TRANGE? -> :XY1:
TRANGE -4.00,4.00

Description The same setting or query is performed regardless of the <x> value (any value from 1 to 4).

:XY<x>:XAXIS

Function Sets whether to make the channel assigned to the X-axis of the X-Y display common (SINGLE) or separate (QUAD) or queries the current setting.

Syntax :XY<x>:XAXIS {SINGLE|QUAD}
:XY<x>:XAXIS?
<x>=1 to 4

Example :XY1:XAXIS SINGLE
:XY1:XAXIS? -> :XY1:XAXIS SINGLE

Description The same setting or query is performed regardless of the <x> value (any value from 1 to 4).

:XY<x>:XTRACE

Function Sets the channel to assign to the X-axis of the X-Y display or queries the current setting.

Syntax :XY<x>:XTRACE {<NRf>|MATH<x>}
:XY<x>:XTRACE?
<x> of XY<x>=1 to 4
<NRf>=1 to 16
<x> of MATH<x>=1 to 8

Example :XY1:XTRACE 1
:XY1:XTRACE? -> :XY1:XTRACE 1

Description There is a limitation on the channels that can be specified when :XY<x>:XAXIS is set to QUAD.

6.31 XY Group

:XY<x>:YTRace

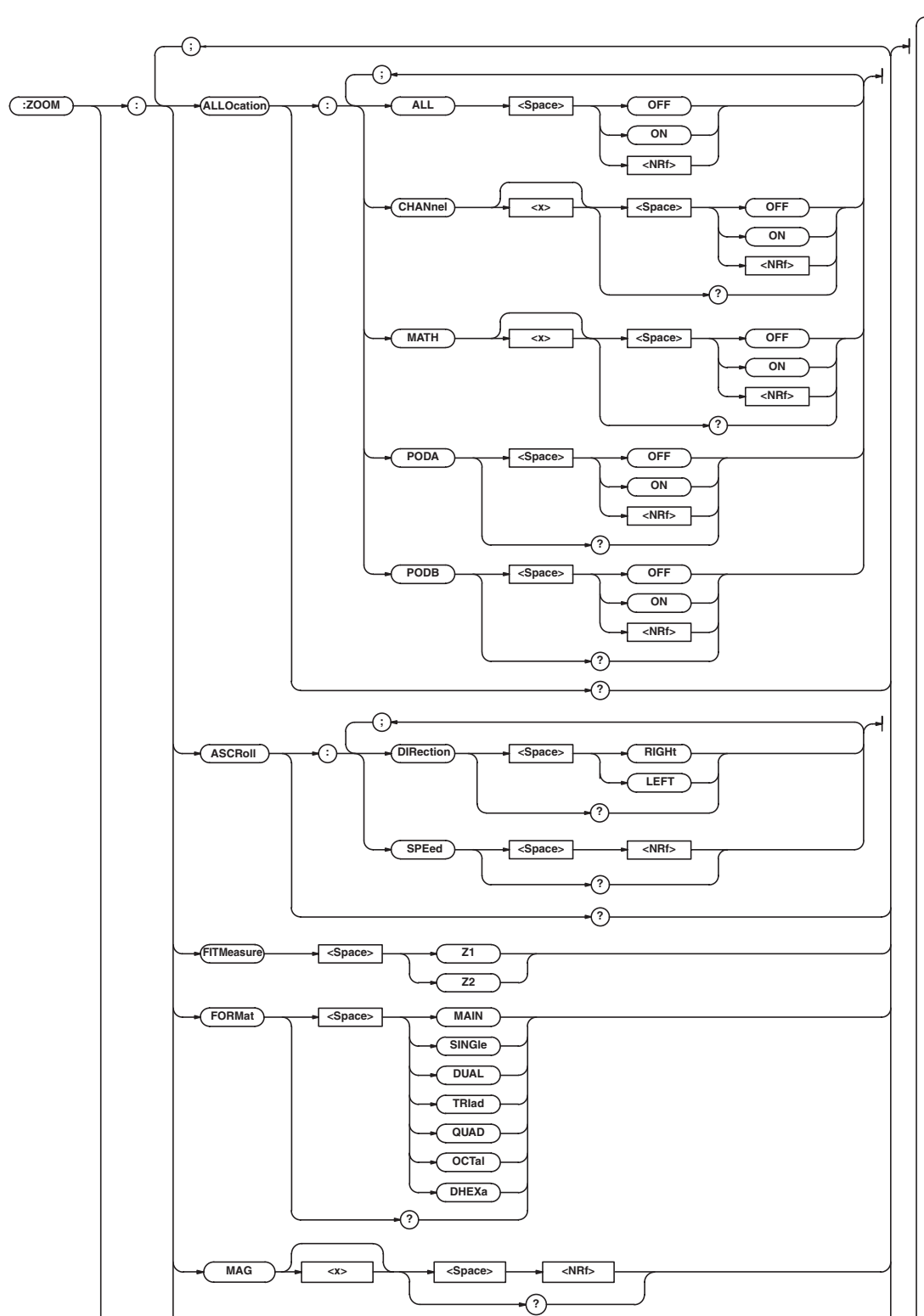
Function	Sets the channel to assign to the Y-axis of the X-Y display or queries the current setting.
Syntax	<code>:XY<x>:YTRace {<NRf> MATH<x>}</code> <code>:XY<x>:YTRace?</code> <x> of XY<x>=1 to 4 <NRf>=1 to 16 <x> of MATH<x>=1 to 8<x>
Example	<code>:XY1:YTRACE 1</code> <code>:XY1:YTRACE? -> :XY1:YTRACE 1</code>
Description	This command is valid when <code>:XY<x>:XAXis</code> is set to QUAD. There is a limitation on the channels that can be specified.

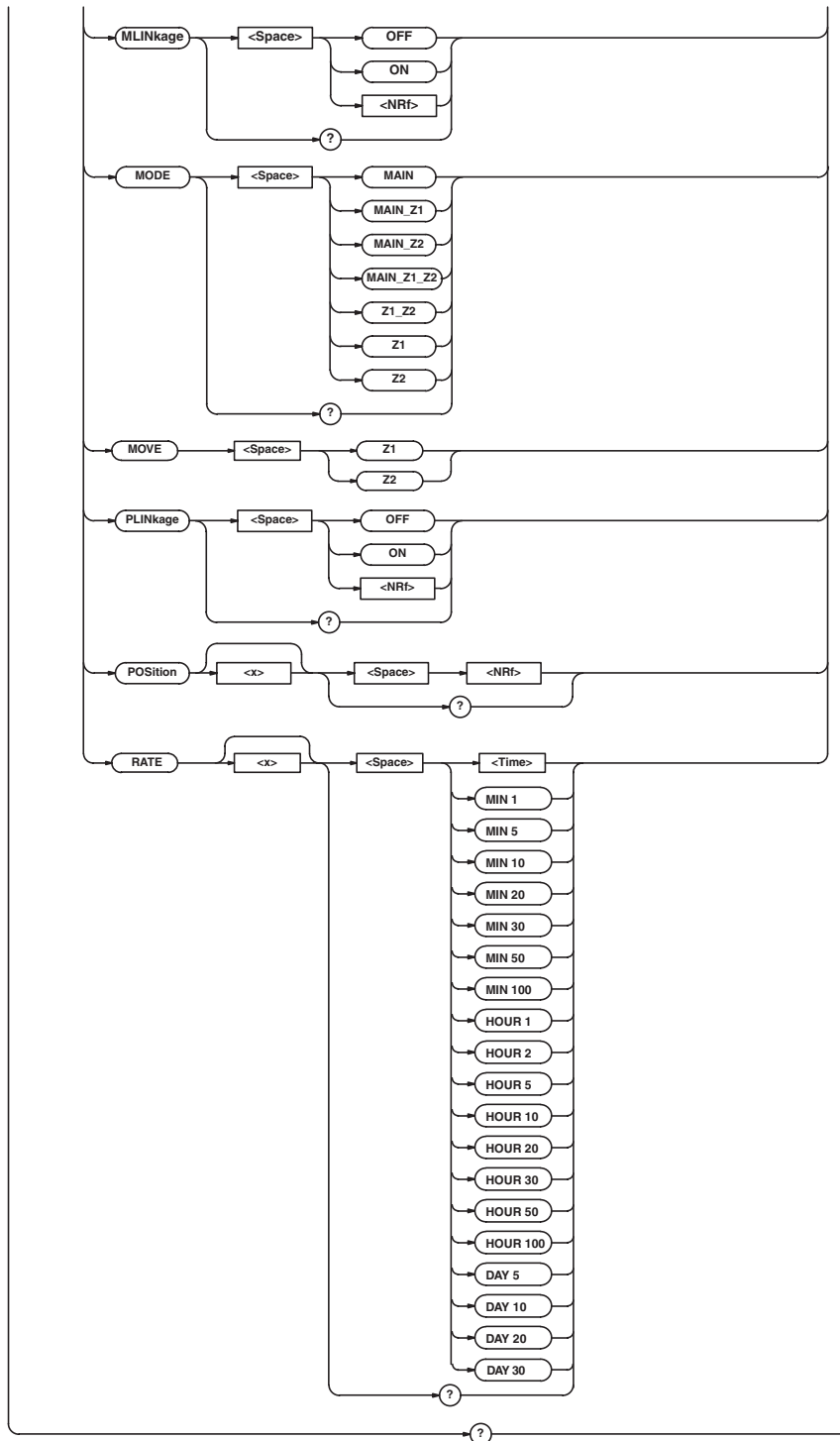
6.32 ZOOM Group

The commands in this group deal with the ZOOM display. You can make the same settings and inquiries as when ZOOM on the front panel is used.

When the time axis is set to a range indicated below, the selectable range varies depending on the record length setting. For details, see section 11.5, "Measuring Waveforms Using Cursors" in the *SL1400 User's Manual*.

<NRf>=-5 to 5div





:ZOOM?

Function Queries all settings related to the waveform zoom.

Syntax :ZOOM?

Example :ZOOM? -> :ZOOM:MODE MAIN_Z1;
 FORMAT MAIN;ALLOCATION:CHANNEL1 1;
 CHANNEL2 1;CHANNEL3 1;CHANNEL4 1;
 CHANNEL5 1;CHANNEL6 1;CHANNEL7 1;
 CHANNEL8 1;CHANNEL9 1;CHANNEL10 1;
 CHANNEL11 1;CHANNEL12 1;
 MATH1 0;MATH2 0;MATH3 0;MATH4 0;
 MATH5 0;MATH6 0;MATH7 0;MATH8 0;
 PODA 0;PODB 0;:ZOOM:MLINKAGE 0;
 TDIV2 10.00E-03;PLINKAGE 0;
 POSITION1 0.0000000;
 POSITION2 0.0000000

:ZOOM:ALLOCATION?

Function Queries all settings related to the zoom target waveform.

Syntax :ZOOM:ALLOCATION?

Example :ZOOM:ALLOCATION? -> :ZOOM:
 ALLOCATION:CHANNEL1 1;CHANNEL2 1;
 CHANNEL3 1;CHANNEL4 1;CHANNEL5 1;
 CHANNEL6 1;CHANNEL7 1;CHANNEL8 1;
 CHANNEL9 1;CHANNEL10 1;CHANNEL11 1;
 CHANNEL12 1;CHANNEL13 1;
 CHANNEL14 1;CHANNEL15 1;
 CHANNEL16 1;MATH1 0;MATH2 0;
 MATH3 0;MATH4 0;MATH5 0;MATH6 0;
 MATH7 0;MATH8 0;PODA 0;PODB 0

:ZOOM:ALLOCATION:ALL

Function Sets all waveforms to be zoomed.

Syntax :ZOOM:ALLOCATION:ALL {<Boolean>}

Example :ZOOM:ALLOCATION:ALL ON

**:ZOOM:ALLOCATION:{CHANNEL<x>|
MATH<x>|PODA|PODB}**

Function Sets the zoom target waveform or queries the current setting.

