User's Manual

AQ7270 Series OTDR Communication Interface

YOKOGAWA
Yokogawa Electric Corporation

IM 735020-17E
2nd Edition

Foreward

Thank you for purchasing YOKOGAWA's AQ7270 Series (AQ7270/AQ7275) OTDR. This Communication Interface User's Manual describes the functions and commands of USB and Ethernet (optional) interface. To ensure proper use of the USB/Ethernet (optional) 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 AQ7270/AQ7275 including thisCommunication Interface User's Manual.

Manual Name	Manual No.	Description
AQ7270 Series OTDR User's Manual (CD-ROM)	IM 735020-01E	Explains all functions except for the communications functions and operation procedures of the instrument.
AQ7270 Series TDR Communication Interface User's Manual (CD-ROM)	IM 735020-17E	Describes the communications functions of the USB/Ethernet interfaces. This manual.
AQ727 Series OTDR Operation Guide	IM 735020-02E	Describes safety precautions and the basic operations.

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.
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How to Use this Manual

Structure of the Manual

This User's Manual consists of the following sections:

Chapter 1 Remote Control Function Overview

Gives an overview of the various communication interfaces.

Chapter 2 USB Interface

Describes the functions and specifications of the USB interface used to control the AQ7270 series from a PC.

Chapter 3 Ethernet Interface (Option)

Describes the functions and specifications of the Ethernet interface.

Chapter 4 Before Programming

Describes the syntax used to transmit commands.

Chapter 5 Remote Commands

Describes each command that is available.

Appendix

Explains the support for AQ7260 commands.

Conventions Used in This Manual

Notations Used in the Procedural Explanations

On pages that describe the operating procedures in each chapter, the following notations are used to distinguish the procedure from their explanations.

Procedure This subsection contains the operating procedure used to carry out the function described in the current section. The procedures are written with inexperienced users in mind; experienced users may not need to carry out all the steps.

Explanation This subsection describes the setup parameters and the limitations on the procedures.

Note Calls attention to information that is important for proper operation of the instrument.

Terms Used in Explanations of Procedures

Panel Keys and Soft Keys

Bold characters used in the procedural explanations indicate characters that are marked on the panel keys or the characters of the soft keys displayed on the screen menu.

Units

Symbol	Description	Example
k	1000	400km
K	1024	459KB (file size)

Symbols Used in Syntax Descriptions

Symbols which are used in the syntax descriptions in Chapter 5 are shown below. These symbols are referred to as BNF notation (Backus-Naur Form).
For detailed information, see section 4.4, “Data.”

Symbol	Description	Example	Example of Input
<>	Defined value	SET:M<x> <x> = 1,2,3	-> SET:M2
{ }	One of the options in {} is selected.	LMTechnique {LSA|TPA}	-> LMTechnique TPA
|	Exclusive OR		

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1.1 Remote Interface

The AQ7270 series is equipped with the following remote interfaces.

USB 1.1 Interface (Type B. See Chapter 2)

This interface is used by a controller such as a PC to remotely control the AQ7270 series. A controller is connected to this interface.
Remote commands are used to control the AQ7270 series.
Dedicated commands for the AQ7270 series complying with SCPI (Standard Commands for Programmable Instruments) are available for the remote commands (see chapter 5).

Ethernet Interface (See Chapter 3)

This interface is used by a controller such as a PC to remotely control the AQ7270 series via the network.

Downloading the Library and Driver

The items below are needed on the PC to use the communication functions via the USB interface.

- AQ7270 series Series Library
- USB connection device driver between the PC and AQ7270 series

The items below are needed on the PC to use the communication functions via the Ethernet interface.

- AQ7270 series Series Library

The library and driver above can be downloaded from the following Web page.
http://www.yokogawa.com/tm/dl_driver.htm

1.2 Switching between Remote and Local Modes

When Switching from Local to Remote Mode

You can switch from local to remote mode by pressing the AQ7270 series keys.
For the procedure, see section 2.2, "Setting the USB" or 3.2, "Setting the Ethernet Interface."

- All keys except the "Local" key are disabled.
- Settings entered in local mode are passed on even when the AQ7270 series switches to remote mode.

When Switching from Remote to Local Mode

Pressing the "Local" key when the instrument is in the remote mode causes the instrument to switch to the local mode.
For the procedure, see section 2.2, "Setting the USB" or 3.2, "Setting the Ethernet Interface."

- Key operations are enabled.
- Settings entered in remote mode are passed on even when the AQ7270 series switches to local mode.

2.1 Connecting via the USB

You can control the AQ7270 series from a PC using the USB interface.

USB Interface Functions and Specifications

Reception 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 of the panel, and error codes.

Transmission Function

Outputs measured and computed data.
Outputs panel setup data and the status byte.
Outputs error codes that have occurred.

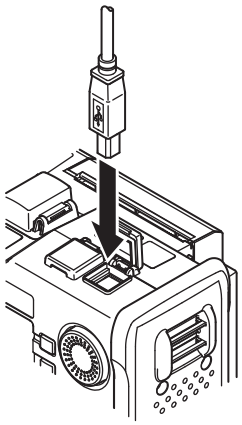
USB Interface Specifications

Electrical and mechanical specifications:	Conforms to USB Rev.1.0
Connector:	Type B connector (receptacle)
Number of ports:	1
Power supply:	Self-powered
Compatible PC systems:	PCs with standard USB ports running Windows 98 SE, Windows Me, Windows 2000, or Windows XP. (A separate device driver is required to connect to a PC.)

Connection Procedure

Connecting a USB Cable to Remotely Control the AQ7270 series or Accessing the Internal Memory

1. Open the top cover.
2. Connect a USB cable to the Type B connector.



Precautions to Be Taken When Connecting the Cable

- Connect the USB cable by inserting the connector firmly into the USB connector.
- Do not connect or disconnect the USB cable after the power is turned ON until the AQ7270 series is ready for operation (approximately 20 s).

2.2 Setting the USB

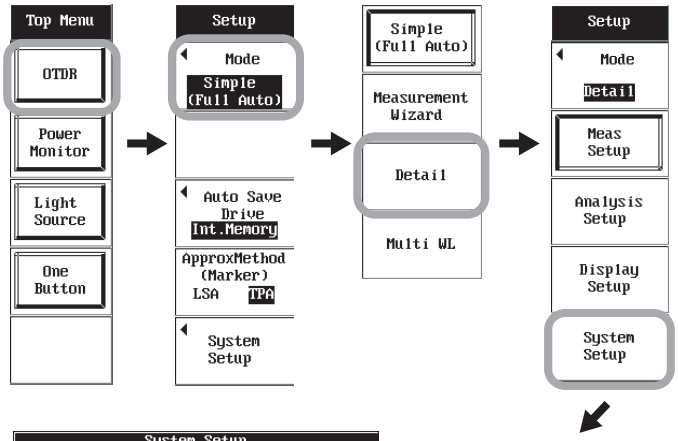
Procedure

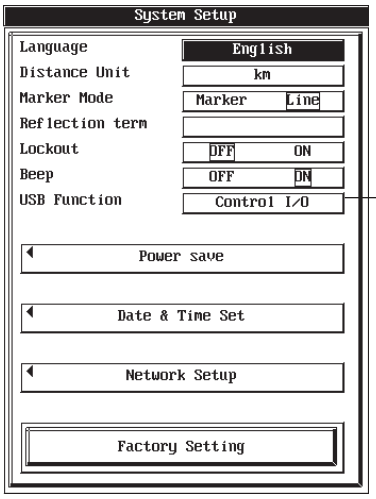
Selecting the Detail Mode

1. Press the **OTDR** soft key. The optical pulse measurement display appears.
2. Press **SETTING**. Soft keys for the settings appear.
3. Press the **Mode** soft key. A soft key menu for selecting the setup mode appears.
4. Press the **Detail** soft key. Soft keys for the Detail mode appear.

Displaying the System Setup Screen

5. Press the **System Setup** soft key. The system setup screen appears.
   Select Remote I/F.

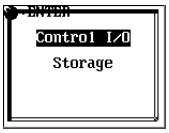




Select Control I/F.

Selecting the USB Function

6. Move the cursor to USB Function using the **arrow** keys or **rotary knob**.
7. Press **ENTER**. The screen for selecting the USB function appears.
8. Move the cursor to Control I/F using the **arrow** keys or **rotary knob**.
9. Press **ENTER**. The screen for selecting the USB function closes.

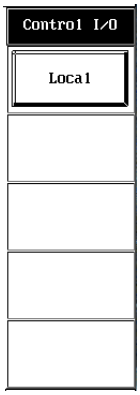


Note

- You cannot change the display while the AQ7270 series is being remotely controlled.
- Select Storage to read or write the measured results in the AQ7270 series internal memory from the PC.
- The AQ7270 series cannot be remotely controlled while the storage function is in operation. Remote control via the Ethernet interface is also not possible.

Releasing the Remote Control from the USB

Press the **Local** soft key.



3.1 Connecting via the Ethernet Interface (Option)

You can control the AQ7270 series from a PC by connecting the AQ7270 series to a LAN using the Ethernet interface.

Ethernet Interface Functions and Specifications

Reception 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 of the panel, and error codes.

Transmission Function

Outputs measured and computed data.
Outputs panel setup data and the status byte.
Outputs error codes that have occurred.

Ethernet Interface Specifications

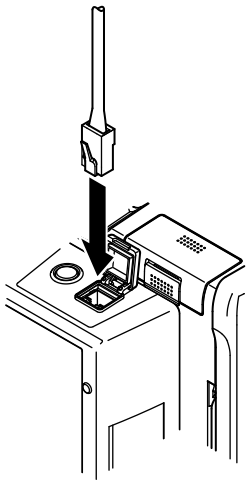
Number of communication ports:	1
Electrical and mechanical specifications:	Conforms to IEEE802.3
Transmission system:	Ethernet (10BASE-T/100BASE-TX)
Data rate:	10 Mbps/100 Mbps
Communication protocol:	TCP/IP
Connector type:	RJ45 connector
Port number used:	10001/tcp

Note

When using the Ethernet interface, a user name and password are required when connecting to the network. For the procedure to enter the user name and password, see section 3.2, "Setting the Ethernet Interface."

Connection Procedure

Connect a UTP (Unshielded Twisted-Pair) cable or an STP (Shielded Twisted-Pair) cable that is connected to a hub, for example, to the 100BASE-TX port on the rear panel of the AQ7270 series.



Precautions to Be Taken When Connecting the Cable

- Be sure to use a straight cable via a hub for the connection between the AQ7270 series and the PC.
- When using a UTP cable (straight cable), use a cable of category 5.

3.2 Setting the Ethernet Interface

Procedure

Note

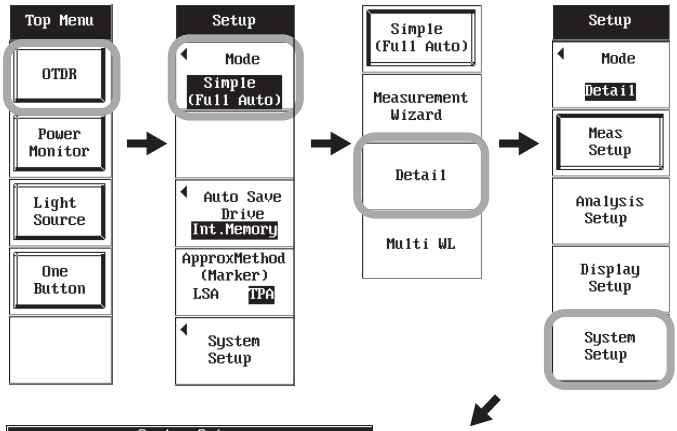
You must restart the AQ7270 series if you change the Ethernet settings.