Syntax :ZOOM:ALLOCATION:{CHANNEL<x>|
 MATH<x>|PODA|PODB} {<Boolean>}
 :ZOOM:ALLOCATION:{CHANNEL<x>|
 MATH<x>|PODA|PODB}?
 <x> of CHANNEL<x>=1 to 16
 <x> of MATH<x>=1 to 8

Example :ZOOM:ALLOCATION:CHANNEL1 ON
 :ZOOM:ALLOCATION:CHANNEL1? ->
 :ZOOM:ALLOCATION:CHANNEL1 1

Description An error occurs, if a module is not installed in the channel (slot).

:ZOOM:ASCROLL?

Function Queries all settings related to the auto scroll function.

Syntax :ZOOM:ASCROLL?

Example :ZOOM:ASCROLL? ->
 :ZOOM:ASCROLL:DIRECTION RIGHT;
 SPEED 4

:ZOOM:ASCROLL:DIRECTION

Function Sets the scroll direction of the auto scroll function or queries the current setting.

Syntax :ZOOM:ASCROLL:DIRECTION {LEFT|
 RIGHT}

Example :ZOOM:ASCROLL:DIRECTION?
 :ZOOM:ASCROLL:DIRECTION LEFT
 :ZOOM:ASCROLL:DIRECTION? ->
 :ZOOM:ASCROLL:DIRECTION LEFT

:ZOOM:ASCROLL:SPEED

Function Sets the scroll speed of the auto scroll function or queries the current setting.

Syntax :ZOOM:ASCROLL:SPEED {<Nrf>}
 :ZOOM:ASCROLL:SPEED?

{Nrf} = 1 to 10

Example :ZOOM:ASCROLL:SPEED 1
 :ZOOM:ASCROLL:SPEED? ->
 :ZOOM:ASCROLL:SPEED 1

:ZOOM:FITMEASURE

Function Moves the range of the automated measurement of waveform parameters to the ends of the zoom box.

Syntax :ZOOM:FITMEASURE {Z1|Z2}

Example :ZOOM:FITMEASURE Z1

:ZOOM:FORMAT

Function Sets the zoom waveform display format or queries the current setting.

Syntax :ZOOM:FORMAT
 {MAIN|SINGLE|DUAL|TRIad|QUAD|OCTal|
 DHEXa}
 :ZOOM:FORMAT?

Example :ZOOM:FORMAT SINGLE
 :ZOOM:FORMAT? -> :ZOOM:
 FORMAT SINGLE

Description SINGLE, DUAL, TRIad, QUAD, OCTal, and DHEXa correspond to 1 ZONE, 2 ZONE, 3 ZONE, 4 ZONE, 8 ZONE, and 16 ZONE, respectively.

:ZOOM:MAG<x>

Function Sets the zoom rate of the zoom window or queries the current setting.

Syntax :ZOOM:MAG<x> {<Nrf>}
 :ZOOM:MAG<x>?
 <x>=1 or 2
 <Nrf>=1 to 100000000 (see the *User's Manual*)

Example :ZOOM:MAG1 10
 :ZOOM:MAG1? -> :ZOOM:MAG1 10.0

Description When zooming a waveform measured using the external clock, set the magnification.

:ZOOM:MLINKAGE (Mag Linkage)

Function Turns ON/OFF the link to the T/div value of the zoom waveform or queries the current setting.

Syntax :ZOOM:MLINKAGE {<Boolean>}
 :ZOOM:MLINKAGE?

Example :ZOOM:MLINKAGE ON
 :ZOOM:MLINKAGE? -> :ZOOM:MLINKAGE 1

6.32 ZOOM Group

:ZOOM:MODE

Function Sets the zoom waveform display format or queries the current setting.

Syntax `:ZOOM:MODE {MAIN|MAIN_Z1|MAIN_Z2|MAIN_Z1_Z2|Z1_Z2|Z1|Z2}`
`:ZOOM:MODE?`

Example `:ZOOM:MODE MAIN_Z1_Z2`
`:ZOOM:MODE? -> :ZOOM:MODE`
`MAIN_Z1_Z2`

:ZOOM:MOVE

Function Moves the zoom box to the beginning of the waveform.

Syntax `:ZOOM:MOVE {Z1|Z2}`

Example `:ZOOM:MOVE Z1`

:ZOOM:PLINKage (Position Linkage)

Function Turns ON/OFF the link when moving the zone box or queries the current setting.

Syntax `:ZOOM:PLINKage {<Boolean>}`
`:ZOOM:PLINKage?`

Example `:ZOOM:PLINKAGE ON`
`:ZOOM:PLINKAGE? -> :ZOOM:PLINKAGE 1`

:ZOOM:POSition<x>

Function Sets the zoom box position or queries the current setting.

Syntax `:ZOOM:POSition<x> {<NRf>}`
`:ZOOM:POSition<x>?`
`<x>=1 or 2`
`<NRf>=-5 to 5div`

Example `:ZOOM:POSITION1 0`
`:ZOOM:POSITION1? -> :ZOOM:`
`POSITION1 0.0000000`

:ZOOM:RATE<x>

Function Sets the magnification of the zoom waveform in terms of time or queries the current setting.

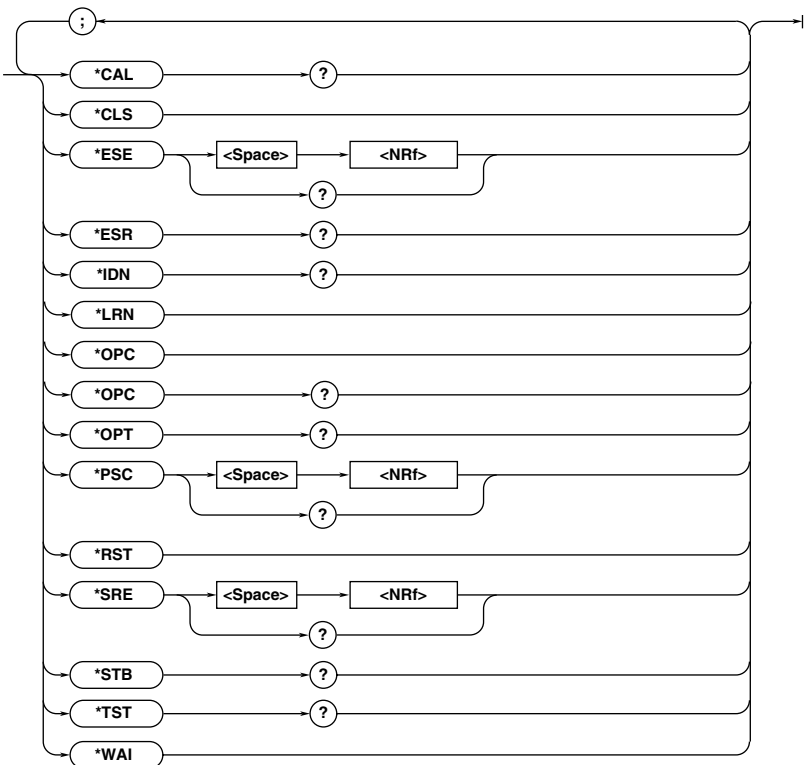
Syntax `:ZOOM:RATE<x> {<Time>|MIN1|MIN5|MIN10|MIN20|MIN30|MIN50|MIN100|HOUR1|HOUR2|HOUR5|HOUR10|HOUR20|HOUR30|HOUR50|HOUR100|DAY5|DAY10|DAY20|DAY30}`
`:ZOOM:RATE<x>?`
`<x>=1 or 2`
`<Time> = See the SL1400 User's Manual.`

Example `:ZOOM:RATE1 1MS`
`:ZOOM:RATE1? -> :ZOOM:`
`RATE1 1.000E-03`

Description When zooming waveforms measured using the internal clock, the magnification is set in terms of time.

6.33 Common Command Group

The commands in the common group are defined in the IEEE 488.2-1987 and are independent of the instrument's functions. There are no front panel keys that correspond to the commands in this group.



*CAL? (CALibrate)

Function Performs calibration and queries the result.
Syntax *CAL?
Example *CAL? -> 0
Description If the calibration terminates normally, "0" is returned. If an error is detected, "1" is returned.

*CLS (CLear Status)

Function Clears the standard event register, extended event register, and error queue.
Syntax *CLS
Example *CLS
Description

- If the *CLS command is located immediately after the program message terminator, the output queue is also cleared.
- For details on the register and queue, see chapter 7.

*ESE (standard Event Status Enable register)

Function Sets the standard event enable register or queries the current setting.
Syntax *ESE {<Nrf>}
 *ESE?
 <Nrf>=0 to 255
Example *ESE 251
 *ESE? -> 251
Description

- Specify the value as a sum of decimal values of each bit.
- For example, specifying "**ESE 251" will cause the standard enable register to be set to "11111011." In this case, bit 2 of the standard event register is disabled which means that bit 5 (ESB) of the status byte register is not set to "1," even if a "query error" occurs.
- The default value is "**ESE 0" (all bits disabled).
- A query using *ESE? will not clear the contents of the standard event enable register.
- For details on the standard event enable register, see page 7-3.

6.33 Common Command Group

***ESR? (standard Event Status Register)**

Function	Queries the standard event register and clears the register.
Syntax	*ESR?
Example	*ESR? -> 32
Description	• A sum of decimal values of each bit is returned. • You can check what type of events occurred when an SRQ is generated. • For example, if a value of "32" is returned, this indicates that the standard event register is set to "00100000." In this case, you can see that the SRQ occurred due to a "command syntax error." • A query using *ESR? will clear the contents of the standard event register. • For details on the standard event register, see page 7-3.

***IDN? (IDeNtify)**

Function	Queries the instrument model.
Syntax	*IDN?
Example	*IDN? -> YOKOGAWA,701240,0,F1.10
Description	The information is returned in the following form: <Manufacturer>,<Model>,<Serial No.>,<Firmware version> In actuality, <Serial No.> is not returned (always 0).

***LRN? (LeaRN)**

Function	Queries collectively the current settings of the following command groups. ACQuire, CHANnel<x>, TIMEbase, TRIGger
Syntax	*LRN?
Example	*LRN? -> :ACQUIRE:RLENGTH 10000; MODE NORMAL;PROTATE 1;AVERAGE: COUNT INFINITY;EWEIGHT 16;:ACQUIRE:COUNT INFINITY; CLOCK INTERNAL;RTOUT:MODE OFF;ANAMING DATE;FILENAME ""; COMMENT ""::CHANNEL1:DISPLAY 1; VOLTAGE:VDIV 50.000E+00;VARIABLE 0; COUPLING DC;PROBE 10;BWIDTH FULL; SCALE 250.000E+00,-250.000E+00; POSITION 0.00;LSCALE:MODE OFF; AVALUE 1.00000E+00; BVALUE 0.00000E+00;P1X 0.00000E+00; P1Y 0.00000E+00;P2X 1.00000E+00; P2Y 1.00000E+00;UNIT "";DISPLAYTYPE: MODE EXPONENT;DECIMALNUM AUTO; SUBUNIT AUTO;:CHANNEL1:VOLTAGE: ZOOM 1.000;INVERT 0;OFFSET 0.0E+00;: CHANNEL1:TEMPERATURE:COUPLING DC;: CHANNEL1:LABEL "CH1";:CHANNEL2: DISPLAY 1;VOLTAGE:VDIV 50.000E+00; VARIABLE 0;COUPLING DC;PROBE 10; BWIDTH FULL;SCALE 250.000E+00, -250.000E+00;POSITION 0.00; LSCALE:MODE OFF;AVALUE 1.00000E+00; BVALUE 0.00000E+00;P1X 0.00000E+00; P1Y 0.00000E+00;P2X 1.00000E+00; P2Y 1.00000E+00;UNIT ""; DISPLAYTYPE:MODE EXPONENT; DECIMALNUM AUTO;SUBUNIT AUTO;: CHANNEL2:VOLTAGE:ZOOM 1.000; INVERT 0;OFFSET 0.0E+00;:CHANNEL2:

```
TEMPERATURE:COUPLING DC;:  
CHANNEL2:LABEL "CH2";:CHANNEL3:  
DISPLAY 1;VOLTAGE:VDIV 50.000E+00;  
VARIABLE 0;COUPLING DC;PROBE 10;  
BWIDTH FULL;SCALE 250.000E+00,  
-250.000E+00;POSITION 0.00;LSCALE:  
MODE OFF;AVALUE 1.00000E+00;  
BVALUE 0.00000E+00;P1X 0.00000E+00;  
P1Y 0.00000E+00;P2X 1.00000E+00;  
P2Y 1.00000E+00;UNIT "";  
DISPLAYTYPE:MODE EXPONENT;  
DECIMALNUM AUTO;SUBUNIT AUTO;:  
CHANNEL3:VOLTAGE:ZOOM 1.000;  
INVERT 0;OFFSET 0.0E+00;:CHANNEL3:  
TEMPERATURE:COUPLING DC;:CHANNEL3:  
LABEL "CH3";:CHANNEL4:DISPLAY 1;  
VOLTAGE:VDIV 50.000E+00;VARIABLE 0;  
COUPLING DC;PROBE 10;BWIDTH FULL;  
SCALE 250.000E+00,-250.000E+00;  
POSITION 0.00;LSCALE:MODE OFF;  
AVALUE 1.00000E+00;  
BVALUE 0.00000E+00;P1X 0.00000E+00;  
P1Y 0.00000E+00;P2X 1.00000E+00;  
P2Y 1.00000E+00;UNIT "";  
DISPLAYTYPE:MODE EXPONENT;  
DECIMALNUM AUTO;SUBUNIT AUTO;:  
CHANNEL4:VOLTAGE:ZOOM 1.000;  
INVERT 0;OFFSET 0.0E+00;:CHANNEL4:  
TEMPERATURE:COUPLING DC;:CHANNEL4:  
LABEL "CH4";:CHANNEL5:DISPLAY 1;  
VOLTAGE:VDIV 50.000E+00;VARIABLE 0;  
COUPLING DC;PROBE 10;BWIDTH FULL;  
SCALE 250.000E+00,-250.000E+00;  
POSITION 0.00;LSCALE:MODE OFF;  
AVALUE 1.00000E+00;  
BVALUE 0.00000E+00;P1X 0.00000E+00;  
P1Y 0.00000E+00;P2X 1.00000E+00;  
P2Y 1.00000E+00;UNIT "";  
DISPLAYTYPE:MODE EXPONENT;  
DECIMALNUM AUTO;SUBUNIT AUTO;:  
CHANNEL5:VOLTAGE:ZOOM 1.000;  
INVERT 0;OFFSET  
0.0E+00;:CHANNEL5:TEMPERATURE:COUPLING  
DC;:CHANNEL5:LABEL "CH5";:CHANNEL6:  
DISPLAY 1;VOLTAGE:VDIV 50.000E+00;  
VARIABLE 0;COUPLING DC;PROBE 10;  
BWIDTH FULL;SCALE 250.000E+00,  
-250.000E+00;POSITION 0.00;LSCALE:  
MODE OFF;AVALUE 1.00000E+00;  
BVALUE 0.00000E+00;P1X 0.00000E+00;  
P1Y 0.00000E+00;P2X 1.00000E+00;  
P2Y 1.00000E+00;UNIT "";  
DISPLAYTYPE:MODE EXPONENT;  
DECIMALNUM AUTO;SUBUNIT AUTO;:  
CHANNEL6:VOLTAGE:ZOOM 1.000;  
INVERT 0;OFFSET 0.0E+00;:CHANNEL6:  
TEMPERATURE:COUPLING DC;:CHANNEL6:  
LABEL "CH6";:EVENT:DISPLAY 0;  
POSITION 0.00;ZOOM 1.000;VOICE 0;  
DCAPTURE 1;LABEL "Event";:LOGIC:  
PODA:DISPLAY 0;POSITION 0.00;  
ZOOM 1.000;LABEL "LogicA";BIT1:  
DISPLAY 1;LABEL "A-1";:LOGIC:PODA:  
BIT2:DISPLAY 1;LABEL "A-2";:LOGIC:  
PODA:BIT3:DISPLAY 1;LABEL "A-3";:  
LOGIC:PODA:BIT4:DISPLAY 1;  
LABEL "A-4";:LOGIC:PODA:BIT5:  
DISPLAY 1;LABEL "A-5";:
```



```

LOGIC:PODA:BIT6:DISPLAY 1;
LABEL "A-6";:LOGIC:PODA:BIT7:
DISPLAY 1;LABEL "A-7";:LOGIC:
PODA:BIT8:DISPLAY 1;LABEL "A-8";:
LOGIC:PODA:BMAPPING AUTO;:LOGIC:
PODB:DISPLAY 0;POSITION 0.00;
ZOOM 1.000;LABEL "LogicB";BIT1:
DISPLAY 1;LABEL "B-1";:LOGIC:PODB:
BIT2:DISPLAY 1;LABEL "B-2";:LOGIC:
PODB:BIT3:DISPLAY 1;LABEL "B-3";:
LOGIC:PODB:BIT4:DISPLAY 1;
LABEL "B-4";:LOGIC:PODB:BIT5:
DISPLAY 1;LABEL "B-5";:LOGIC:PODB:
BIT6:DISPLAY 1;LABEL "B-6";:LOGIC:
PODB:BIT7:DISPLAY 1;LABEL "B-7";:
LOGIC:PODB:BIT8:DISPLAY 1;
LABEL "B-8";:LOGIC:PODB:
BMAPPING AUTO;:TIMEBASE:
SOURCE INTERNAL;TDIV 100.0E-03;:
TRIGGER:ACTION:MODE 0;HCOPY 0;
IMAGE 0;SAVE 0;BUZZER 0;
SEQUENCE CONTINUE;:TRIGGER:SIMPLE:
SOURCE 1;LEVEL 0.0E+00;
HYSTERESIS LOW;SLOPE RISE;LOGIC:
BIT 1;SLOPE RISE;:TRIGGER:ABN:
COUNT 1;:TRIGGER:ADB:DELAY 0.0E+00;:
TRIGGER:MODE AUTO;EOA:channel1 OFF;
CHANNEL2 RISE;CHANNEL3 OFF;
CHANNEL4 OFF;CHANNEL5 OFF;
CHANNEL6 OFF;PODA DISABLE;
PODB DISABLE;CONDITION TRUE;:
TRIGGER:OR:CHANNEL1 RISE;
CHANNEL2 OFF;CHANNEL3 OFF;
CHANNEL4 OFF;CHANNEL5 OFF;
CHANNEL6 OFF;PODA DISABLE;
PODB DISABLE;:TRIGGER:TYPE SIMPLE;
BGTIME:TIME 100.000E-09;:TRIGGER:
BLTIME:TIME 100.000E-09;:TRIGGER:
BTOUT:TIME 100.000E-09;:TRIGGER:
TGTIME:TIME 100.000E-09;:TRIGGER:
TLTIME:TIME 100.000E-09;:TRIGGER:
TTIME:TIME1 100.000E-09;
TIME2 200.000E-09;:TRIGGER:TOTIME:
TIME1 100.000E-09;
TIME2 200.000E-09;:TRIGGER:TIMER:
DATE "2002/01/01";TIME "00:00:00";
INTERVAL HOUR1;:TRIGGER:WINDOW:
CHANNEL1 IN;CHANNEL2 OFF;
CHANNEL3 OFF;CHANNEL4 OFF;
CHANNEL5 OFF;CHANNEL6 OFF;
PODA DISABLE;PODB DISABLE;:TRIGGER:
HOLDOFF:TIME 0.0E+00;:TRIGGER:
SOURCE:CHANNEL1:LEVEL 0.0E+00;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
CHANNEL2:LEVEL 0.0E+00;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
CHANNEL3:LEVEL 0.0E+00;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
CHANNEL4:LEVEL 0.0E+00;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
CHANNEL5:LEVEL 0.0E+00;
HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
CHANNEL6:LEVEL 0.0E+00;

```

```

HYSTERESIS LOW;CENTER 0.0E+00;
WIDTH 50.000E+00;:TRIGGER:SOURCE:
LOGIC:A1 RISE;A2 DONTCARE;
A3 DONTCARE;A4 DONTCARE;A5 DONTCARE;
A6 DONTCARE;A7 DONTCARE;A8 DONTCARE;
B1 DONTCARE;B2 DONTCARE;B3 DONTCARE;
B4 DONTCARE;B5 DONTCARE;B6 DONTCARE;
B7 DONTCARE;B8 DONTCARE;
:TRIGGER:ATRIGGER:CHANNEL1 HIGH;
CHANNEL2 DONTCARE;CHANNEL3 DONTCARE;
CHANNEL4 DONTCARE;CHANNEL5 DONTCARE;
CHANNEL6 DONTCARE;PODA DISABLE;
PODB DISABLE;LOGIC:A1 DONTCARE;
A2 HIGH;A3 DONTCARE;A4 DONTCARE;
A5 DONTCARE;A6 DONTCARE;A7 DONTCARE;
A8 DONTCARE;B1 DONTCARE;B2 DONTCARE;
B3 DONTCARE;B4 DONTCARE;B5 DONTCARE;
B6 DONTCARE;B7 DONTCARE;
B8 DONTCARE;:TRIGGER:ATRIGGER:
CONDITION ENTER;:TRIGGER:BTRIGGER:
CHANNEL1 DONTCARE;CHANNEL2 HIGH;
CHANNEL3 DONTCARE;CHANNEL4 DONTCARE;
CHANNEL5 DONTCARE;CHANNEL6 DONTCARE;
PODA DISABLE;PODB DISABLE;LOGIC:
A1 HIGH;A2 DONTCARE;A3 DONTCARE;
A4 DONTCARE;A5 DONTCARE;A6 DONTCARE;
A7 DONTCARE;A8 DONTCARE;B1 DONTCARE;
B2 DONTCARE;B3 DONTCARE;B4 DONTCARE;
B5 DONTCARE;B6 DONTCARE;B7 DONTCARE;
B8 DONTCARE;:TRIGGER:BTRIGGER:
CONDITION ENTER;:TRIGGER:
DELAY 0.0E+00;POSITION 50.000;
SCOUNT 1

```

***OPC (Operation Complete)**

Function Sets a "1" to bit 0 (OPC bit) of the standard event register bit upon the completion of the specified overlap command.

Syntax *OPC

Example *OPC

Description

- For the description regarding how to synchronize the program using *OPC, see page 5-7.
- The COMMunicate:OPSE command is used to specify the overlap command.
- If *OPC is not the last command of the message, the operation is not guaranteed.

***OPC? (Operation Complete)**

Function If *OPC? is transmitted and the specified overlap command is completed, ASCII code "1" is returned.

Syntax *OPC?

Example *OPC? -> 1

Description

- For the description regarding how to synchronize the program using *OPC?, see page 5-7.
- The COMMunicate:OPSE command is used to specify the overlap command.
- If *OPC? is not the last command of the message, the operation is not guaranteed.

6.33 Common Command Group

*OPT? (OPTION)

Function Queries the installed options.
Syntax *OPT?
Example *OPT? -> CH25MW,PCCARD,HD,ETHER,USERDEFINE,PROBEPower
Description

- Returns the presence of <Channel>, <HD>, <User-defined equation>, and <32-bit extended logic input>
- The *OPT? query must be the last query of the program message. An error occurs if there is a query after this query.

*PSC (Power-on Status Clear)

Function Sets whether or not to clear the registers below at power on or queries the current setting. The register is cleared when the value rounded to an integer is a non-zero value.