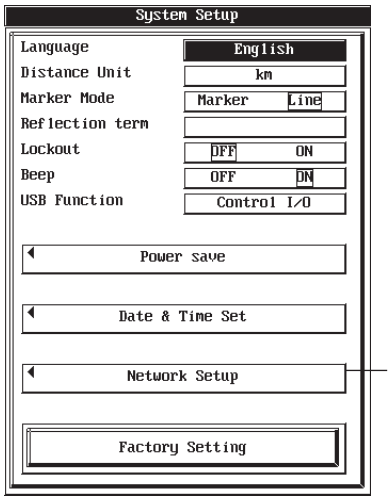
Selecting the Mode

1. Press the **OTDR** soft key. The optical pulse measurement display appears.
2. Press **SETTING**. Soft keys for the settings appear.
3. Press the **Mode** soft key. A soft key menu for selecting the setup mode appears.
4. Press the **Detail** soft key. Soft keys for the Detail mode appear.

Displaying the System Setup Screen

5. Press the **System Setup** soft key. The system setup screen appears.



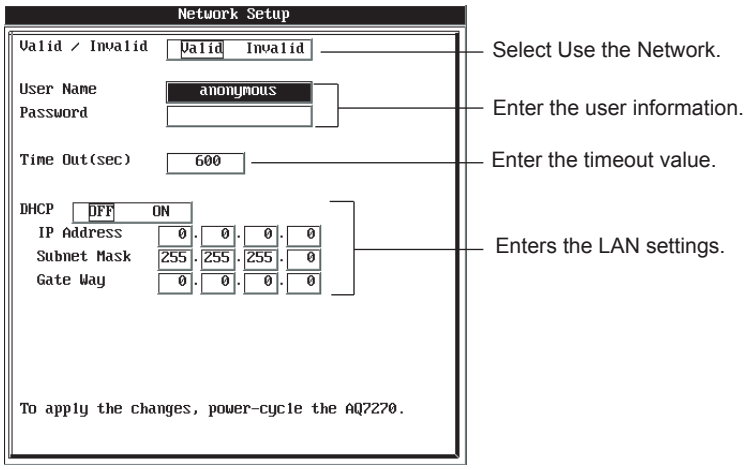


Enters the LAN settings.
(For details, see page 3-4)

Displaying the Network Setup Screen

6. Move the cursor to Network Setup using the **arrow keys** or **rotary knob**.

7. Press **ENTER**. The Network Setup screen appears.



- **Enabling the Network Setup**

8. Press **ENTER**. The cursor moves to Invalid. The item text color turns white.

- **Entering the User Name**

9. Move the cursor to User Name using the **arrow keys** or **rotary knob**.

10. Press **ENTER**. The screen for entering characters appears.

11. Enter the user name.

Note

For details on entering characters, see section 16.6 in the *AQ7270 series OTDR User's Manual*.

- **Entering the Password**

12. Move the cursor to Password using the **arrow keys** or **rotary knob**.

13. Press **ENTER**. The screen for entering characters appears.

14. Enter the password.

Note

For details on entering characters, see section 16.6 in the *AQ7270 series OTDR User's Manual*.

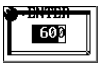
- **Setting the Timeout Value**

  15. Move the cursor to Time Out using the **arrow keys** or **rotary knob**.

  16. Press **ENTER**. The screen for setting the timeout value appears.

  17. Use the **rotary knob** to set the value.

  18. Press **ENTER**. The screen for setting the timeout value closes.



Note

The selectable range is 1 to 7200 or OFF.

- **Setting the Address (Auto)**

  19. Move the cursor to DHCP using the **arrow keys** or **rotary knob**.

  20. Press **ENTER** and move the cursor to ON.

Note

- You cannot set the address manually if the DHCP function is turned ON.
- A DHCP server is required on the network to use the DHCP function.

- **Setting the Address (Manual)**

  21. Move the cursor to IP address using the **arrow keys** or **rotary knob**.

  22. Press **ENTER**. The screen for setting the address appears.

  23. Use the **rotary knob** to set the value.

  24. Press **ENTER**. The screen for setting the address closes.

  25. Move the cursor to Subnet Mask using the **arrow keys** or **rotary knob**.

  26. Press **ENTER**. The screen for setting the address appears.

  27. Use the **rotary knob** to set the value.

  28. Press **ENTER**. The screen for setting the address closes.

  29. Move the cursor to Gate Way using the **arrow keys** or **rotary knob**.

  30. Press **ENTER**. The screen for setting the address appears.

  31. Use the **rotary knob** to set the value.

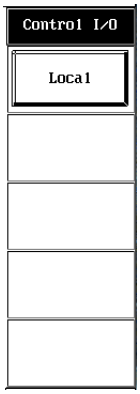
  32. Press **ENTER**. The screen for setting the address closes.

Note

You cannot change the display while the AQ7270 series is being remotely controlled.

Releasing the Remote Control from the Ethernet Interface

Press the **Local** soft key.



Explanation

The IP address of the AQ7270 series must be set correctly to use Ethernet interface function correctly.
If a DHCP server is available on the network to which the AQ7270 series is connected, the IP address is automatically assigned.
In this case, turn ON DHCP on the AQ7270 series.
For details on the network to which the AQ7270 series is connected, consult your network administrator.

Carry out the following settings when using a controller to set information that can be specified through key operation on the AQ7270 series or when outputting setup data or output waveform data to the controller.

Setting the User Name and Password

The Ethernet interface has a user verification function.
Set the user name and password for the AQ7270 series in advance.

- Setting the User Name
  Enter the name using up to 15 characters. The default setting is "anonymous."
- Setting the Password
  Enter the password using up to 15 characters.

Setting the Timeout Value

The connection to the network is automatically disconnected if there is no access to the AQ7270 series for the specified time.

Setting the TCP/IP Parameters

You must set the following TCP/IP parameters to use the Ethernet interface function.

- IP address
- Subnet mask
- Gateway

Note

- If the user verification fails, the connection to the AQ7270 series is disconnected.
- A password is not required if the user name is "anonymous."
- If you change the user name, password, timeout value, or TCP/IP settings, power-cycle the AQ7270 series to activate the new settings.

The AQ7270 series has an FTP function. You can transfer the data stored in the AQ7270 series internal memory to the PC using FTP commands from the PC.
However, you cannot transfer data from the PC to the AQ7270 series memory.

4.1 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

Program Message Unit

A program message consists of one or more programmessage 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 furtherbelow.

Example `:ACQuire:AVERage:MODE HIREFLECTION;TIME AUTO<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 Header>

A program header is used to indicate the command type. For details, refer to page 4-3.

<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 4-5.

Example `:ACQuire:AVERage:MODE HIREFLECTION<PMT>`

Header Data

Response Messages

<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 ";" (semicolon).

Example `:ACQuire:AVERage:MODE HIREFLECTION;TIME AUTO<PMT>`

<RMT>

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

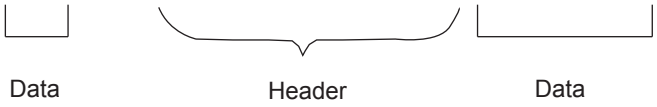
<Response Header>

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

<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 4-5.

Example `1200<RMT> :ACQuire:AVERage:MODE HIREFLECTION<PMT>`



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 eachquery, 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 receivedwill be discarded.
- If an attempt is made by the controller to receive a response message, even if there it 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.

4.2 Commands

There are two 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

Common Command Header Commands defined in IEEE 488.2-1987 are called common commands.
An asterisk (*) must always be attached to the beginning of a command.
An example of a common command

```
*CLS
```

Compound header

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 below. A colon (:) must be used when specifying a lower-level header.
An example of a compound header

```
: ACQuire: AVERage: MODE
```

When Concatenating Commands

Command Group

A command group is a group of commands which havethe same compound header. A command group maycontain sub-groups.

Example Commands relating to acquisition settings

```
:ACQuire:AVERage:MODE
:ACQuire:ATTenuation
:ACQuire:AVERage:TYPE
:ACQuire:DRANge
:ACQuire:PWIDth
:ACQuire:REALtime:STARt
:ACQuire:SETTing
```

When Concatenating Commands of the SameGroup

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

Example

```
:ACQuire:AVERage:MODE HIREFLECTION;TIME AUTO<PMT>
```

When Concatenating Commands of DifferentGroups

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:AVERage:MODE HIREFLECTION;:DISPlay:CURSor
:SECond ON<PMT>
```

When Concatenating Common Commands

Common commands defined in IEEE 488.2-1987 are independent of hierarchical level. Thus, it is not necessary to add a colon (:) before a commoncommand.

Example

```
:ACQuire:AVERage:MODE HIREFLECTION;*CLS;TIME AUTO<PMT>
```

When Separating Commands with <PMT>

If a terminator is used to separate two commands,each command is a separate message. Therefore, thecommon header must be typed in for each commandeven when commands of the same command groupare being concatenated.

Example

```
:ACQuire:AVERage:MODE HIREFLECTION<PMT>:ACQuire:AVERage
:TIME AUTO<PMT>
```

Upper-level Query

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

Example

```
:ANALysis:THReshold?<PMT>
->:ANAL:THR:EOF 3.0;FERL 40.0;FESL 1.00;RLOS 70.0
;SLOS 0.03
```

Note

- 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.
- Not all a group's information will necessarily be sent out as a response. Some upper-levelqueries will not return setup data which is not currently in use.

Header Interpretation Rules

This instrument interprets the header receivedaccording to the following rules.

- Mnemonics are not case sensitive.
  Example
  "DRANge" can also be written as"drange" or "Drange."

- The lowercase part of a header can be omitted.
  Example
  "DRANge" can also be written as"DRANG" or "DRAN."

- If the header ends with a question mark, the command is a query. It is not possible to omit the question mark.
  Example
  "DRANge?" cannot be abbreviated to anything shorter than "DRAN?."

- If the "x" at the end of a mnemonic is omitted, it is assumed to be "1."
  ExampleIf "M<x>" is written as "M,"this represents "M1."

Note

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

4.3 Response

Form

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 messagewithout any change, a command header is attachedto 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 messageunless changes are made to it (i.e. it is a query-onlycommand), no header is attached and only the datais returned. Some query-only commands can bereturned 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 responseconsisting of a header and data. The"COMMunicate:HEADer" command is used to do this.

Abbreviated Form

Normally, the lowercase part is removed from are sponse header before the response is returned to the controller. Naturally, the full form of the header canalso be used. For this, the
"COMMunicate:VERBose" command is used. The part enclosed by [ ] is also omitted in the abbreviatedform.

4.4 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: Average time `-> ACQuire:AVERage:TIME 60`)
<Distance><Time> <Wavelength><Loss>	Physical value (Example: Distance range `-> ACQuire:DRANge 500`)
<Register>	Register value expressed as either binary,octal, decimalor hexadecimal (Example: Extended event register value `-> STATus:EESE #HFE`)
<Character data>	Specified character string (mnemonic). Can be selected from { } (Example: Setup mode `-> ACQuire:SETTing{SIMPLE|DETAIL|WIZARD|MULTI}`)
<Boolean>	Indicates ON/OFF. Set to ON or OFF (Example: Fault event display `-> ANALysis:FEDetection ON`)
<Character string data>	Arbitrary character string (Example: Comment to be saved `-> FILE:SAVe: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 `-> #800000010ABCDEFGHIJ`)

<Decimal>

<Decimal> indicates a value expressed as a decimalnumber, as shown in the table below. Decimal valuesare 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 tothis 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. Thesame form is used, irrespective of whether the valueis 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.

<Distance>, <Time>, <Wavelength>, and <Loss>

<Distance>, <Time>, <Wavelength>, and <Loss> 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>	0.85UM
<NRf><Unit>	500m
<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
M	Meter	Distance
S	Second	Time
dB	Decibel	Level
UM	Micro meter	Wavelength

- <Multiplier> and <Unit> are not case sensitive.
- "U" is used to indicate "µ."
- "MA" is used for Mega (M) to distinguish it from Milli.
- If both <Multiplier> and <Unit> are omitted, thedefault unit will be 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<Hexadecimal value made up of the digits 0 to 9, and A to F>	#H0F
#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 4-4.

Form	Example
{SIMPLE|DETAIL|WIZARD|MULTI}	DETAIL

- 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 apostrophes (') or double quotation marks (").

Form	Example
<Character string data>	'ABC' "IEEE488.2-1987"

- 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 apostrophe (') 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.
- The first 12 characters of <Character Data> are assigned as the file name.
- The first 14 characters of <Character String Data> are assigned as the file name.
- 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 thecontroller.

4.5 Synchronization with the Controller

Achieving Synchronization

If you send the following program message when receiving averaging measurement data, the data may be retrieved before the completion of the measurement.