- Standard event enable register
- Extended event enable register
- Transition filter

Syntax *PSC {<NRf>}
*PSC?
<NRf>=0(not clear), non-zero (clear)
Example *PSC 1
*PSC? -> 1
Description For details on the registers, see chapter 7.

*RST (ReSet)

Function Collectively initializes the current settings of the following command groups.
ACCumulate, ACQuire, CHANnel<x>, TIMEbase, TRIGger
Syntax *RST
Example *RST
Description Also clears *OPC and *OPC? commands that have been sent earlier.

*SRE (Service Request Enable register)

Function Sets the service request enable register or queries the current setting.
Syntax *SRE <NRf>
*SRE?
<NRf>=0 to 255
Example *SRE 239
*SRE? -> 175
Description

- Specify the value as a sum of decimal values of each bit.
- For example, specifying “*SRE 239” will cause the service request enable register to be set to “11101111.” In this case, bit 4 of the service request enable register is disabled which means that bit 4 (MAV) of the status byte register is not set to “1,” even if “the output queue is not empty.”
- Bit 6 (MSS) of the status byte register is the MSS bit itself, and therefore, is ignored.
- The default value is “*SRE 0” (all bits disabled).
- A query using *SRE? will not clear the contents of the service request enable register.
- For details on the service request enable register, see page 7-1.

*STB? (Status Byte)

Function Queries the status byte register.
Syntax *STB?
Example *STB? -> 4
Description

- The sum of the bits is returned as a decimal value.
- Since the register is read without executing serial polling, bit 6 is a MSS bit not RQS.
- For example, if a value of “4” is returned, this indicates that the status byte register is set to “00000100.” In this case, you can see that “the error queue is not empty” (an error occurred).
- A query using *STB? will not clear the contents of the status byte register.
- For details on the status byte register, see page 7-2.

*TST?

Function Performs a self-test and queries the result. The self test involves internal memory tests.
Syntax *TST?
Example *TST? -> 0
Description “0” is returned if the self test is successful, “1” if it is not.

*WAI (WAIt)

Function Holds the subsequent command until the completion of the specified overlap operation.
Syntax *WAI
Example *WAI
Description

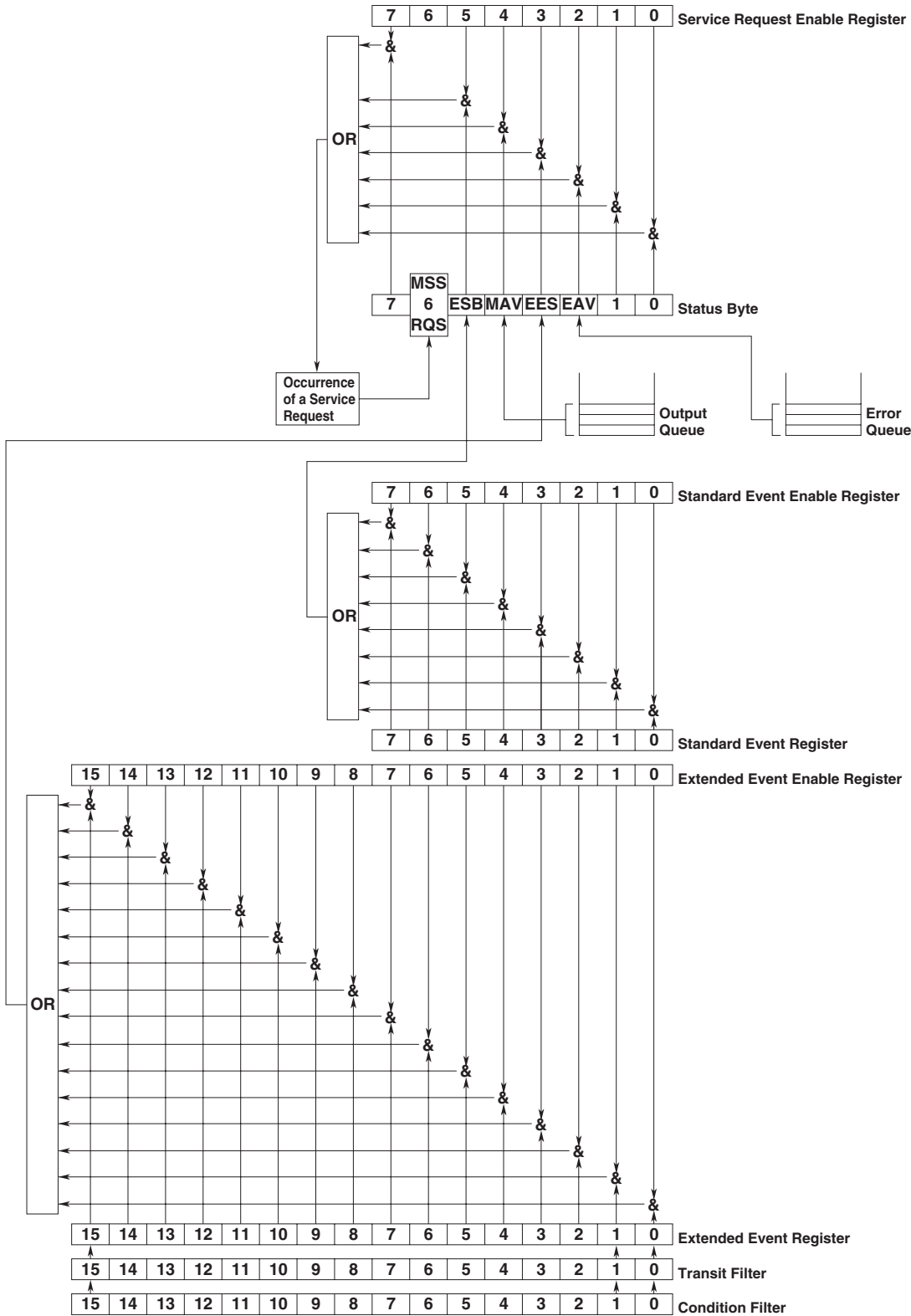
- For the description regarding how to synchronize the program using *WAI, see page 5-7.
- The COMMunicate:OPSE command is used to specify the overlap command.

Chapter 7 Status Report

7.1 Overview of the Status Report

Status Report

The figure below shows the status report which is read by a serial poll. This is an extended version of the one specified in IEEE 488.2-1992.



7.1 Overview of the Status Report/7.2 Status Byte

Overview of Registers and Queues

Name	Function	Writing	Reading
Status byte		—	Serial poll (RQS), *STB?(MSS)
Service request enable register	Masks status byte.	*SRE	*SRE?
Standard event register	Change in device status	—	*ESR?
Standard event enable register	Masks standard event register	*ESE	*ESE?
Extended event register	Change in device status	—	STATUS:EESR?
Extended event enable register	Masks standard event register	STATUS:ESEE	STATUS:ESEE?
Condition register	Current instrument status	—	STATUS:CONDition?
Transit filter	Extended event occurrence conditions	STATUS:FILTER<x>	STATUS:FILTER<x>?
Output queue	Stores response message to a query.	All executable queues	
Error queue	Stores error Nos. and messages.	—	STATUS:ERROR?

Registers and Queues which Affect the Status Byte

Registers which affect each bit of the status byte are shown below.

Standard event register	: Sets bit 5 (ESB) of status byte to "1" or "0."
Output queue	: Sets bit 4 (MAV) of status byte to "1" or "0."
Extended event register	: Sets bit 3 (EES) of status byte to "1" or "0."
Error queue	: Sets bit 2 (EAV) of status byte to "1" or "0."

Enable Registers

Registers which mask a bit so that the bit does not affect the status byte, even if the bit is set to "1," are shown below.

Status byte	: Masks bits using the service request enable register.
Standard event register	: Masks bits using the standard event enable register.
Extended event register	: Masks bits using the extended event enable register.

Writing/Reading from Registers

The *ESE command is used to set bits in the standard event enable register to "1" or "0," and the *ESE query is used to check whether bits in that register are set to "1" or "0." For details of these commands, refer to Chapter 6.

7.2 Status Byte

Overview of Status Byte



Bits 0, 1 and 7

Not used (always "0")

Bit 2 EAV (Error Available)

Set to "1" when the error queue is not empty, i.e. when an error occurs. For details, refer to page 7-5.

Bit 3 EES (Extended Event Summary Bit)

Sets to "1" when the logical "AND" of an Extended Event Register bit and the corresponding Enable Register bit is equal to "1."—that is, when an event takes place in the instrument. Refer to page 7-4.

Bit 4 MAV (Message Available)

Set to "1" when the output queue is not empty, i.e. when there is data which is to be output when a query is made. Refer to page 7-5.

Bit 5 ESB (Event Summary Bit)

Set to "1" when the logical AND of the standard event register and the corresponding enable register is "1," i.e. when an event takes place in the instrument. Refer to page 7-3.

Bit 6 RQS (Request Status)/MSS (Master Summary Status)

Sets to "1" when the logical "AND" of any one of the Status Byte bits (other than bit 6) and the corresponding Service Request Enable Register bit becomes "1"—that is, when the instrument is requesting service from the controller.

RQS is set to "1" when MSS changes from "0" to "1," and is cleared when a serial poll is performed or when MSS changes to "0."

Bit Masking

To mask a bit in the status byte so that it does not cause an SRQ, set the corresponding bit of the service request enable register to "0."

For example, to mask bit 2 (EAV) so that no service will be requested, even if an error occurs, set bit 2 of the service request enable register to "0." This can be done using the *SRE command. To query whether each bit of the service request enable register is "1" or "0," use *SRE?. For details of the *SRE command, refer to Chapter 6.

Operation of the Status Byte

A service request is issued when bit 6 of the status byte becomes "1." Bit 6 becomes "1" when any of the other bits becomes "1" (or when the corresponding bit in the service request enable register becomes "1").

For example, if an event takes place and the logical OR of each bit of the standard event register and the corresponding bit in the enable register is "1," bit 5 (ESB) will be set to "1." In this case, if bit 5 of the service request enable register is "1," bit 6 (MSS) will be set to "1," thus requesting service from the controller.

It is also possible to check what type of event has occurred by reading the contents of the status byte.

Reading from the Status Byte

The following two methods are provided for reading the status byte.

- **Inquiry Using the *STB? Query**
Making an query using the *STB? query sets bit 6 to MSS. This causes the MSS to be read. After completion of the read-out, none of the bits in the status byte will be cleared.
- **Serial Poll**
Execution of a serial poll changes bit 6 to RQS. This causes RQS to be read. After completion of the read-out, only RQS is cleared. Using a serial poll, it is not possible to read MSS.

Clearing the Status Byte

No method is provided for forcibly clearing all the bits in the status byte. Bits which are cleared are shown below.

- **When an Query is Made Using the *STB? Query**
No bit is cleared.
- **When a Serial Poll is Performed**
Only the RQS bit is cleared.
- **When the *CLS Command is Received**
When the *CLS command is received, the status byte itself is not cleared, but the contents of the standard event register (which affects the bits in the status byte) are cleared. As a result, the corresponding bits in the status byte are cleared, except bit 4 (MAV), since the output queue cannot be emptied by the *CLS command. However, the output queue will also be cleared if the *CLS command is received just after a program message terminator.

7.3 Standard Event Register

Overview of the Standard Event Register

7	6	5	4	3	2	1	0
PON	URQ	CME	EXE	DDE	QYE	RQC	OPC

Bit 7 PON (Power ON)

Bit 7 PON (Power ON) Set to "1" when power is turned ON

Bit 6 URQ (User Request)

Not used (always "0")

Bit 5 CME (Command Error)

Set to "1" when the command syntax is incorrect.

Examples: Incorrectly spelled command name; "9" used in octal data.

Bit 4 EXE (Execution Error)

Set to "1" when the command syntax is correct but the command cannot be executed in the current state.

Examples: Parameters are outside the setting range; an attempt is made to make a hard copy during acquisition.