```
ACQuire: AVERage: STARt; : WAVedata: DISPlay: SEND: ASCii?
```

In such case, the following method must be used to synchronize with the end of the acquisition.

Using the STATus:CONDition? Query

The "`STATus:CONDition?`" command is used to query the contents of the condition register.

Whether averaging measurement waveforms are being retrieved can be determined by reading bit 1 of the condition register.

If bit 1 of the condition register is "`1`", waveforms are being retrieved. Otherwise, it is stopped.(Bit 1 is "`0`".)

Note

For details on the condition register, see section 5.4, "Condition Register."

5.1 A List of Commands

Command	Function	Page
Common Command Group		
*CLS	Clears the event register and error queue.	5-6
*ESE	Sets the standard event enable register or queries the current setting.	5-6
*ESR?	Queries the standard event register and clears the register.	5-6
*IDN?	Queries the instrument model.	5-6
*RST	Initializes the command group's settings.	5-6
*SRE	Sets the service request enable register or queries the current setting.	5-6
*STB?	Queries the status byte register.	5-7
*TST?	Executes self test and queries the result.	5-7
*OPT?	Retrieves the information of the mounted option.	5-7
ACQuire Group		
:ACQuire:ADSave	Sets the automatic data storage to the file or queries the current setting.	5-8
:ACQuire:AESearch	Sets the automatic event detection or queries the current setting.	5-8
:ACQuire:ATTenuation	Sets the attenuation or queries the current setting.	5-8
:ACQuire:AUTO:ATTenuation?	Queries the attenuation for AUTO.	5-8
:ACQuire:AUTO:DRANge?	Queries the distance range for AUTO.	5-8
:ACQuire:AUTO:PWIDth?	Queries the pulse width for AUTO.	5-8
:ACQuire:AVERage:CONTinue	Sets the averaging measurement continue or queries the current setting.	5-8
:ACQuire:AVERage:COUNt?	Queries the current average count.	5-8
:ACQuire:AVERage:INDex	Sets the average count or queries the current setting.	5-8
:ACQuire:AVERage:MODE	Sets the average mode or queries the current setting.	5-9
:ACQuire:AVERage:STARt	Executes the averaging measurement.	5-9
:ACQuire:AVERage:STOP	Stops the averaging measurement.	5-9
:ACQuire:AVERage:TIME	Sets the average time or queries the current setting.	5-9
:ACQuire:AVERage:TYPE	Sets the average unit or queries the current setting.	5-9
:ACQuire:DRANge	Sets the distance range or queries the current setting.	5-9
:ACQuire:OFFSet	Sets the horizontal measurement start position or queries the current setting.	5-9
:ACQuire:PLUGcheck	Sets the connection check of the optical plug or queries the current setting.	5-10
:ACQuire:PWIDth	Sets the pulse width or queries the current setting.	5-10
:ACQuire:REALtime:STARt	Executes the realtime measurement.	5-10
:ACQuire:REALtime:STOP	Stops the realtime measurement.	5-10
:ACQuire:SETTing	Sets the setup mode or queries the current setting.	5-10
:ACQuire:SMPinterval:DATA	Sets the sampling interval or queries the current setting.	5-10
:ACQuire:SMPinterval:VALue?	Queries the sampling interval.	5-10
:ACQuire:WAVelength	Sets the measured wavelength or queries the current setting.	5-10
ANALysis Group		
:ANALysis:ASEarch:EXECute	Executes the auto detection.	5-11
:ANALysis:ASEarch:NUMber?	Queries the number of auto detection events.	5-11
:ANALysis:BCOefficient	Sets the backscattering light level of the current wavelength or queries the current setting.	5-11
:ANALysis:IOR	Sets the group refraction index of the current wavelength or queries the current setting.	5-11
:ANALysis:CURSor:DELete	Clears the cursor.	5-11
:ANALysis:CURSor:DISTance	Sets the cursor position or queries the current setting.	5-11
:ANALysis:CURSor:DECibel?	Queries the cursor dB (decibel).	5-11
:ANALysis:EMARker:LMTechnique	Sets the approximation method (event) or queries the current setting.	5-11

Command	Function	Page
:ANALysis:EMARker:SET:M1	Sets marker M1 of the current event or queries the current setting.	5-11
:ANALysis:EMARker:SET:M2	Sets marker M2 of the current event or queries the current setting.	5-11
:ANALysis:EMARker:SET:M3	Sets marker M3 of the current event or queries the current setting.	5-12
:ANALysis:EMARker:SET:Y2	Sets marker Y2 of the current event or queries the current setting.	5-12
:ANALysis:DUNit	Sets the distance unit or queries the current setting.	5-12
:ANALysis:EVENt:IOR	Sets the section IOR of the current event or queries the current setting.	5-12
:ANALysis:EVENt:CURRent:CUMLoss?	Retrieves the accumulated loss of the current event.	5-12
:ANALysis:EVENt:CURRent:DISTance?	Retrieves the distance of the current event.	5-12
:ANALysis:EVENt:CURRent:INDex	Moves the current event.	5-12
:ANALysis:EVENt:CURRent:IOR?	Retrieves the section IOR of the current event.	5-12
:ANALysis:EVENt:CURRent:LOSS?	Retrieves the splice loss of the current event.	5-12
:ANALysis:EVENt:CURRent:NOTE	Sets the event note or queries the current setting.	5-12
:ANALysis:EVENt:CURRent:RETurnloss?	Retrieves the return loss of the current event.	5-13
:ANALysis:EVENt:CURRent:UNITloss?	Retrieves the loss per unit (dB/m) of the current event.	5-13
:ANALysis:EVENt:DELete	Deletes the current event.	5-13
:ANALysis:EVENt:INSert	Inserts the event at the cursor position.	5-13
:ANALysis:FEDetection	Sets the fault event display or queries the current setting.	5-13
:ANALysis:FMARker:DELete	Deletes the marker.	5-13
:ANALysis:FMARker:LMTechnique	Sets the approximation method of the marker or queries the current setting.	5-13
:ANALysis:FMARker:LOSS?	Queries the splice loss.	5-13
:ANALysis:FMARker:RETurnloss:VALue?	Queries the return loss.	5-13
:ANALysis:FMARker:RETurnloss:SATurated?	Queries the saturation of the return loss.	5-14
:ANALysis:FMARker:REFLection:VALue?	Queries the reflection level.	5-14
:ANALysis:FMARker:REFLection:SATurated?	Queries the saturation of the reflection level.	5-14
:ANALysis:FMARker:LEFT:LOSS?	Queries the loss between markers 1 and 2.	5-14
:ANALysis:FMARker:LEFT:DISTance?	Queries the distance between markers 1 and 2.	5-14
:ANALysis:FMARker:LEFT:UNITloss?	Queries the slope between markers 1 and 2.	5-14
:ANALysis:FMARker:RIGHt:LOSS?	Queries the loss between markers 2 and 3.	5-14
:ANALysis:FMARker:RIGHt:DISTance?	Queries the distance between markers 2 and 3.	5-14
:ANALysis:FMARker:RIGHt:UNITloss?	Queries the slope between markers 2 and 3.	5-14
:ANALysis:FMARker:SET:M<x>	Sets the marker or queries the current setting.	5-14
:ANALysis:FMARker:SET:Y<x>	Sets the auxiliary marker or queries the current setting.	5-14
:ANALysis:REFerence:DELete	Deletes the distance reference.	5-14
:ANALysis:REFerence:DISTance	Sets the distance reference.	5-14
:ANALysis:THReshold:EOFiber	Sets the threshold level of the end of fiber or queries the current setting.	5-14
:ANALysis:THReshold:FERLoss	Sets the threshold level of the return loss of the fault event or queries the current setting.	5-14
:ANALysis:THReshold:FESLoss	Sets the threshold level of the splice loss of the fault event or queries the current setting.	5-15
:ANALysis:THReshold:RLOSs	Sets the threshold level of the return loss or queries the current setting.	5-15
:ANALysis:THReshold:SLOSs	Sets the threshold level of the splice loss or queries the current setting.	5-15
:ANALysis:SECTion:STARt	Sets the start position of the section data or queries the current setting.	5-15
:ANALysis:SECTion:END	Sets the end position of the section data or queries the current setting.	5-15
:ANALysis:SECTion:LOSS?	Queries the loss in the section data.	5-15
:ANALysis:SECTion:RETurnloss:VALue?	Queries the return loss in the section data.	5-15
:ANALysis:SECTion:RETurnloss:SATurated?	Queries the saturation of the return loss in the section data.	5-15
:ANALysis:SECTion:DISTance?	Queries the distance of the section data.	5-15
:ANALysis:SECTion:REFerence	Sets the reference point of the section data.	5-15

Command	Function	Page
:ANALysis:SECTion:LMTechnique	Sets the approximation method of the section analysis or queries the current setting.	5-15
:ANALysis:SECTion:DELete	Clears the section analysis data.	5-15
:ANALysis:SECTion:BASelevel?	Queries the dB value of the reference point of the section data.	5-15
:ANALysis:TRACefix:STATe	Sets the tracefix or queries the current setting.	5-15
COMMunicate Group		
:COMMunicate?	Queries all settings related to communications.	5-16
:COMMunicate:HEADer	Sets whether to include a header to the response or queries the current setting.	5-16
:COMMunicate:VERBose	Sets whether to return the response in full or abbreviated form or queries the current setting.	5-16
DISPlay Group		
:DISPlay:ALINe	Sets the display of the approximation line or queries the current setting.	5-16
:DISPlay:COLor	Sets the screen color or queries the current setting.	5-16
:DISPlay:CURSor:DBValue	Sets the dB value of cursor or queries the current setting.	5-16
:DISPlay:CURSor:SECond	Sets the secondary cursor display or queries the current setting.	5-16
:DISPlay:CURSor:TYPE	Sets the cursor type or queries the current setting.	5-16
:DISPlay:DECibel:UPPer	Sets the display start level or queries the current setting.	5-17
:DISPlay:DIGit:DECibel	Sets dB display digit or queries the current setting.	5-17
:DISPlay:DIGit:DISTance	Sets the distance display unit or queries the current setting.	5-17
:DISPlay:DISTance:LEFT	Sets the display start distance or queries the current setting.	5-17
:DISPlay:DIVide:DECibel	Sets the vertical zoom rate or queries the current setting.	5-17
:DISPlay:DIVide:DISTance	Sets the horizontal zoom rate or queries the current setting.	5-18
:DISPlay:GTYPe	Sets grid display or queries the current setting.	5-18
:DISPlay:IMARk	Sets the marker information display or queries the current setting.	5-18
:DISPlay:ISCale	Initializes the display scale.	5-18
:DISPlay:OVERview	Sets overview display or queries the current setting.	5-18
:DISPlay:WAVE:TYPE	Sets the waveform type display format or queries the current setting.	5-18
FILE Group		
:FILE:DELete:EXECute	Deletes the file.	5-19
:FILE:DRIVe:FREE?	Queries the free space on the current drive.	5-19
:FILE:DRIVe:SET	Sets the current drive or queries the current setting.	5-19
:FILE:FILE:GET?	Retrieves the specified file.	5-19
:FILE:FILE:NAME	Specifies the file name.	5-19
:FILE:FILE:SIZE?	Retrieves the size of the specified file.	5-19
:FILE:FOLDer:MAKE	Creates a folder.	5-19
:FILE:FOLDer:PATH	Sets the current folder name or queries the current setting.	5-19
:FILE:FOLDer:LIST?	Retrieves the current folder list.	5-20
:FILE:SUBFolder:LIST?	Retrieves the sub folder list in the current folder.	5-20
:FILE:LOAD:EXECute	Loads the file.	5-20
:FILE:SAVE:COMMent	Sets the comment to be saved or queries the current setting.	5-20
:FILE:SAVE:EXECute	Saves the file.	5-20
:FILE:SAVE:ID	Sets the ID number to be saved or queries the current setting.	5-20
:FILE:SAVE:TYPE	Sets the file name type to be saved or queries the current setting.	5-20
:FILE:SAVE:SUB	Sets the sub number to be saved or queries the current setting.	5-20
:FILE:TYPE	Sets the file type to be saved or queries the current setting.	5-20

5.1 A List of Commands

Command	Function	Page
LABel Group		
:LABel:CABLe:CODE	Sets the cable code or queries the current setting.	5-21
:LABel:CABLe:ID	Sets the cable ID or queries the current setting.	5-21
:LABel:COMPany	Sets the company name or queries the current setting.	5-21
:LABel:DFLag:CURRent	Sets the current data flag or queries the current setting.	5-21
:LABel:FIBer:ID	Sets the fiber ID or queries the current setting.	5-21
:LABel:FIBer:TYPE	Sets the fiber type or queries the current setting.	5-21
:LABel:LABel	Sets the label or queries the current setting.	5-21
:LABel:LOCation:ORIGinating	Sets the start position label or queries the current setting.	5-21
:LABel:LOCation:TERMinating	Sets the stop position label or queries the current setting.	5-22
:LABel:OPERator	Sets the name or queries the current setting.	5-22
MENU Group		
:MENU:ERRor:CLEar	Deleting the error dialog display	5-22
:MENU:FUNCtion	Sets the function mode or queries the current setting.	5-22
:MENU:MARKer	Sets the marker mode or queries the current setting.	5-22
MISC Group		
:MISC:DATE:MODE	Sets the date display type to be saved or queries the current setting.	5-23
:MISC:DATE:YEAR	Sets the year or queries the current setting.	5-23
:MISC:DATE:MONTh	Sets the month or queries the current setting.	5-23
:MISC:DATE:DAY	Sets the day or queries the current setting.	5-23
:MISC:DATE:HOUR	Sets the hour or queries the current setting.	5-23
:MISC:DATE:MINute	Sets the minute or queries the current setting.	5-23
:MISC:DATE:SET	Applies the date and time change.	5-23
:MISC:LANGuage	Sets the language or queries the current setting.	5-23
:MISC:LOCKout	Sets local lockout or queries the current setting.	5-23
:MISC:ARARmsound	Sets the alarm sound or queries the current setting.	5-23
:MISC:PSAVe	Sets the power save mode when the AC adapter is connected or queries the current setting.	5-24
:MISC:POWersave:AC	Sets the power save using the AC adapter or queries the current setting	5-24
:MISC:POWersave:BATTery	Sets the power save using the battery pack or queries the current setting.	5-24
:MISC:BRIGhtness:AC	Sets the LCD Brightness using the AC adapter or queries the current setting.	5-24
:MISC:BRIGhtness:BATTery	Sets the LCD Brightness using the battery pack or queries the current setting.	5-24
:MISC:LCD:BRIGhtness	Sets the LCD brightness when the AC adapter is connected. or queries the current setting.	5-24
:MISC:RLOSsmode	Sets the reflection display or queries the current setting.	5-24
NETWORK Group		
:NETWork:CONTrol:PASSword	Sets the Password or queries the current setting.	5-25
:NETWork:CONTrol:TIMeout	Sets the Timeout Value or queries the current setting.	5-25
:NETWork:CONTrol:USERname	Sets the User Name or queries the current setting.	5-25
:NETWork:DHCP	Sets enabling or disabling the DHCP function or queries the current setting.	5-25
:NETWork:GATeway	Sets the gateway or queries the current setting.	5-25
:NETWork:IPADdress	Sets the IP address or queries the current setting.	5-25
:NETWork:NETMask	Sets the netmask or queries the current setting.	5-25
:NETWork:STATe	Sets enabling or disabling the Network or queries the current setting.	5-26
PRINt Group		
:PRINt:COLor	Sets the print color or queries the current setting.	5-26
:PRINt:DEVice	Sets the printer port or queries the current setting.	5-26
:PRINt:MAKer	Sets the printer manufacturer or queries the current setting.	5-26
:PRINt:EVENtlist	Sets printing the event list or queries the current setting.	5-26

Command	Function	Page
SETup Group		
:SETup:INITialize	Initializes all the settings (factory default condition).	5-27
STATus Group		
:STATus?	Queries all settings related to the communication status.	5-27
:STATus:CONDition?	Queries the contents of the condition register.	5-27
:STATus:ERRor?	Queries the code and message of the error that occurred.	5-27
:STATus:QENable	Sets whether to store in the error queue or queries the current setting.(messages other than errors)	5-27
:STATus:QMESsage	Sets whether to attach the message to the response or queries the current setting.(response to STATus:ERRor?)	5-27
WAVedata Group		
:WAVedata:LENGth?	Queries the number of waveform data values.	5-28
:WAVedata:DISPlay:SEND:ASCii?	Queries the display waveform data in ASCII format.	5-28
:WAVedata:DISPlay:SEND:BINary?	Queries the display waveform data in binary format.	5-28
:WAVedata:OLDType:DISPlay:SEND?	Queries the display waveform data in Dot 4 format.	5-28
:WAVedata:OLDType:SEND?	Queries the waveform data in Dot 4 format.	5-28
:WAVedata:SEND:ASCii?	Queries the waveform data in ASCII format.	5-28
:WAVedata:SEND:BINary?	Queries the waveform data in binary format.	5-28
:WAVedata:SEND:STARt	Sets the start distance of the wavedata or queries the current setting.	5-28
:WAVedata:SEND:SIZE	Sets the number of waveform data to acquire or queries the current setting.	5-28
SYSTem Group		
:SYSTem:REBoot	Execution of restarting	5-29
:SYSTem:SHUTdown	Execution of shutdown	5-29
LIGHtsource Group		
:LIGHtsource:ABORt	Turns OFF the light source.	5-29
:LIGHtsource:EXECute	Turns ON the light source.	5-29
:LIGHtsource:MODulation	Sets the modulation frequency of the light source or queries the current setting.	5-29
:LIGHtsource:WAVelength	Sets the wavelength of the light source or queries the current setting.	5-29
PMONitor Group		
:PMONitor:WAVelength	Sets the wavelength of the power monitor or queries the current setting.	5-30
:PMONitor:ZERoset	Resets the power monitor to zero.	5-30
:PMONitor:DREF	Sets the reference value of the relative measurement of the power monitor.	5-30
:PMONitor:REFerence	Sets the power monitor reference or queries the current setting.	5-30
:PMONitor:OFFSet	Sets the power monitor offset or queries the current setting.	5-30
:PMONitor:THReshold	Sets the threshold level of the power monitor or queries the current setting.	5-30
:PMONitor:UNIT	Sets the display unit of the power monitor or queries the current setting.	5-30
:PMONitor:MEASurement:DATA?	Queries the measured result of the power monitor.	5-30

5.2 Common Commands

*CLS(Clear Status)

Function Clears all event status registers, the summary of which is reflected in the status byte register.

Syntax `*CLS`

Example `*CLS`

Description
- Clears all queues, with the exception of the output queue, and all event registers, with the exception of the MAV summary message.
- After executing this command, OCIS (Operation Complete Command Idle State) and OQIS (Operation Complete Query Idle State) are brought about.

*ESE(Standard Event Status Enable)

Function Sets/queries the standard event enable register.

Syntax `*ESE<wsp><integer>`
`*ESE?`
<integer> = 0 to 255

Example `*ESE 251`
`*ESE? -> 251`

Description
- An item having had its bit set becomes enabled.
- Resets to the default value in the following cases:
  When power is ON
  When “0” is set
- The set value remains the same in the following cases:
  `*RST`
  `*CLS`
  Device clear (DCL, SDC)
- The default is 0.

*ESR?(Standard Event Status Register)

Function Queries the standard event status register and simultaneously clears it.

Syntax `*ESR?`

Example `*ESR? -> 251`

Description The return value of this query is not affected by ESE (Event Status Enable Register).

*IDN? (Identification)

Function Queries the instrument type and firmware version.

Syntax `*IDN?`

Example `*IDN? -> YOKOGAWA,735026,`
`SN123456789,F1.00`
`SN123456789:Serial number`
`(9 digit string)`
`F1.00:` Firmware version

Description Outputs 4 field data delimited by a comma.
Field 1: Manufacturer “YOKOGAWA”
Field 2: Model “735026”
Field 3: Instrument serial number
"SN123456789"
Field 4: Software version "F1.00"

*RST (Reset)

Function Executes a device reset to return the instrument to the known (default) status.

Syntax `*RST`

Example `*RST`

Description
- Stops operation being processed and returns the instrument to the known set value (default value) immediately.
- This unit’s parameters are cleared.
- The following items will remain the same.
  Output queue
  SRE
  ESE
  Calibration data affecting the instrument’s specifications

*SRE(Service Request Enable)

Function Sets/queries the service request enable register.

Syntax `*SRE <wsp><integer>`
`*SRE?`
<integer> = 0 to 255

Example `*SRE 250`
`*SRE? -> 250`

Description
- An item having had its bit set becomes enabled.
- Resets to the default value in the following cases:
  When power is ON
  When “0” is set
- The set value remains the same in the following cases:
  `*RST`
  `*CLS`
  Device clear (DCL, SDC)
- The default is 0.

*STB?(Read Status Byte)

Function Queries the current value of the status byte register.

Syntax `*STB?`

Example `*STB? -> 251`

Description STB will not be cleared even when the contents of the register are read.

*TST?(Self Test)

Function Performs the instrument's self-test and queries the status.

Syntax `*TST?`

Example `*TST? -> 0`

Description Executes the operations below among the initialization sequence at startup and outputs the results. The screen retains the waveform screen while the initialization is in progress.
Internal battery check
Internal memory read check
"0" is returned if both checks are successful, "1" if they are not.

*OPT?

Function Retrieves the information of the mounted option.

Syntax `*OPT?`

Example `*OPT? -> PM,LS,PL`

Description Outputs the data delimited by a comma.

Optical power monitor function:	PM
Light source function:	LS
Internal printer and LAN: (Ethernet interface)	PL
Dummy fiber (SMF):	DF
Shoulder belt:	SB

5.3 Device-Specific Commands

ACQuire Group

The commands in this group deal with the waveform acquisition. You can make the same settings and inquiries as when the front panel is used. Change the measurement conditions through remote control while the measurement is stopped. You cannot change the measurement conditions while realtime or averaging measurement is in progress. Only :REALtime:STOP or AVERage:STOP is valid while the measurement is in progress.

:ACQuire:ADSave

Function Sets the automatic data storage to the file after the execution of the averaging measurement or queries the current setting.