Bit 3 DDE (Device Dependent Error)

Set to "1" when execution of the command is not possible due to an internal problem in the instrument that is not a command error or an execution error.

Example: The circuit breaker is reset.

Bit 2 QYE (Query Error)

Set to "1" if the output queue is empty or if the data is missing even after a query has been sent.

Examples: No response data; data is lost due to an overflow in the output queue.

Bit 1 RQC (Request Control)

Not used (always "0")

Bit 0 OPC (Operation Complete)

Set to "1" when the operation designated by the *OPC command has been completed. Refer to Chapter 6.

Bit Masking

To mask a bit in the standard event register so that it does not cause bit 5 (ESB) of the status byte to change, set the corresponding bit in the standard event enable register to "0."

For example, to mask bit 2 (QYE) so that ESB will not be set to "1," even if a query error occurs, set bit 2 of the standard event enable register to "0." This can be done using the *ESE command. To inquire whether each bit of the standard event enable register is "1" or "0," use the *ESE?. For details of the *ESE command, refer to Chapter 6.

7.3 Standard Event Register/7.4 Extended Event Register

Operation of the Standard Event Register

The standard event register is provided for eight different kinds of event which can occur inside the instrument. Bit 5 (ESB) of the status byte is set to "1" when any of the bits in this register becomes "1" (or when the corresponding bit of the standard event enable register becomes "1").

Examples

1. A query error occurs.
2. Bit 2 (QYE) is set to "1".
3. Bit 5 (ESB) of the status byte is set to "1" if bit 2 of the standard event enable register is "1".

It is also possible to check what type of event has occurred inside the instrument by reading the contents of the standard event register.

Reading from the Standard Event Register

The contents of the standard event register can be read by the *ESR command. After completion of the read-out, the register will be cleared.

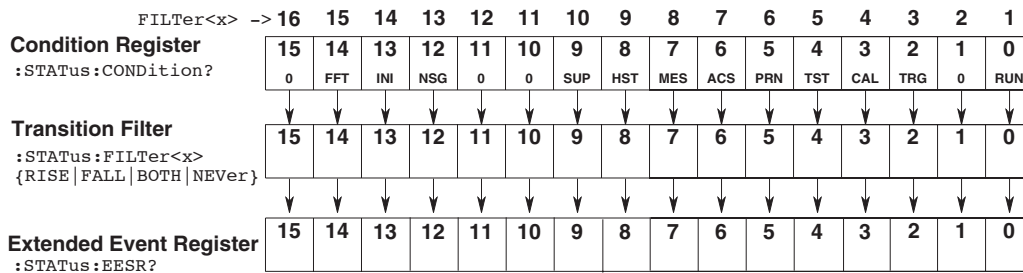
Clearing the Standard Event Register

The standard event register is cleared in the following three cases.

- When the contents of the standard event register are read using *ESR?
- When the *CLS command is received
- When power is turned ON again

7.4 Extended Event Register

Reading the extended event register tells you whether changes in the condition register (reflecting internal conditions) have occurred. A filter can be applied which allows you to decide which events are reported to the extended event register.



The meaning of each bit of the condition register is as follows.

Bit 0 RUN (Running)	Set to "1" during acquisition.
Bit 2 TRG (Awaiting Trigger)	Set to "1" when waiting for a trigger.
Bit 3 CAL (Calibrating)	Set to "1" during calibration.
Bit 4 TST (Testing)	Set to "1" during self-test.
Bit 5 PRN (Printing)	Set to "1" while the internal printer is in operation, data is being output to the external printer (USB or network printer), or screen image data is being stored.
Bit 6 ACS (Accessing)	Set to "1" while the floppy disk, Zip disk, PC card, internal hard disk, or external disk drive (SCSI or network devices) is being accessed.
Bit 7 MES (Measuring)	Set to "1" when automated measurement of waveform parameters or cursor measurement is in progress.
Bit 8 HST (History Search)	Set to "1" while executing history search.
Bit 9 SUP (Set-up)	Set to "1" during auto set-up.
Bit 12 NSG (N-Single)	Set to "1" during continuous acquisition when the trigger mode is set to single (N).
Bit 13 INI (Initializing)	Sets to "1" during initialization.
Bit 14 FFT	Set to "1" while performing the FFT.

The filter is applied to each bit of the condition register separately, and can be selected from the following.

Note that the numbering of the bits used in the filter setting differs from the actual bit number (1 to 16 vs. 0 to 15).

Rise	The bit of the extended event register becomes "1" when the bit of the condition register changes from "0" to "1".
Fall	The bit of the extended event register becomes "1" when the bit of the condition register changes from "1" to "0".
Both	The bit of the extended event register becomes "1" when the bit of the condition register changes from "0" to "1", or from "1" to "0".
Never	The bit of the extended event register is disabled and always "0".

7.5 Output Queue and Error Queue

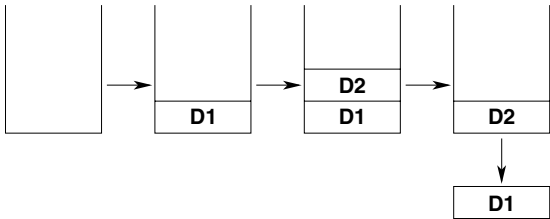
Overview of the Output Queue

The output queue is provided to store response messages to queries. For example, when the :WAVEform:SEND? query is sent to request output of the acquired waveform, the response data will be stored in the output queue until it is read out.

The example below shows that data is stored record by record in the output queue, and is read out oldest item first, newest item last. The output queue is emptied in the following cases (in addition to when read-out is performed).

- When a new message is received from the controller
- When dead lock occurs (page 5-2)
- When a device clear command (DCL or SDC) is received
- When power is turned ON again

The output queue cannot be emptied using the *CLS command. To see whether the output queue is empty or not, check bit 4 (MAV) of the status byte.



Overview of the Error Queue

The error queue stores the error No. and message when an error occurs. For example, if the controller sends an incorrect program message, the number, "113, "Undefined header"," and the error message are stored in the error queue, when the error is displayed. The contents of the error queue can be read using the :STATus:ERRor? query. As with the output queue, messages are read oldest first, newest last (refer to the previous page).

If the error queue becomes full, the final message will be replaced by message "350, "Queue overflow"."

The error queue is emptied in the following cases (in addition to when read-out is performed).

- When the *CLS command is received
- When power is turned ON again

To see whether the error queue is empty or not, check bit 2 (EAV) of the status byte.

Chapter 8 Sample Program

Notes on Use of the Sample Program

Yokogawa shall accept no responsibility whatsoever for any problems occurring as a result of use of the sample program.

8.1 Before Programming

Environment

Model: MS-DOS/V Computer
 Language: Visual Basic Version 6.0 Professional Edition or higher
 GP-IB board: PCI-GPIB IEEE-488.2 board from National Instruments.

Setting up the Visual Basic

Component: MSComm
 Standardmodule: Niglobal.bas
 Vbib-32.bas

Setting up the SL1400

GP-IB

All the sample programs given in this chapter use address 1 for the SL1400, so be sure to assign the instrument to address 1 as described on page 1-6.

Serial (RS-232)

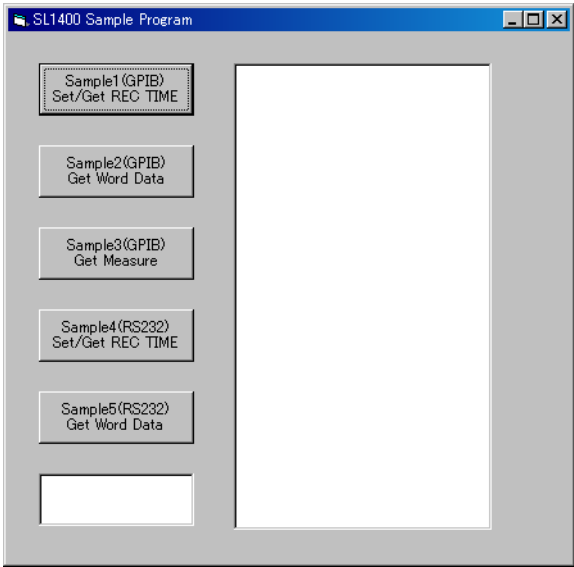
All the sample programs in this chapter assume the below settings, so be sure to set parameters as described on page 2-8.

Baud Rate: 19200
 Handshake: CTS-RTS
 Parity Check: NO
 Stop Bit: 1
 Character Length: 8
 Terminator: LF

Note

The sample programs can be downloaded from the following Web page.
<http://www.yokogawa.com/tm/software/>

8.2 Image of Sample Program



8.3 Initialize/Error/Execute

```

Option Explicit
Dim StartFlag As Integer           'Start Flag
Dim TimerCount As Integer          'Timeout(RS232)
Dim addr As Integer                'GPiB Address
Dim Timeout As Integer             'Timeout
Dim Dev As Integer                 'Device ID(GPiB)
Dim CtsFlag As Integer             'CTS Flag
Dim term As String                 'Terminator
Dim Query(3) As String             'Query String
Dim WaveBuffer(20070) As Integer   'WaveData Buffer(GPiB)
Dim Dummy As Integer

Private Function InitGpib() As Integer
    Dim eos As Integer              'EOS
    Dim eot As Integer              'EOI
    Dim brd As Integer              'GPiB Board ID
    Dim sts As Integer

    eos = &HCOA                     'Terminator = LF
    eot = 1                          'EOI = Enable
    term = Chr(10)
    Timeout = T10s                   'Timeout = 10s

    brd = ilfind("GPiB0")
    If (brd < 0) Then
        Call DisplayGPiBError(brd, "ilfind")
        InitGpib = 1
        Exit Function
    End If
    Dev = ildev(0, addr, 0, Timeout, eot, eos)
    If (Dev < 0) Then
        Call DisplayGPiBError(Dev, "ildev")
        InitGpib = 1
        Exit Function
    End If
    sts = ilsic(brd)                  'Set IFC
    If (sts < 0) Then
        Call DisplayGPiBError(sts, "ilsic")
        InitGpib = 1
        Exit Function
    End If
    InitGpib = 0
End Function

Private Function InitSerial() As Integer
    Dim rat As String

    MSComm1.CommPort = 1              'Port = COM1

    rat = "19200,N,8,1"               'Rate = 19200, NoParity, 8Bit, 1Stopbit

    MSComm1.Settings = rat

    MSComm1.Handshaking = comRTS      'Handshake = CTS-RTS
    MSComm1.RTSEnable = True          'RTS = TRUE
    CtsFlag = 1
    term = Chr(10)                    'Terminator = LF
    Timeout = 10                      'Timeout = 10s
    InitSerial = 0
End Function

Private Sub DisplayGPiBError(ByVal sts As Integer, ByVal msg As String)
    Dim wrn As String
    Dim ers As String
    Dim ern As Integer

    If (sts And TIMO) Then
        wrn = "Time out" + Chr(13)
    Else
        wrn = ""
    End If
    If (sts And EERR) Then
        ern = iberr
        If (ern = EDVR) Then
            ers = "EDVR:System error"
        ElseIf (ern = ECIC) Then
            ers = "ECIC:Function requires GPiB board to be CIC"
        ElseIf (ern = ENOL) Then
            ers = "ENOL:No Listeners on the GPiB"
        ElseIf (ern = EADR) Then
            ers = "EADR:GPiB board not addressed correctly"
        ElseIf (ern = EARG) Then
            ers = "EARG:Invalid argument to function call"
        ElseIf (ern = ESAC) Then
            ers = "ESAC:GPiB board not System Controller as required"
        ElseIf (ern = EABO) Then
            ers = "EABO:I/O operation aborted(timeout)"
        ElseIf (ern = ENEB) Then
            ers = "ENEB:Nonexistent GPiB board"
        ElseIf (ern = EDMA) Then
            ers = "EDMA:DMA error"
        End If
    End If