```
Syntax      :ACQuire:ADSave {<Boolean>}
            :ACQuire:ADSave?
Example     :ACQuire:ADSave ON
            :ACQuire:ADSave? -> :ACQ:ADS 1
```

:ACQuire:AESearch

Function Sets the automatic event detection after the execution of the averaging measurement or queries the current setting.

```
Syntax      :ACQuire:AESearch {<Boolean>}
            :ACQuire:AESearch?
Example     :ACQuire:AESearch OFF
            :ACQuire:AESearch? -> :ACQ:AES 0
```

:ACQuire:ATTenuation

Function Sets the attenuation or queries the current setting.

```
Syntax      :ACQuire:ATTenuation {<NRf>|AUTO}
            :ACQuire:ATTenuation?
            <NRf> = 0.00 to 27.50 (steps of 2.5)
Example     :ACQuire:ATTenuation 2.5
            :ACQuire:ATTenuation AUTO
            :ACQuire:ATTenuation?
            -> :ACQ:ATT 25.00
```

Description The selectable range varies depending on the wavelength, distance range, and pulse width.
You cannot set the attenuation if the average mode is high reflection.
You cannot set the pulse width if the distance range is set to auto.

:ACQuire:AUTO:ATTenuation?

Function Queries the attenuation for AUTO.

```
Syntax      :ACQuire:AUTO:ATTenuation?
Example     :ACQuire:AUTO:ATTenuation?
            -> :ACQ:AUT:ATT 0.00
```

Description The unit is set to m. (meter)

:ACQuire:AUTO:DRANge?

Function Queries the distance range for AUTO.

```
Syntax      :ACQuire:AUTO:DRANge?
Example     :ACQuire:AUTO:DRANge?
            -> :ACQ:AUT:DRAN 20000
```

Description The unit is set to s. (second)

:ACQuire:AUTO:PWIDth?

Function Queries the pulse width for AUTO.

```
Syntax      :ACQuire:AUTO:PWIDth?
Example     :ACQuire:AUTO:PWIDth?
            -> :ACQ:AUT:PWID 100E-09
```

:ACQuire:AVERage:CONTinue

Function Sets the averaging measurement continue or queries the current setting.

```
Syntax      :ACQuire:AVERage
            :CONTinue {<Boolean>}
            :ACQuire:AVERage:CONTinue?
Example     :ACQuire:AVERage:CONTinue ON
            :ACQuire:AVERage:CONTinue?
            -> :ACQ:AVER:CONT 1
```

:ACQuire:AVERage:COUNt?

Function Queries the current average count.

```
Syntax      :ACQuire:AVERage:COUNt?
Example     :ACQuire:AVERage:COUNt?
            -> :ACQ:AVER:COUN 0
```

:ACQuire:AVERage:INDex

Function Sets the average count or queries the current setting.

```
Syntax      :ACQuire:AVERage
            :INDex {AUTO|E2_10|E2_11.....E2_20}
            :ACQuire:AVERage:INDex?
Example     :ACQuire:AVERage:INDex AUTO
            :ACQuire:AVERage:INDex E2_12
            :ACQuire:AVERage:INDex?
            -> :ACQ:AVER:IND E2_15
```

Description Setting the averaging count

Auto:	AUTO
2E+10:	E2_10
2E+11:	E2_11
• • • • • •	
2E+20:	E2_20

:ACQuire:AVERage:MODE

Function Sets the average mode or queries the current setting.

Syntax
```
:ACQuire:AVERage
:MODE {HIREFLECTION|HISPEED}
:ACQuire:AVERage:MODE?
```

Example
```
:ACQuire:AVERage:MODE HIREFLECTION
:ACQuire:AVERage:MODE?
-> :ACQ:AVER:MODE HISPEED
```

Description
High Reflection : HIREFLECTION
High Speed : HISPEED

:ACQuire:AVERage:STARt

Function Executes the averaging measurement.

Syntax
```
:ACQuire:AVERage:STARt
```

Example
```
:ACQuire:AVERage:STARt
```

Description This command is valid while the averaging measurement is only in progress.

:ACQuire:AVERage:STOP

Function Stops the averaging measurement.

Syntax
```
:ACQuire:AVERage:STOP
```

Example
```
:ACQuire:AVERage:STOP
```

:ACQuire:AVERage:TIME

Function Sets the average time or queries the current setting.

Syntax
```
:ACQuire:AVERage:TIME {<NRf>|AUTO}
:ACQuire:AVERage:TIME?
```
<NRf> = 2 to 1800

Example
```
:ACQuire:AVERage:TIME AUTO
:ACQuire:AVERage:TIME 1200
:ACQuire:AVERage:TIME?
-> :ACQ:AVER:TIME 60
```

Description The following value can be set.

Auto:	AUTO
2 sec:	2
5 sec:	5
10 sec:	10
20 sec:	20
30 sec:	30
1 min:	60
3 min:	180
5 min:	300
10 min:	600
20 min:	1200
30 min:	1800

:ACQuire:AVERage:TYPE

Function Sets the average unit or queries the current setting.

Syntax
```
:ACQuire:AVERage
:TYPE {TIMES|DURATION}
:ACQuire:AVERage:TYPE?
```

Example
```
:ACQuire:AVERage:TYPE TIMES
:ACQuire:AVERage:TYPE DURATION
:ACQuire:AVERage:TYPE?
-> :ACQ:AVER:TYPE DURATION
```

Description
Times: TIMES
Duration: DURATION

:ACQuire:DRANge

Function Sets the distance range or queries the current setting.

Syntax
```
:ACQuire:DRANge {<NRf>|AUTO}
:ACQuire:DRANge?
```
<NRf> = 500m to 400000m (0.5km to 400km)

Example
```
:ACQuire:DRANge AUTO
:ACQuire:DRANge 500
:ACQuire:DRANge 500m
:ACQuire:DRANge 5000
:ACQuire:DRANge 100km
:ACQuire:DRANge? -> :ACQ:DRAN 1000
```

Description The value that you can specify varies depending on the wavelength setting.
The selectable distance range varies depending on the wavelength
Setting the distance range

Auto:	AUTO
500 m:	500
1 km:	1000
2 km:	2000
5 km:	5000
10 km:	10000
20 km:	20000
50 km:	50000
100 km:	100000
200 km:	200000
300 km:	300000
400 km:	400000

:ACQuire:OFFSet

Function Sets the horizontal measurement start position or queries the current setting.

Syntax
```
:ACQuire:OFFSet {<NRf>}
:ACQuire:OFFSet?
```

Example
```
:ACQuire:OFFSet 1000
:ACQuire:OFFSet?
-> :ACQ:OFFS 999.99265E+00
```

Description The unit is set to m. (meter)

:ACQuire:PLUGcheck

Function Sets the connection check of the optical plug or queries the current setting.

Syntax
```
:ACQuire:PLUGcheck {<Boolean>}
:ACQuire:PLUGcheck?
```

Example
```
:ACQuire:PLUGcheck ON
:ACQuire:PLUGcheck? -> :ACQ:PLUG 0
```

:ACQuire:PWIDth

Function Sets the pulse width or queries the current setting.

Syntax
```
:ACQuire:PWIDth {<NRf>|AUTO}
:ACQuire:PWIDth?
```
<NRf> = 3ns to 20us (3E-9 to 20E-6)

Example
```
:ACQuire:PWIDth AUTO
:ACQuire:PWIDth 3
:ACQuire:PWIDth 3E-9
:ACQuire:PWIDth 3ns
:ACQuire:PWIDth 10us
:ACQuire:PWIDth 10E-6
:ACQuire:PWIDth?
-> :ACQ:PWID 20.0E-06
```

Description The value that you can specify varies depending on the wavelength and distance range.
You cannot set the pulse width if the distance range is set to auto.
The value that you can specify varies depending on the wavelength and distance range.
You cannot set the pulse width if the distance range is set to auto.

Auto:	AUTO
3 ns:	3E-09
10 ns:	10E-09
20 ns:	20E-09
50 ns:	50E-09
100 ns:	100E-09
200 ns:	00E-09
500 ns:	500E-09
1 us:	1E-06
2 us:	2E-06
5 us:	5E-06
10 us:	10E-06
20 us:	20E-06

:ACQuire:REALtime:STARt

Function Executes the realtime measurement.

Syntax
```
:ACQuire:REALtime:STARt
```

Example
```
:ACQuire:REALtime:STARt
```

Description This command is valid while the measurement is stopped.

:ACQuire:REALtime:STOP

Function Stops the realtime measurement.

Syntax
```
:ACQuire:REALtime:STOP
```

Example
```
:ACQuire:REALtime:STOP
```

Description This command is valid while the realtime measurement is only in progress.

:ACQuire:SETTing

Function Sets the setup mode or queries the current setting.

Syntax
```
:ACQuire:SETTing {SIMPLE|DETAIL
|WIZARD|MULTI}
:ACQuire:SETTing?
```

Example
```
:ACQuire:SETTing DETAIL
:ACQuire:SETTing?
-> :ACQ:SETT SIMPLE
```

Description

Simple mode:	SIMPLE
Detail mode:	DETAIL
Detail wizard mode:	WIZARD
Multi-wavelength mode:	MULTI

:ACQuire:SMPinterval:DATA

Function Sets the sampling interval or queries the current setting.

Syntax
```
:ACQuire:SMPinterval
:DATA {<NRf>|NORMAL|HI}
:ACQuire:SMPinterval:DATA?
```

Example
```
:ACQuire:SMPinterval:DATA 2.0
:ACQuire:SMPinterval:DATA NORMAL
:ACQuire:SMPinterval:DATA?
-> :ACQ:SMP:DATA HI
```

Description You only set NORMAL or HI if the distance range is set to auto.
You only set NORMAL or HI if the distance range is set to auto.

Normal:	NORMAL
High resolution:	HI
5 cm:	0.05
10 cm:	0.10
20 cm:	0.20
50 cm:	0.50
1 m:	1.00
2 m:	2.00
4 m:	4.00
8 m:	8.00
16 m:	16.00
32 m:	32.00

:ACQuire:SMPinterval:VALue?

Function Queries the sampling interval.

Syntax
```
:ACQuire:SMPinterval:VALue?
```

Example
```
:ACQuire:SMPinterval:VALue?
-> :ACQ:SMP:VAL 8.0
```

:ACQuire:WAVelength

Function Sets the measured wavelength or queries the current setting.

Syntax
```
:ACQuire:WAVelength {<NRf>}
:ACQuire:WAVelength?
```
<NRf> = 0.850um to 1.650um
(850E-9 to 1650E-9)

Example
```
:ACQuire:WAVelength 0.85um
:ACQuire:WAVelength 1650E-9
:ACQuire:WAVelength 1.650E-6
:ACQuire:WAVelength?
-> :ACQ:WAV 1550E-09
```

Description The wavelength that you can specify varies depending on the model.

ANALysis Group

The commands in this group deal with waveform analysis. You can make the same settings and inquiries as when the front panel is used.

:ANALysis:ASEarch:EXECute

Function Executes auto detection.
Syntax :ANALysis:ASEarch:EXECute
Example :ANALysis:ASEarch:EXECute

:ANALysis:ASEarch:NUMber?

Function Queries the number of auto detection events.
Syntax :ANALysis:ASEarch:NUMber?
Example :ANALysis:ASEarch:NUMber?
-> :ANAL:ASE:NUM 2

:ANALysis:BCOefficient

Function Sets the backscattering light level of the current wavelength or queries the current setting.
Syntax :ANALysis:BCOefficient {<NRf>}
:ANALysis:BCOefficient?
<NRf> = -10.00 to -64.99 (steps of 0.01)
Example :ANALysis:BCOefficient -25.00
:ANALysis:BCOefficient?
-> :ANAL:BCO -50.00

:ANALysis:IOR

Function Sets the group refraction index of the current wavelength or queries the current setting.
Syntax :ANALysis:IOR {<NRf>}
:ANALysis:IOR?
<NRf> = 1.30000 to 1.79999
(steps of 0.00001)
Example :ANALysis:IOR 1.48000
:ANALysis:IOR?
-> :ANAL:GIND 1.48000

:ANALysis:CURSor:DELete

Function Clears the cursor.
Syntax :ANALysis:CURSor:DELete
Example :ANALysis:CURSor:DELete

:ANALysis:CURSor:DISTance

Function Sets the cursor position or queries the current setting.
Syntax :ANALysis:CURSor:DISTance {<NRf>}
:ANALysis:CURSor:DISTance?
<NRf> = Depend on distance range, distance reference and IOR.
Example :ANALysis:CURSor:DISTance 10.00
:ANALysis:CURSor:DISTance?
-> :ANAL:CURS:DIST 11.529900E+00
Description Depending on the distance range, distance reference and group refraction.

:ANALysis:CURSor:DECibel?

Function Queries the cursor dB (decibel).
Syntax :ANALysis:CURSor:DECibel?
Example :ANALysis:CURSor:DECibel?
-> :ANAL:CURS:DEC 32.878

:ANALysis:EMARker:LMTechnique

Function Sets the approximation method (event) or queries the current setting.
Syntax :ANALysis:EMARker
:LMTechnique {LSA|TPA}
:ANALysis:EMARker:LMTechnique?
Example :ANALysis:EMARker:LMTechnique LSA
:ANALysis:EMARker:LMTechnique?
-> :ANAL:EMAR:LMT TPA

:ANALysis:EMARker:SET:M1

Function Sets marker M1 of the current event or queries the current setting.
Syntax :ANALysis:EMARker:SET:M1
:ANALysis:EMARker:SET:M1?
Example :ANALysis:EMARker:SET:M1
:ANALysis:EMARker:SET:M1?
-> :ANAL:EMAR:SET:M1 5.0471900E+03
Description The marker is set to the cursor position when you set the marker.

:ANALysis:EMARker:SET:M2

Function Sets marker M2 of the current event or queries the current setting.
Syntax :ANALysis:EMARker:SET:M2
:ANALysis:EMARker:SET:M2?
Example :ANALysis:EMARker:SET:M2
:ANALysis:EMARker:SET:M2?
-> :ANAL:EMAR:SET:M2 7.2463500E+03
Description The marker is set to the cursor position when you set the marker.

:ANALysis:EMARker:SET:M3

Function Sets marker M3 of the current event or queries the current setting.

Syntax
```
:ANALysis:EMARker:SET:M3
:ANALysis:EMARker:SET:M3?
```

Example
```
:ANALysis:EMARker:SET:M3
:ANALysis:EMARker:SET:M3?
-> :ANAL:EMAR:SET:M3 9.0471600E+03
```

Description The marker is set to the cursor position when you set the marker.

:ANALysis:EMARker:SET:Y2

Function Sets marker Y2 of the current event or queries the current setting.

Syntax
```
:ANALysis:EMARker:SET:Y2
:ANALysis:EMARker:SET:Y2?
```

Example
```
:ANALysis:EMARker:SET:Y2
:ANALysis:EMARker:SET:Y2?
-> :ANAL:EMAR:SET:Y2 7.3777700E+03
```

Description The marker is set to the cursor position when you set the marker.

:ANALysis:DUNit

Function Sets the distance unit or queries the current setting.

Syntax
```
:ANALysis:DUNit {KM|MILE|KF}
:ANALysis:DUNit?
```

Example
```
:ANALysis:DUNit KM
:ANALysis:DUNit? -> :ANAL:DUN MILE
```

Description Setting the Distance Unit
km: KM
mile: MILE
kf: KF

:ANALysis:EVENt:CURRent:INDex

Function Changes the current event.

Syntax
```
:ANALysis:EVENt:CURRent
:INDex {<NRf>}
<NRf> = Event number
```

Example
```
:ANALysis:EVENt:CURRent:INDex 5
```

Description The event of the specified number is the current event.
Event number: 1 to 100
S point, R point: 1
E point: 0

:ANALysis:EVENt:CURRent:NOTE

Function Sets the event note or queries the current setting.

Syntax
```
:ANALysis:EVENt:CURRent
:NOTE {<Character string>}
:ANALysis:EVENt:CURRent:NOTE?
<Character string> = up to 36 characters
```

Example
```
:ANALysis:EVENt:CURRent:NOTE "aaa"
:ANALysis:EVENt:CURRent:NOTE?
-> :ANAL:EVEN:CURR:NOTE "123"
```

Description The index number must be set ahead of time with the :ANALysis:EVENt:CURRent:INDex command before using this command.
Enter a comment for the current event.
You can enter the comment using up to 36 characters.

:ANALysis:EVENt:IOR