```

8.3 Initialize/Error/Execute

```
ElseIf (ern = EOIP) Then
    ers = "EOIP:I/O operation started before previous operation completed"
ElseIf (ern = ECAP) Then
    ers = "ECAP:No capability for intended operation"
ElseIf (ern = EFSO) Then
    ers = "EFSO:File system operation error"
ElseIf (ern = EBUS) Then
    ers = "EBUS:GPIB bus error"
ElseIf (ern = ESTB) Then
    ers = "ESTB:Serial poll status byte queue overflow"
ElseIf (ern = ESRQ) Then
    ers = "ESRQ:SRQ remains asserted"
ElseIf (ern = ETAB) Then
    ers = "ETAB:The return buffer is full"
ElseIf (ern = ELCK) Then
    ers = "ELCK:Address or board is locked"
Else
    ers = ""
End If
Else
    ers = ""
End If

MsgBox ("Status No. " + Str(sts) + Chr(13) + wrn + "Error No. " + Str(ern) + Chr(13)
+ ers + Chr(13) + msg), vbExclamation, "Error!"
Call ibonl(Dev, 0)
Dev = -1
End Sub
Private Sub DisplayRS232Error(ByVal erm As String, Optional ByVal msg As String = "")
    MsgBox (erm + Chr(13) + msg), vbExclamation, "Error!"
End Sub
-----
Private Sub Command1_Click()
    Dim sts As Integer

    If (StartFlag = 1) Then
        Exit Sub
    End If
    StartFlag = 1
    Text1.Text = "START"
    List1.Clear
    Dummy = DoEvents()
    sts = GPIBRectime 'Run Sample1(GPIB) Set/Get TDIV
    If (sts = 0) Then
        List1.AddItem Query(0)
    End If
    Text1.Text = "END"
    StartFlag = 0
End Sub
Private Sub Command2_Click()
    Dim sts As Integer

    If (StartFlag = 1) Then
        Exit Sub
    End If
    StartFlag = 1
    Text1.Text = "START"
    List1.Clear
    Dummy = DoEvents()
    sts = GpibGetWord 'Run Sample2(GPIB) Get Word Data
    If (sts = 0) Then
        List1.AddItem "END"
    End If
    Text1.Text = "END"
    StartFlag = 0
End Sub
Private Sub Command3_Click()
    Dim sts As Integer

    If (StartFlag = 1) Then
        Exit Sub
    End If
    StartFlag = 1
    Text1.Text = "START"
    List1.Clear
    Dummy = DoEvents()
    sts = GpibGetMeasure 'Run Sample3(GPIB) Get Measure
    If (sts = 0) Then
        List1.AddItem Query(0)
        List1.AddItem Query(1)
        List1.AddItem Query(2)
    ElseIf (sts = 2) Then
        List1.AddItem "Waiting for Trigger!"
    End If
    Text1.Text = "END"
    StartFlag = 0
End Sub
Private Sub Command4_Click()
    Dim sts As Integer

    If (StartFlag = 1) Then
        Exit Sub
```

```

End If
StartFlag = 1
Text1.Text = "START"
List1.Clear
sts = RS232Rectime
If (sts = 0) Then
    List1.AddItem Query(0)
End If
Text1.Text = "END"
StartFlag = 0
End Sub
Private Sub Command5_Click()
    Dim sts As Integer

    If (StartFlag = 1) Then
        Exit Sub
    End If
    StartFlag = 1
    Text1.Text = "START"
    List1.Clear
    sts = RS232GetWord
    If (sts = 0) Then
        List1.AddItem "END"
    End If
    Text1.Text = "END"
    StartFlag = 0
End Sub
Private Sub Form_Load()

    StartFlag = 0
    Dev = -1
    addr = 1
    Timer1.Interval = 0
    Command1.Caption = "Sample1(GPIB)" + Chr(13) + "Set/Get RECTIME"
    Command2.Caption = "Sample2(GPIB)" + Chr(13) + "Get Word Data"
    Command3.Caption = "Sample3(GPIB)" + Chr(13) + "Get Measure"
    Command4.Caption = "Sample4(RS232)" + Chr(13) + "Set/Get RECTIME"
    Command5.Caption = "Sample5(RS232)" + Chr(13) + "Get Word Data"
    Text1.Text = ""

    'Clear Start Flag
    'Clear device id
    'GPIB Address = 1

End Sub
Private Sub MSComm1_OnComm()
    Dim evt As Integer

    evt = MSComm1.CommEvent
    Select Case evt
    'Error
        Case comBreak
            Call DisplayRS232Error("comBreak:Break received")
        Case comCDTO
            Call DisplayRS232Error("comCDTO CD(RLSD) timeout")
        Case comCTSTO
            Call DisplayRS232Error("comCTSTO:CTS timeout")
        Case comDSRTO
            Call DisplayRS232Error("commDSRTO:DSR timeout")
        Case comFrame
            Call DisplayRS232Error("comFrame:Frame error")
        Case comOverrun
            Call DisplayRS232Error("comOverrun:Overrun")
        Case comRxOver
            Call DisplayRS232Error("comRxOver:Receive buffer overflow")
        Case comRxParity
            Call DisplayRS232Error("commRxParity:Parity error")
        Case comTxFull
            Call DisplayRS232Error("comTxFull:Send buffer overflow")
    'Event
        Case comEvReceive
        Case comEvCD
        Case comEvCTS
        Case comEvDSR
        Case comEvRing
        Case comEvSend
    End Select

End Sub
Private Sub Timer1_Timer()
    TimerCount = TimerCount + 1
End Sub

```

8.4 Sets/Queries the Record Time

```

Sample1(GPIB) Set/Get RECTIME
-----
Private Function GpibRectime() As Integer
    Dim msg As String           'Command buffer
    Dim qry As String           'Query buffer
    Dim sts As Integer

    msg = Space$(100)
    qry = Space$(100)

    sts = InitGpib               'Initialize GPIB
    If (sts <> 0) Then
        GPIBRectime = 1
        Exit Function
    End If

    msg = "TIMEBASE:RECTIME 2ms" + term    'Set Rectime = 2ms
    sts = ilwrt(Dev, msg, Len(msg))        'Send Command
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GPIBRectime = 1
        Exit Function
    End If
    msg = "TIMEBASE:RECTIME?" + term        'Get Rectime value
    sts = ilwrt(Dev, msg, Len(msg))        'Send Command
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GPIBRectime = 1
        Exit Function
    End If
    sts = ilrd(Dev, qry, Len(qry))          'Receive Query
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GPIBRectime = 1
        Exit Function
    End If
    Query(0) = Left(qry, ibcntl - 1)
    Call ibonl(Dev, 0)
    GPIBRectime = 0
End Function
-----

Sample4(RS232) Set/Get RECTIME
-----
Private Function RS232Rectime() As Integer
    Dim msg As String           'Command buffer
    Dim qry As String           'Query buffer
    Dim sts As Integer

    msg = Space$(100)
    qry = CStr(Empty)

    sts = InitSerial             'Initialize RS232
    If (sts <> 0) Then
        Exit Function
    End If

    MSComm1.InputLen = 0         'Receive All Data
    MSComm1.InputMode = comInputModeText 'Text Mode
    MSComm1.PortOpen = True      'Port Open
    MSComm1.OutBufferCount = 0    'Out Buffer Clear
    MSComm1.InBufferCount = 0     'In Buffer Clear
    Timer1.Interval = 1000

    If CtsFlag = 1 Then          'If CTS = FALSE
        TimerCount = 1          'Wait until CTS = TRUE
        Do
            Dummy = DoEvents()
            If (TimerCount >= Timeout) Then
                Call DisplayRS232Error("CTS Timeout")
                RS232Rectime = 1
                GoTo finish
            End If
        Loop Until MSComm1.CTSHolding = True
    End If

    msg = "TIMEBASE:RECTIME 2ms" + term    'Set Rectime = 2 ms
    MSComm1.Output = msg                   'Send Command

    TimerCount = 1
    Do                                     'Wait until OutBufferCount = 0
        Dummy = DoEvents()
        If (TimerCount >= Timeout) Then
            Call DisplayRS232Error("Send Timeout", msg)
            RS232Rectime = 1
            GoTo finish
        End If
    Loop Until MSComm1.OutBufferCount = 0

```

```

msg = "TIMEBASE:RETIME?" + term           'Get Rectime value
MSComm1.Output = msg                     'Send Command

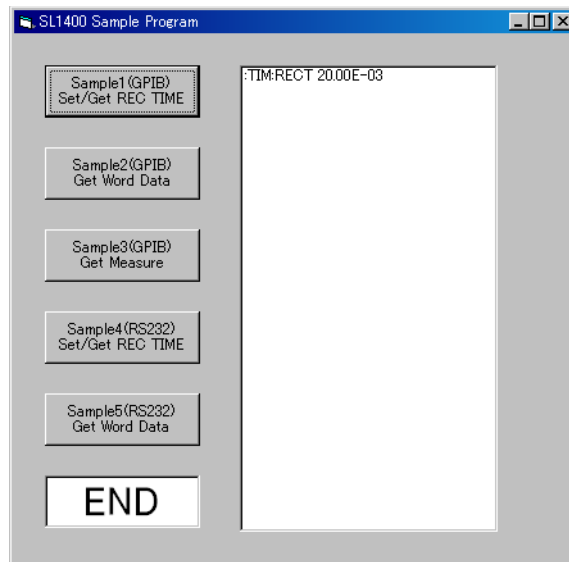
TimerCount = 1
Do                                     'Wait until OutBufferCount = 0
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232Rectime = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

TimerCount = 1
Do                                     'Receive Query
    qry = qry + MSComm1.Input             'Wait until End Data = Terminator
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Receive Timeout", msg)
        RS232Rectime = 1
        GoTo finish
    End If
Loop Until Right$(qry, 1) = term

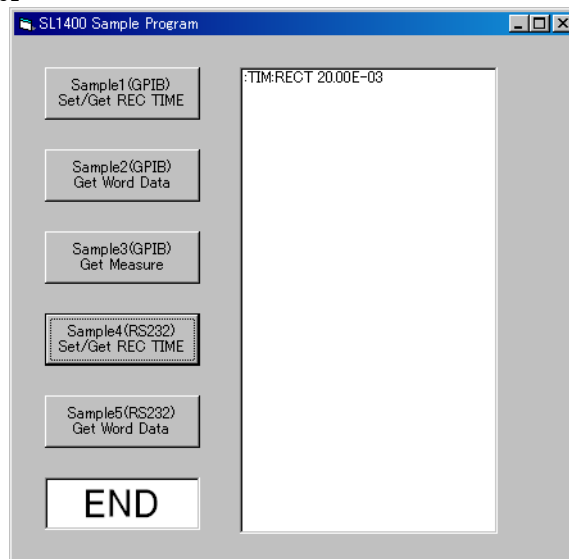
Query(0) = Left$(qry, Len(qry) - 1)
RS232Rectime = 0
finish:
MSComm1.PortOpen = False                 'Port Close
Timer1.Interval = 0

End Function
-----
GP-IB

```



RS-232



8.5 Data Output in Word Format (2 bytes)

```

Sample2(GPIB) Get Word Data
-----
Private Function GpibGetWord() As Integer
    Dim msg As String           'Command buffer
    Dim qry As String           'Query buffer
    Dim sts As Integer
    Dim vdv As Variant           'Vdiv value
    Dim ofs As Variant           'Offset value
    Dim eos As Integer           'EOS
    Dim hlg As Integer           'Block Header Length
    Dim dlq As Integer           'Block Data Length
    Dim dat As Variant           'Data
    Dim i As Integer

    msg = Space$(100)
    qry = Space$(100)

    sts = InitGpib               'Initialize GPIB
    If (sts <> 0) Then
        GpibGetWord = 1
        Exit Function
    End If

    msg = "STOP" + term          'Stop Acquisition
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    msg = "COMMUNICATE:HEADER OFF" + term 'Query Header Off(for Get V/div)
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    msg = "WAVEFORM:TRACE 1" + term 'Trace = 1
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    msg = "WAVEFORM:RECORD 0" + term 'Record number = 0
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    msg = "WAVEFORM:FORMAT WORD" + term 'Data Format = WORD
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    msg = "WAVEFORM:BYTEORDER LSBFIRST" + term 'Data Byte order = LSB First(for Little Endian)
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    msg = "WAVEFORM:START 0;END 1001" + term 'START 0,END 1001(Length = 1002)
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    msg = "WAVEFORM:RANGE?" + term 'Get V/div value
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    sts = ilrd(Dev, qry, Len(qry))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    vdv = Val(qry)
    msg = "WAVEFORM:OFFSET?" + term 'Get Offset value
    sts = ilwrt(Dev, msg, Len(msg))