Function Sets the section IOR of the current event or queries the current setting.

Syntax
```
:ANALysis:EVENt:IOR {<NRf>}
:ANALysis:EVENt:IOR?
<NRf> = 1.30000 to 1.79999
(steps of 0.00001)
```

Example
```
:ANALysis:EVENt:IOR 1.47:ANALysis
:EVENt:IOR?
-> :ANAL:EVEN:GIND 1.46000
```

:ANALysis:EVENt:CURRent:DISTance?

Function Retrieves the distance of the current event.

Syntax
```
:ANALysis:EVENt:CURRent:DISTance?
```

Example
```
:ANALYSIS:EVENT:CURRENT:DISTANCE?
-> 987.000
```

Description The index number must be set ahead of time with the :ANALysis:EVENt:CURRent:INDex command before using this command.

:ANALysis:EVENt:CURRent:LOSS?

Function Retrieves the splice loss of the current event.

Syntax
```
:ANALysis:EVENt:CURRent:LOSS?
```

Example
```
:ANALYSIS:EVENT:CURRENT:LOSS?
-> 2.000
```

Description The index number must be set ahead of time with the :ANALysis:EVENt:CURRent:INDex command before using this command.

:ANALysis:EVENt:CURRent:RETurnloss?

Function Retrieves the return loss of the current event.

Syntax
```
:ANALysis:EVENt:CURRent:RETurnloss?
```

Example
```
:ANALYSIS:EVENT:CURRENT:RETURNLOSS?
-> 2.000
```

Description The index number must be set ahead of time with the :ANALysis:EVENt:CURRent:INDex command before using this command.

:ANALysis:EVENt:CURRent:CUMLoss?

Function Retrieves the accumulated loss of the current event.
Syntax :ANALysis:EVENt:CURRent:CUMLoss?
Example :ANALYSIS:EVENT:CURRENT:CUMLOSS?
-> 1.810
Description The index number must be set ahead of time with the :ANALysis:EVENt:CURRent:INDex command before using this command.

:ANALysis:EVENt:CURRent:UNITloss?

Function Retrieves the loss per unit (dB/m) of the current event.
Syntax :ANALysis:EVENt:CURRent:UNITloss?
Example :ANALYSIS:EVENT:CURRENT:UNITLOSS?
-> 2.000
Description The index number must be set ahead of time with the :ANALysis:EVENt:CURRent:INDex command before using this command.

:ANALysis:EVENt:CURRent:TYPE?

Function Retrieves the event type of the current event.
Syntax :ANALysis:EVENt:CURRent:TYPE?
Example :ANALYSIS:EVENT:CURRENT:TYPE?
-> REFLECTANCE
Description The index number must be set ahead of time with the :ANALysis:EVENt:CURRent:INDex command before using this command.
Reflection: REFLectance
Positive loss: SPLus
Negative loss: SMINus

:ANALysis:EVENt:CURRent:IOR?

Function Retrieves the section IOR of the current event.
Syntax :ANALysis:EVENt:CURRent:IOR?
Example :ANALYSIS:EVENT:CURRENT:IOR?
-> 1.46000
Description The index number must be set ahead of time with the :ANALysis:EVENt:CURRent:INDex command before using this command.

:ANALysis:EVENt:DELete

Function Deletes the current event.
Syntax :ANALysis:EVENt:DELete
Example :ANALysis:EVENt:DELete

:ANALysis:EVENt:INSert

Function Inserts the event at the cursor position.
Syntax :ANALysis:EVENt:INSert
Example :ANALysis:EVENt:INSert

:ANALysis:FEDetection

Function Sets the fault event display or queries the current setting.
Syntax :ANALysis:FEDetection {<Boolean>}
:ANALysis:FEDetection?
Example :ANALysis:FEDetection ON
:ANALysis:FEDetection?
-> :ANAL:FED 0

:ANALysis:FMARker:DELete

Function Deletes the marker.
Syntax :ANALysis:FMARker:DELete
Example :ANALysis:FMARker:DELete

:ANALysis:FMARker:LMTechnique

Function Sets the approximation method of the marker or queries the current setting.
Syntax :ANALysis:FMARker
:LMTechnique {LSA|TPA}
:ANALysis:FMARker:LMTechnique?
Example :ANALysis:FMARker:LMTechnique LSA
:ANALysis:FMARker:LMTechnique?
-> :ANAL:FMAR:LMT TPA
Description Least squares approximation: LSA
Two point approximation: TPA

:ANALysis:FMARker:LOSS?

Function Queries the splice loss.
Syntax :ANALysis:FMARker:LOSS?
Example :ANALysis:FMARker:LOSS?
-> :ANAL:FMAR:LOSS 162.00000E-03

:ANALysis:FMARker:RETurnloss:VALue?

Function Queries the return loss.
Syntax :ANALysis:FMARker:RETurnloss:VALue?
Example :ANALysis:FMARker:RETurnloss:VALue?
-> :ANAL:FMAR:RET:VAL 47.003000E+00

:ANALysis:FMARker:RETurnloss:SATurated?

Function Queries the saturation of the return loss.
Syntax :ANALysis:FMARker:RETurnloss
:SATurated?
Example :ANALysis:FMARker:RETurnloss
:SATurated?
-> :ANAL:FMAR:RET:SAT 1
Description Unsaturated: 0
Saturated: 1

:ANALysis:FMARker:REFLection:VALue?

Function Queries the reflection level.
Syntax :ANALysis:FMARker:REFLection:VALue?
Example :ANALysis:FMARker:REFLection:VALue?
-> :ANAL:FMAR:REFL:VAL 1.0640000E+00

:ANALysis:FMARker:REFLection:SATurated?

Function Queries the saturation of the reflection level.
Syntax :ANALysis:FMARker:REFLection:SATurated?
Example :ANALysis:FMARker:REFLection:SATurated?
-> :ANAL:FMAR:REFL:SAT 0
Description Unsaturated: 0
Saturated: 1

:ANALysis:FMARker:LEFT:LOSS?

Function Queries the loss between markers 1 and 2.
Syntax :ANALysis:FMARker:LEFT:LOSS?
Example :ANALysis:FMARker:LEFT:LOSS?
-> :ANAL:FMAR:LEFT
:LOSS 137.00000E-03

:ANALysis:FMARker:LEFT:DISTance?

Function Queries the distance between markers 1 and 2.
Syntax :ANALysis:FMARker:LEFT:DISTance?
Example :ANALysis:FMARker:LEFT:DISTance?
-> :ANAL:FMAR:LEFT
:DIST 490.20000E+00

:ANALysis:FMARker:LEFT:UNITloss?

Function Queries the slope between markers 1 and 2.
Syntax :ANALysis:FMARker:LEFT:UNITloss?
Example :ANALysis:FMARker:LEFT:UNITloss?
-> :ANAL:FMAR:LEFT
:UNIT 279.00000E-03

:ANALysis:FMARker:RIGHt:LOSS?

Function Queries the loss between markers 2 and 3.
Syntax :ANALysis:FMARker:RIGHt:LOSS?
Example :ANALysis:FMARker:RIGHt:LOSS?
-> :ANAL:FMAR:RIGH
:LOSS -159.00000E-03

:ANALysis:FMARker:RIGHt:DISTance?

Function Queries the distance between markers 2 and 3.
Syntax :ANALysis:FMARker:RIGHt:DISTance?
Example :ANALysis:FMARker:RIGHt:DISTance?
-> :ANAL:FMAR:RIGH
:DIST 232.95000E+00

:ANALysis:FMARker:RIGHt:UNITloss?

Function Queries the slope between markers 2 and 3.
Syntax :ANALysis:FMARker:RIGHt:UNITloss?
Example :ANALysis:FMARker:RIGHt:UNITloss?
-> :ANAL:FMAR:RIGH
:UNIT -683.00000E-03

:ANALysis:FMARker:SET:M<x>

Function Sets the marker or queries the current setting.
Syntax :ANALysis:FMARker:SET:M<x>
:ANALysis:FMARker:SET:M<x>?
<x> = 1,2,3
Example :ANALysis:FMARker:SET:M1
:ANALysis:FMARker:SET:M1?
-> ANAL:FMAR:SET:M1 7.2648300E+03

:ANALysis:FMARker:SET:Y<x>

Function Sets the auxiliary marker or queries the current setting.
Syntax :ANALysis:FMARker:SET:Y<x>
:ANALysis:FMARker:SET:Y<x>?
<x> = 1,2,3
Example :ANALysis:FMARker:SET:Y2
:ANALysis:FMARker:SET:Y2?
-> ANAL:FMAR:SET:Y2 6.1786000E+03

:ANALysis:REFerence:DELete

Function Deletes the distance reference.
Syntax :ANALysis:REFerence:DELete
Example :ANALysis:REFerence:DELete

:ANALysis:REFerence:DISTance

Function Sets the distance reference.
Syntax :ANALysis:REFerence:DISTance
Example :ANALysis:REFerence:DISTance

:ANALysis:THReshold:EOFiber

Function Sets the threshold level of the end of fiber or queries the current setting.
Syntax :ANALysis:THReshold:EOFiber {<NRf>}
:ANALysis:THReshold:EOFiber?
<NRf> = 3 to 10
Example :ANALysis:THReshold:EOFiber 5
:ANALysis:THReshold:EOFiber?
-> :ANAL:THR:EOF 10

:ANALysis:THReshold:FERLoss

Function Sets the threshold level of the return loss of the fault event or queries the current setting.
Syntax :ANALysis:THReshold:FERLoss {<NRf>}
:ANALysis:THReshold:FERLoss?
<NRf> = 20 to 70
Example :ANALysis:THReshold:FERLoss 50
:ANALysis:THReshold:FERLoss?
-> :ANAL:THR:FERL 30

:ANALysis:THReshold:FESLoss

Function Sets the threshold level of the splice loss of the fault event or queries the current setting.

Syntax
```
:ANALysis:THReshold:FESLoss {<NRf>}
:ANALysis:THReshold:FESLoss?
```
<NRf> = 0.01 to 9.99

Example
```
:ANALysis:THReshold:FESLoss 0.01
:ANALysis:THReshold:FESLoss?
-> :ANAL:THR:FESL 1.23
```

:ANALysis:THReshold:RLOSs

Function Sets the threshold level of the return loss or queries the current setting.

Syntax
```
:ANALysis:THReshold:RLOSs {<NRf>}
:ANALysis:THReshold:RLOSs?
```
<NRf> = 20 to 70

Example
```
:ANALysis:THReshold:RLOSs 50
:ANALysis:THReshold:RLOSs?
-> :ANAL:THR:RLOS 30
```

:ANALysis:THReshold:SLOSs

Function Sets the threshold level of the splice loss or queries the current setting.

Syntax
```
:ANALysis:THReshold:SLOSs {<NRf>}
:ANALysis:THReshold:SLOSs?
```
<NRf> = 0.01 to 9.99

Example
```
:ANALysis:THReshold:SLOSs 0.01
:ANALysis:THReshold:SLOSs?
-> :ANAL:THR:SLOS 1.23
```

:ANALysis:SECTion:STARt

Function Sets the start position of the section data or queries the current setting.

Syntax
```
:ANALysis:SECTion:STARt {<NRf>}
:ANALysis:SECTion:STARt?
```
<NRf> = start position

Example
```
:ANALysis:SECTion:STARt
:ANALysis:SECTion:STARt?
-> :ANAL:SECT:STAR 39.736870E+03
```

:ANALysis:SECTion:END

Function Sets the end position of the section data or queries the current setting.

Syntax
```
:ANALysis:SECTion:END {<NRf>}
:ANALysis:SECTion:END?
```
<NRf> = end position

Example
```
:ANALysis:SECTion:END
:ANALysis:SECTion:END?
-> :ANAL:SECT:END 119.99912E+03
```

:ANALysis:SECTion:LOSS?

Function Queries the loss in the section data.

Syntax
```
:ANALysis:SECTion:LOSS?
```

Example
```
:ANALysis:SECTion:LOSS?
-> :ANAL:SECT:LOSS 7.9300000E+00
```

:ANALysis:SECTion:RETurnloss:VALue?

Function Queries the return loss in the section data.

Syntax
```
:ANALysis:SECTion:RETurnloss:VALue?
```

Example
```
:ANALysis:SECTion:RETurnloss:VALue?
-> :ANAL:SECT:RET:VAL 48.250000E+00
```

:ANALysis:SECTion:RETurnloss:SATurated?

Function Queries the saturation of the return loss in the section data.

Syntax
```
:ANALysis:SECTion:RETurnloss
:SATurated?
```

Example
```
:ANALysis:SECTion:RETurnloss
:SATurated?
-> :ANAL:SECT:RET:SAT 1
```

:ANALysis:SECTion:DISTance?

Function Queries the distance of the section data.

Syntax
```
:ANALysis:SECTion:DISTance?
```

Example
```
:ANALysis:SECTion:DISTance?
-> :ANAL:SECT:DIST 80.262240E+03
```

:ANALysis:SECTion:REFerence

Function Sets the reference point of the section data.

Syntax
```
:ANALysis:SECTion:REFerence
```

Example
```
:ANALysis:SECTion:REFerence
```

:ANALysis:SECTion:LMTechnique

Function Sets the approximation method of the section analysis or queries the current setting.

Syntax
```
:ANALysis:SECTion:LMTechnique
:ANALysis:SECTion:LMTechnique?
```

Example
```
:ANALysis:SECTion:LMTechnique
:ANALysis:SECTion:LMTechnique?
-> :ANAL:SECT:LMT LSA
```

Description
Least squares approximation: LSA
Two point approximation: TPA

:ANALysis:SECTion:DELete

Function Clears the section analysis data.

Syntax
```
:ANALysis:SECTion:DELete
```

Example
```
:ANALysis:SECTion:DELete
```

:ANALysis:SECTion:BASelevel?

Function Queries the dB value of the reference point of the section data.

Syntax
```
:ANALysis:SECTion:BASelevel?