```

```

    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    sts = ilrd(Dev, qry, Len(qry))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    ofs = Val(qry)

    eos = 0
    sts = ileos(Dev, eos) 'Terminator = None(for Binary Data)
    If (sts < 0) Then
        Call DisplayGPIBError(sts, "ileos")
        GpibGetWord = 1
        Exit Function
    End If
    msg = "WAVEFORM:SEND?" + term 'Receive Waveform Data
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    sts = ilrd(Dev, qry, 2) 'Receive "#X"
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    hlg = Val(Mid$(qry, 2, 1))
    sts = ilrd(Dev, qry, hlg) 'Receive Block Header
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    dlq = Val(Left$(qry, hlg)) 'dlq = Data Byte Length

    sts = ilrdi(Dev, WaveBuffer(), dlq + 1) 'Receive Waveform Data + LF
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If

    For i = 0 To (dlq / 2 - 1) Step 1
        dat = WaveBuffer(i) * vdv / 2400 + ofs
        List1.AddItem CStr(i) + ":" + CStr(dat)
    Next i

    eos = &HCOA
    sts = ileos(Dev, eos) 'Terminator = LF
    If (sts < 0) Then
        Call DisplayGPIBError(sts, "ileos")
        GpibGetWord = 1
        Exit Function
    End If
    msg = "COMMUNICATE:HEADER ON" + term 'Query Header On
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetWord = 1
        Exit Function
    End If
    Call ibonl(Dev, 0)
    GpibGetWord = 0
End Function
-----

Sample5(RS232) Get Word Data
-----
Private Function RS232GetWord() As Integer
    Dim msg As String 'Command buffer
    Dim qry As String 'Query buffer
    Dim sts As Integer
    Dim vdv As Variant 'V/div value
    Dim ofs As Variant 'Offset value
    Dim hlg As Integer 'Block Header Length
    Dim dlq As Integer 'Block Data Length
    Dim buf As Variant 'temporary buffer
    Dim dat As Variant 'data buffer
    Dim i As Integer

    msg = Space$(100)
    qry = CStr(Empty)

    sts = InitSerial 'Initialize RS232
    If (sts <> 0) Then

```


8.5 Data Output in Word Format (2 bytes)

```
Exit Function
End If

MSComm1.InputLen = 0
MSComm1.InputMode = comInputModeText
MSComm1.PortOpen = True
MSComm1.OutBufferCount = 0
MSComm1.InBufferCount = 0
Timer1.Interval = 1000

'Receive All Data
'Text Mode
'Port Open
'Out Buffer Clear
'In Buffer Clear

If CtsFlag = 1 Then
    TimerCount = 1
    Do
        Dummy = DoEvents()
        If (TimerCount >= Timeout) Then
            Call DisplayRS232Error("CTS Timeout")
            RS232GetWord = 1
            GoTo finish
        End If
    Loop Until MSComm1.CTSHolding = True
End If

msg = "STOP" + term
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

'Stop Acquisition

msg = "COMMUNICATE:HEADER OFF" + term
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

'Query Header Off(for Get V/div)

msg = "WAVEFORM:TRACE 1" + term
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

'Trace = 1

msg = "WAVEFORM:RECORD 0" + term
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

'Record number = 0

msg = "WAVEFORM:FORMAT WORD" + term
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

'Data Format = WORD

msg = "WAVEFORM:BYTEORDER LSBFIRST" + term
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

'Data Byte order = LSB First(for Little Endian)
```

```

End If
Loop Until MSComm1.OutBufferCount = 0

msg = "WAVEFORM:START 0;END 1001" + term          'START 0,END 1001(Length = 1002)
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

gry = CStr(Empty)
msg = "WAVEFORM:RANGE?" + term                    'Get V/div value
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0
TimerCount = 1
Do
    gry = gry + MSComm1.Input
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Receive Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until Right$(gry, 1) = term
vdv = Val(gry)

gry = CStr(Empty)
msg = "WAVEFORM:OFFSET?" + term                    'Get Offset value
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0
TimerCount = 1
Do
    gry = gry + MSComm1.Input
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Receive Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until Right$(gry, 1) = term
ofs = Val(gry)

msg = "WAVEFORM:SEND?" + term                      'Receive Waveform Data
MSComm1.Output = msg

TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

MSComm1.InputLen = 2                               'Receive "#X"
TimerCount = 1
Do Until MSComm1.InBufferCount >= 1
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Receive Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop
gry = MSComm1.Input
hlg = Val(Mid$(gry, 2, 1))

MSComm1.InputLen = hlg                             'Receive Block Header
TimerCount = 1
Do Until MSComm1.InBufferCount >= hlg

```

8.5 Data Output in Word Format (2 bytes)

```
Dummy = DoEvents()
If (TimerCount >= Timeout) Then
    Call DisplayRS232Error("Receive Timeout", msg)
    RS232GetWord = 1
    GoTo finish
End If
Loop
qry = MSComm1.Input
dlg = Val(Left$(qry, hlg))          'leng% = Data Byte Length

MSComm1.InputMode = comInputModeBinary
MSComm1.InputLen = 2                'Receive Waveform Data(2 Byte)

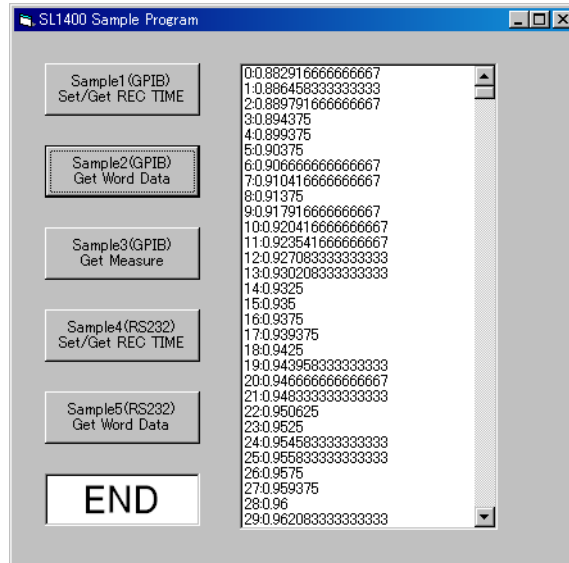
For i = 0 To (dlg / 2 - 1) Step 1    'Loop(dlg)
    TimerCount = 1
    Do Until MSComm1.InBufferCount >= 2
        Dummy = DoEvents()
        If (TimerCount >= Timeout) Then
            Call DisplayRS232Error("Receive Timeout", msg)
            RS232GetWord = 1
            GoTo finish
        End If
    Loop
    buf = MSComm1.Input
    dat = buf(1) * 256 + buf(0)      'Receive 1 Data(2 Byte)
    If (dat > 32767) Then
        dat = dat - 65536
    End If
    dat = dat * vdv / 2400 + ofs
    List1.AddItem CStr(i) + ":" + CStr(dat)
Next i

msg = "COMMUNICATE:HEADER ON" + term    'Query Header On
MSComm1.Output = msg
TimerCount = 1
Do
    Dummy = DoEvents()
    If (TimerCount >= Timeout) Then
        Call DisplayRS232Error("Send Timeout", msg)
        RS232GetWord = 1
        GoTo finish
    End If
Loop Until MSComm1.OutBufferCount = 0

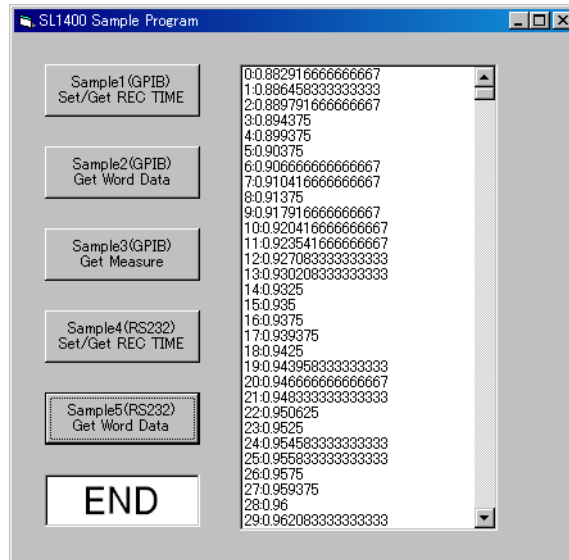
RS232GetWord = 0
finish:
MSComm1.PortOpen = False              'Port Close
Timer1.Interval = 0

End Function
-----
```

GP-IB



RS-232



8.6 Sets/Queries Measure Value

```

Sample3(GPIB) Get Measure value
-----
Private Function GpibGetMeasure() As Integer
    Dim msg As String           'Command buffer
    Dim qry As String           'Query buffer
    Dim sts As Integer
    Dim stp As Integer

    msg = Space$(100)
    qry = Space$(100)

    sts = InitGpib               'Initialize GPIB
    If (sts <> 0) Then
        GpibGetMeasure = 1
        Exit Function
    End If

    msg = "STOP" + term         'Acquisition = Stop
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "COMMUNICATE:HEADER OFF" + term   'Query Header Off(for Get V/div)
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "MEASURE:MODE OFF" + term          'Measure Off
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "CHANNEL:DISPLAY ON" + term        'CH1 On
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "CHANNEL:PROBE 10" + term          'CH1 Probe = 10:1
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "CHANNEL:VDIV 500mV" + term        'CH1 V/div = 500 mV
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "ACQUIRE:MODE NORMAL;" + term     'Acquisition mode = NORMAL, length = 1000
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "TIMEBASE:RECTIME 100ms" + term    'Rectime = 100 ms
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "TRIGGER:SIMPLE:LEVEL 500mV" + term 'Trigger level = 500 mV
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
    msg = "MEASURE:CHANNEL1:PTOPEAK:STATE ON" + term 'Measure P-P On
    sts = ilwrt(Dev, msg, Len(msg))
    If (sts < 0) Then
        Call DisplayGPIBError(sts, msg)
        GpibGetMeasure = 1
        Exit Function
    End If
End If

```

```

msg = "MEASURE:CHANNEL1:AVERAGE:STATE ON" + term           'Measure Average On
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
msg = "MEASURE:CHANNEL1:FREQUENCY:STATE ON" + term          'Measure Frequency On
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
msg = "MEASURE:TRANGE -5,5" + term                          'Measure Time Range -5,5
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If

msg = "SSTART? 500" + term                                   'Start Single Trigger
sts = ilwrt(Dev, msg, Len(msg))                             'Wait until stop Acquisition
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
sts = ilrd(Dev, qry, Len(qry))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
stp = Val(qry)
If (stp = 1) Then
    GpibGetMeasure = 2
    Exit Function
End If

msg = "MEASURE:MODE ON" + term                               'Start Measure
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
msg = "MEASURE:WAIT? 100" + term                             'Wait until stop Measure
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
sts = ilrd(Dev, qry, Len(qry))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If

msg = "MEASURE:CHANNEL1:PTOPEAK:VALUE?" + term 'Get P-P value
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
sts = ilrd(Dev, qry, Len(qry))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
Query(0) = "Peak To Peak:" + Left$(qry, ibcntl - 1)

msg = "MEASURE:CHANNEL1:AVERAGE:VALUE?" + term 'Get Average value
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
sts = ilrd(Dev, qry, Len(qry))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If

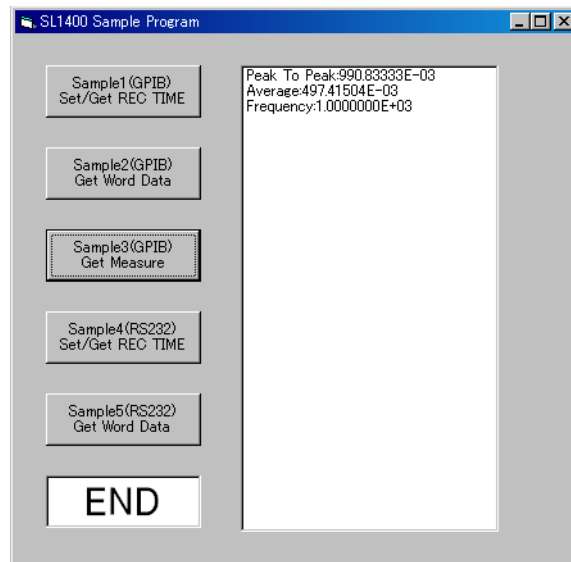
```

8.6 Sets/Queries Measure Value

```
Query(1) = "Average:" + Left$(qry, ibcntl - 1)

msg = "MEASURE:CHANNEL1:FREQUENCY:VALUE?" + term 'Get Freq value
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
sts = ilrd(Dev, qry, Len(qry))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
Query(2) = "Frequency:" + Left$(qry, ibcntl - 1)

msg = "COMMUNICATE:HEADER ON" + term 'Query Header On
sts = ilwrt(Dev, msg, Len(msg))
If (sts < 0) Then
    Call DisplayGPIBError(sts, msg)
    GpibGetMeasure = 1
    Exit Function
End If
Call ibonl(Dev, 0)
GpibGetMeasure = 0
End Function
```



Appendix

Appendix 1 ASCII Character Codes

ASCII character codes are given below.

	0	1	2	3	4	5	6	7
0	0 NUL	20 DEL	40 SP	60 0	80 @	100 P	120 '	140 p
1	1 SOH	21 DC1	41 !	61 1	81 A	101 Q	121 a	141 q
2	2 STX	22 DC2	42 "	62 2	82 B	102 R	122 b	142 r
3	3 ETX	23 DC3	43 #	63 3	83 C	103 S	123 c	143 s
4	4 EOT	24 DC4	44 \$	64 4	84 D	104 T	124 d	144 t
5	5 ENQ	25 NAK	45 %	65 5	85 E	105 U	125 e	145 u
6	6 ACK	26 SYN	46 &	66 6	86 F	106 V	126 f	146 v
7	7 BEL	27 ETB	47 ,	67 7	87 G	107 W	127 g	147 w
8	10 BS	30 CAN	50 (	70 8	90 H	110 X	130 h	150 x
9	11 HT	31 EM	51)	71 9	91 I	111 Y	131 i	151 y
A	12 LF	32 SUB	52 *	72 :	92 J	112 Z	132 j	152 z
B	13 VT	33 ESC	53 +	73 ;	93 K	113 [	133 k	153 {
C	14 FF	34 FS	54 ,	74 <	94 L	114 \	134 l	154
D	15 CR	35 GS	55 -	75 =	95 M	115]	135 m	155 }
E	16 SO	36 RS	56 .	76 >	96 N	116 ^	136 n	156 ~
F	17 SI	37 US	57 /	77 ?	97 O	117 _	137 o	157 DEL (RUBOUT)
	Address Command	Universal Command	Listener Address	Talker Address	Secondary Command			

Example



Appendix 2 Error Messages

Error messages related to communications are given below.

- The instrument allows error messages to be displayed in either Japanese or English, however, they are shown only in English when they are displayed on a personal computer.
- When servicing is required, contact your nearest YOKOGAWA representative.
- Only error messages relating to communications are given. For other error messages, refer to the *User's Manual IM 701240-01E*.

Errors in Communication Syntax (100 to 199)

Code	Message	Action	Reference Page
102	Syntax error.	Incorrect syntax.	Chapter 5, 6
103	Invalid separator.	Insert a comma between data items to separate them.	5-1
104	Data type error.	Refer to pages 5-5 to 5-6 and enter using the correct data format	5-5 to 5-6
105	GET not allowed.	GET is not supported as response to an interface message.	1-7
108	Parameter not allowed.	Check the number of parameters.	5-5, Chapter 6
109	Missing parameter.	Enter required parameters.	5-5, Chapter 6
111	Header separator error.	Insert a space between header and data to separate them.	5-1
112	Program mnemonic too long.	Check the mnemonic (a character string consisting of letters and numbers).	Chapter 6
113	Undefined header.	Check the header.	Chapter 6
114	Header suffix out of range.	Check the header.	Chapter 6
120	Numeric data error.	Numeric value must be entered for <NRf> format.	5-5
123	Exponent too large.	Use a smaller exponent for <NR3> format.	5-5, Chapter 6
124	Too many digits.	Limit the number of digits to 255 or less.	5-5, Chapter 6
128	Numeric data not allowed.	Enter in a format other than <NRf> format.	5-5, Chapter 6
131	Invalid suffix.	Check the unit for <Voltage>, <Time> and <Frequency>.	5-5
134	Suffix too long.	Check the units for <Voltage>, <Time> and <Frequency>.	5-5
138	Suffix not allowed.	No units are allowed other than <Voltage>, <Time> and <Frequency>.	5-5
141	Invalid character data.	Enter one of the character strings in {...}.	Chapter 6
144	Character data too long.	Check the character strings in {...}.	Chapter 6
148	Character data not allowed.	Enter in a format other than in {...}.	Chapter 6
150	String data error.	<Character string> must be enclosed by double quotation marks or single quotation marks.	5-6
151	Invalid string data.	<Character string> is too long or contains characters which cannot be used.	Chapter 6
158	String data not allowed.	Enter in a data format other than <Character string>.	Chapter 6
161	Invalid block data.	<Block data> is not allowed.	5-7, Chapter 6
168	Block data not allowed.	<Block data> is not allowed.	5-7, Chapter 6
171	Invalid expression.	Equation is not allowed.	Chapter 6
178	Expression data not allowed.	Equation is not allowed.	Chapter 6
181	Invalid outside macro definition.	Does not conform to the macro function specified in IEEE488.2.	—

Error in Communication Execution (200 to 299)

Code	Message	Action	Reference Page
221	Setting conflict.	Check the relevant setting.	Chapter 6
222	Data out of range.	Check the setting range.	Chapter 6
223	Too much data.	Check the data byte length.	Chapter 6
224	Illegal parameter value.	Check the setting range.	Chapter 6
241	Hardware missing.	Check availability of options.	—
260	Expression error.	Equation is not allowed.	—
270	Macro error.	Does not conform to the macro function specified in IEEE488.2.	—
272	Macro execution error.	Does not conform to the macro function specified in IEEE488.2.	—
273	Illegal macro label.	Does not conform to the macro function specified in IEEE488.2.	—
275	Macro definition too long.	Does not conform to the macro function specified in IEEE488.2.	—
276	Macro recursion error.	Does not conform to the macro function specified in IEEE488.2.	—
277	Macro redefinition not allowed.	Does not conform to the macro function specified in IEEE488.2.	—
278	Macro header not found.	Does not conform to the macro function specified in IEEE488.2.	—

Error in Communications Query (400 to 499)

Code	Message	Action	Reference Page
410	Query INTERRUPTED.	Check transmission/reception order.	5-2
420	Query UNTERMINATED.	Check transmission/reception order.	5-2
430	Query DEADLOCKED.	Limit the length of the program message including <PMT> to 1024 bytes or less.	5-2
440	Query UNTERMINATED after indefinite response.	Do not enter any query after *IDN? and *OPT?.	—

Error in System Operation (912)

Code	Message	Action	Reference Page
912	Fatal error in the communication driver.	Servicing is required.	—

Warning (50)

Code	Message	Action	Reference Page
50	*OPC/? exists in message.	Place the *OPC or *OPC? at the end of the program message.	—

Other Errors (350 and 390)

Code	Message	Action	Reference Page
350	Queue overflow.	Read the error queue. Code 350 occurs when the error queue is full up. This message is output only for the :STATUS:ERROR? query and is not displayed on the screen.	7-5
390	Overrun error. (only RS-232)	Execute with a lower baud rate.	—

Note

Code 350 indicates overflow of error queue. This code is returned as a response to the ":STATUS:ERROR?" query; it does not appear on the screen.

Appendix 3 Overview of IEEE 488.2-1992

The GP-IB interface provided with SL1400 conforms to IEEE 488.2-1992. This standard requires the following 23 points be stated in this document. This Appendix describes these points.

1 Subsets Supported by IEEE 488.1 Interface Functions

Refer to Section 1.4 "GP-IB Interface Specifications".

2 Operation of Device when the Device is Assigned to an Address Other than Addresses 0 to 30.

The SL1400 does not allow assignment to an address other than 0 to 30.

3 Reaction when the User Changes the Address

The current address is changed when a new address is set using MISC. The newly set address is valid until another new address is set.

4 Device Set-up at Power ON.Commands which can be Used at Power ON

Basically, the previous settings (i.e. the settings which were valid when power was turned OFF) are valid. All commands are available at power ON.

5 Message Transmission Options

a Input Buffer Size

4096 bytes

b Queries which Return Multiple Response Messages

Refer to Chapter 6, "Command List".

c Queries which Generate Response Data during Analysis of the Syntax

Every query generates a response data when analysis of the syntax is completed.

d Queries which Generate Response Data during Reception

No query generates response data when the query is received by the controller.

e Commands Consisting of Parameters which Restrict One Other

Some commands, like the :CHANnel<x>:VOLTage:PROBe and VDIV, have parameters which restrict unilaterally, but no commands have parameters which restrict bilaterally.

6 Options Included in Command Function Elements and Composite Header Elements

Refer to Chapters 5 and 6.

7 Buffer Size which Affects Transmission of Block Data

During transmission of block data, the output queue is extended according to the size of the data blocks.

8 List of Program Data Elements which can be Used in Equations, and Nesting Limit

No equations can be used.

9 Syntax of Response to Queries

Refer to the description of the commands given in Chapter 6.

10 Communications between Devices which do not Follow the Response Syntax

Not supported.

11 Size of Data Block of Response Data

1 to 2004000 bytes

12 List of Supported Common Commands

Refer to section 6.33, "Common Command Group".

13 Condition of Device when Calibration is Successfully Completed

Same as the one under which measurements are performed

14 Maximum Length of Block Data which can be Used for Definition of *DDT Trigger Macro

Not supported

15 Maximum Length of Macro Label Used in Definition of Macro, Maximum Length of Block Data which can be Used for Definition of Macro, Processing when Recursion is Used in Definition of Macro

Macro functions are not supported.

16 Response to *IDN?

Refer to section 6.33, "Common Command Group".

17 Size of Storage Area for Protected User Data for PUD and *PUD?

*PUD and *PUD? are not supported.

18 Length of *RDT and *RDT? Resource Name

*RDT and *RDT? are not supported.

19 Change in Status Due to *RST, *LRN?, *RCL and *SAV

***RST, *LRN?**

Refer to section 6.33, "Common Command Group".

***RCL, *SAV**

These commands are not supported.

20 Execution Range of Self-Test Using the *TST?

All the memory tests (for each internal memory) given in the Self Test menu displayed using MISC can be executed.

21 Structure of Extended Return Status

Refer to Chapter 7.

22 To Find out whether Each Command is Performed in Parallel or Sequentially

Refer to Section 5.5 "Synchronization with the Controller" and to Chapter 6.

23 Description of Execution of Each Command

Refer to Chapter 6 of this manual and to the *User's Manual IM701240-01E*.

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