```

Example
```
:ANALysis:SECTion:BASelevel?
-> :ANAL:SECT:BASE 34.268000E+00
```

:ANALysis:TRACefix:STATe

Function Sets the tracefix or queries the current setting.

Syntax
```
:ANALysis:TRACefix:
STATe {<Boolean>}
```

Example
```
:ANALysis:STRACefix:STATe ON
:ANALysis:STRACefix:STATe?
-> :ANALysis:STRACefix:STATe 1
```

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? -> :COM:HEAD 1;VERB 0

:COMMunicate:HEADer

Function Sets whether to include a header in the response to a query or queries the current setting.
Syntax :COMMunicate:HEADer {<Boolean>}
:COMMunicate:HEADer?
Example :COMMUNICATE:HEADER ON
:COMMUNICATE:HEADER? ->:COMM:HEAD 1

:COMMunicate:VERBose

Function Sets whether to return the response in full or abbreviated form or queries the current setting.
Syntax :COMMunicate:VERBose {<Boolean>}
:COMMunicate:VERBose?
Example :COMMUNICATE:VERBOSE ON
:COMMUNICATE:VERBOSE?
->:COMM:VERB 0

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 is used.

:DISPlay:ALINe

Function Sets the display of the approximation line or queries the current setting.
Syntax :DISPlay:ALINe {<Boolean>}
:DISPlay:ALINe?
Example :DISPlay:ALINe ON
:DISPlay:ALINe? -> :DISP:ALIN 0

:DISPlay:COLor

Function Sets the screen color or queries the current setting.
Syntax :DISPlay:COLor {COLOR1|COLOR2|COLOR3|BLACKWHITE}
:DISPlay:COLor?
Example :DISPlay:COLor COLOR1
:DISPlay:COLor? -> :DISP:COL COLOR2
Description Setting the screen color
Color 1: COLOR1
Color 2: COLOR2
Color 3: COLOR3
B & W: BLACKWHITE

:DISPlay:CURSor:DBValue

Function Sets the dB value of cursor or queries the current setting..
Syntax :DISPlay:CURSor:DBValue {<Boolean>}
:DISPlay:CURSor:DBValue?
Example :DISPlay:CURSor:DBValue ON
:DISPlay:CURSor:DBValue?
-> :DISPlay:CURSor:DBValue 1

:DISPlay:CURSor:SECond

Function Sets the secondary cursor display or queries the current setting.
Syntax :DISPlay:CURSor:SECond {<Boolean>}
:DISPlay:CURSor:SECond?
Example :DISPlay:CURSor:SECond ON
:DISPlay:CURSor:SECond?
-> :DISP:CURS:SEC 1

:DISPlay:CURSor:TYPE

Function Sets the cursor type or queries the current setting.
Syntax :DISPlay:CURSor:TYPE {CROSS|LINE}
:DISPlay:CURSor:TYPE?
Example :DISPlay:CURSor:TYPE LINE
:DISPlay:CURSor:TYPE?
-> :DISP:CURS:TYPE CROSS
Description Cross (+): CROSS
Line (|): LINE

:DISPlay:DECibel:UPPer

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

Syntax
```
:DISPlay:DECibel:UPPer {<NRf>}
:DISPlay:DECibel:UPPer?
<NRf> = 1.6 to 70
(8 times of dB/Div scale to 70)
```

Example
```
:DISPlay:DECibel:UPPer 60
:DISPlay:DECibel:UPPer?
-> :DISP:DEC:UPP 50.0
```

Description The range that you can specify varies depending on the vertical zoom rate.

:DISPlay:DIGit:DECibel

Function Sets dB display digit or queries the current setting.

Syntax
```
:DISPlay:DIGit
:DECibel {DIGIT1|DIGIT2|DIGIT3}
:DISPlay:DIGit:DECibel?
```

Example
```
:DISPlay:DIGit:DECibel DIGIT3
:DISPlay:DIGit:DECibel?
-> :DISP:DIG:DEC DIGIT1
```

Description
**.*: DIGIT1
.: DIGIT2
.*: DIGIT3

:DISPlay:DIGit:DISTance

Function Sets the distance display unit or queries the current setting.

Syntax
```
:DISPlay:DIGit:DISTance
{DIGIT3|DIGIT4|DIGIT5}
:DISPlay:DIGit:DISTance?
```

Example
```
:DISPlay:DIGit:DISTance DIGIT5
:DISPlay:DIGit:DISTance?
-> :DISP:DIG:DIST DIGIT4
```

Description
.*: DIGIT3
Displays the value with four decimal digits.
.**: DIGIT4
.***: DIGIT5

:DISPlay:DISTance:LEFT

Function Sets the display start distance or queries the current setting.

Syntax
```
:DISPlay:DISTance:LEFT {<NRf>}
:DISPlay:DISTance:LEFT?
```

Example
```
:DISPlay:DISTance:LEFT 1000
:DISPlay:DISTance:LEFT?
-> :DISP:DIST:LEFT 498.97000E+00
```

Description The range that you can specify varies depending on the horizontal zoom rate.

:DISPlay:DIVide:DECibel

Function Sets the vertical zoom rate or queries the current setting.

Syntax
```
:DISPlay:DIVide:DECibel {<NRf>}
:DISPlay:DIVide:DECibel?
<NRf> = 0.2 to 7.5
(0.2, 0.5, 1.0, 2.0, 5.0, 7.5)
```

Example
```
:DISPlay:DIVide:DECibel 5.0
:DISPlay:DIVide:DECibel?
-> :DISP:DIV:DEC 1.0
```

:DISPlay:DIVide:DISTance

Function Sets the horizontal zoom rate or queries the current setting.

Syntax
```
:DISPlay:DIVide:DISTance {<NRf>}
:DISPlay:DIVide:DISTance?
<NRf> = 1m to 40km
```

Example
```
:DISPlay:DIVide:DISTance 2000
:DISPlay:DIVide:DISTance?
-> :DISP:DIV:DIST 10.0E+03
```

Description The range that you can specify varies depending on the distance range.

400 k range:	50 m to 40 km
300 k range:	50 m to 30 km
200 k range:	50 m to 20 km
100 k range:	50 m to 10 km
50 k range:	20 m to 5 km
20 k range:	10 m to 2 km
10 k range:	5 m to 1 km
5 k range:	5 m to 500 m
2 k range:	2 m to 200 m
1 k range:	1 m to 100 m
500 m range:	1 m to 50 km

:DISPlay:GTYPe

Function Sets grid display or queries the current setting.

Syntax
```
:DISPlay:GTYPe {OFF|LINE|DOTS}
:DISPlay:GTYPe?
```

Example
```
:DISPlay:GTYPe OFF
:DISPlay:GTYPe? -> :DISP:GTYP 0
```

Description

Disable:	OFF
Line:	LINE
Dots:	DOTS

:DISPlay:IMARk

Function Sets the marker information display or queries the current setting.

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

Example
```
:DISPlay:IMARk ON
:DISPlay:IMARk? -> :DISP:IMAR 1
```

:DISPlay:ISCale

Function Initializes the display scale.

Syntax
```
:DISPlay:ISCale
```

Example
```
:DISPlay:ISCale
```

:DISPlay:OVERview

Function Sets overview display or queries the current setting.

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

Example
```
:DISPlay:OVERview ON
:DISPlay:OVERview? -> :DISP:OVER 1
```

:DISPlay:WAVE:TYPE

Function Sets the waveform type display format or queries the current setting.

Syntax
```
:DISPlay:WAVE:TYPE {LINE|DOT}
:DISPlay:WAVE:TYPE?
```

Example
```
:DISPlay:WAVE:TYPE LINE
:DISPlay:WAVE:TYPE?
-> :DISP:WAV:TYPE DOT
```

Description You can select the waveform display type from the following.

Connects the sampling data with lines for the display:	LINE
Displays the sampled data with dots:	DOT

FILE Group

The commands in this group deal with the saving of data and loading of the saved data. You can make the same settings and inquiries as when the front panel is used.

:FILE:DELete:EXECute

Function Deletes the file.
Syntax :FILE:DELete
:EXECute {<Character string>}
<Character string> = Filename
Example :FILE:DELete:EXECute "1.SOR"
Description You can also delete folders.

:FILE:DRIVe:FREE?

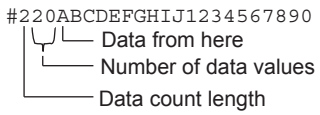
Function Queries the free space on the current drive.
Syntax :FILE:DRIVe:FREE?
Example :FILE:DRIVe:FREE? -> 1234567
Description The value is in bytes.

:FILE:DRIVe:SET

Function Sets the current drive or queries the current setting.
Syntax :FILE:DRIVe:SET {INTERNAL|USB|NETWORK}
:FILE:DRIVe:SET?
Example :FILE:DRIVe:SET USB
:FILE:DRIVe:SET?
-> :FILE:DRIV:SET INTERNAL
Description You can select the following medium types for saving or loading the waveform.
Internal memory: INTERNAL
USB memory: USB

:FILE:FILE:GET?

Function Retrieves the specified file.
Syntax :FILE:FILE:GET?
Example :FILE:FILE:GET?
-> #220ABCDEFGHIJ1234567890
Description A block data header is attached to the front of the loaded data.



:FILE:FILE:NAME

Function Specifies the file name for the file retrieval, file size retrieval, and file transmission.
Syntax :FILE:FILE
:NAME {<Character string>}
:FILE:FILE:NAME?
Example :FILE:FILE:NAMe "0.SOR"
:FILE:FILE:NAMe?
-> :FILE:FILE:NAME "0.sor"
Description The following characters cannot be used in a folder name.
", *, /, :, <, >, ?, \, and |
The following character strings cannot be used in a folder name.
"AUX", "CON", "PRN", "NUL", "CLOCK", "LPT1", "LPT2", "LPT3", "LPT4", "LPT5", "LPT6", "LPT7", "LPT8", "LPT9", "COM1", "COM2", "COM3", "COM4", "COM5", "COM6", "COM7", "COM8", and "COM9"

:FILE:FILE:SIZE?

Function Retrieves the size of the specified file.
Syntax :FILE:FILE:SIZE?
Example :FILE:FILE:SIZE?
-> :FILE:FILE:SIZE 230781

:FILE:FOLDer:MAKE

Function Creates a folder.
Syntax :FILE:FOLDer
:MAKE {<Character string>}
<Character string> = Folder name
Example :FILE:FOLDer:MAKE "Data"

:FILE:FOLDer:PATH

Function Sets the current folder name or queries the current setting.
Syntax :FILE:FOLDer
:PATH {<Character string>}
:FILE:FOLDer:PATH?
<Character string> = Folder name
Example :FILE:FOLDer:PATH "AQ7270"
:FILE:FOLDer:PATH?
-> :FILE:FOLD:PATH "AQ7270"
Description Moves one level at a time from the current folder (specify ".." to move one level up).
The following characters cannot be used in a folder name.
", *, /, :, <, >, ?, \, and |
The following character strings cannot be used in a folder name.
"AUX", "CON", "PRN", "NUL", "CLOCK", "LPT1", "LPT2", "LPT3", "LPT4", "LPT5", "LPT6", "LPT7", "LPT8", "LPT9", "COM1", "COM2", "COM3", "COM4", "COM5", "COM6", "COM7", "COM8", and "COM9"

:FILE:FOLDer:LIST?

Function Retrieves the current folder list.
Syntax :FILE:FOLDer:LIST?
Example :FILE:FOLDER:LIST?
-> :FILE:FOLDER:LIST "3,ABC.SOR, DEF.SOR,MACRO/"
Description The information is returned as follows: the number of files/folders, file or folder, ..., file or folder. Folders are returned with a slash at the end of the folder name.

:FILE:SUBFolder:LIST?

Function Retrieves the sub folder list in the current folder.
Syntax :FILE:SUBFolder:LIST?
Example :FILE:SUBFOLDER:LIST?
-> :FILE:SUBFOLDER: LIST "3,ABC/,DEF/,MACRO/"
Description The information is returned as follows: the number of folders, folder, ..., folder. Folders are returned with a slash at the end of the folder name.

:FILE:LOAD:EXECute

Function Loads the file.
Syntax :FILE:LOAD
:EXECute {<Character string>}
<Character string> = File name
Example :FILE:LOAD:EXECute "1.SOR"
<Character string> = File name

:FILE:SAVE:COMMent

Function Sets the comment to be saved or queries the current setting.
Syntax :FILE:SAVE
:COMMent {<Character string>}
:FILE:SAVE:COMMent?
Example :FILE:SAVE:COMMent "AQ7270_"
:FILE:SAV:COMM "AQ7270_"
Description You can use up to 30 characters.

:FILE:SAVE:EXECute

Function Saves the file.
Syntax :FILE:SAVE:EXECute
Example :FILE:SAVE:EXECute
Description To check errors after a save, send the STATus:ERRor command after files are done being accessed with STATus:CONDition?.

:FILE:SAVE:ID

Function Sets the management number to be saved or queries the current setting.
Syntax :FILE:SAVE:ID {<NRf>}
:FILE:SAVE:ID?
<NRf> = 0 to 9999
Example :FILE:SAVE:ID 100
:FILE:SAVE:ID? -> :FILE:SAV:ID 100

:FILE:SAVE:TYPE

Function Sets the file name type to be saved or queries the current setting.
Syntax :FILE:SAVE:TYPE {NO|COMMENT|CMNO|NOCM|CMWLNO|NOCMWL|WLCMNO}
:FILE:SAVE:TYPE?
Example :FILE:SAVE:TYPE COMMENT
:FILE:SAVE:TYPE?
-> :FILE:SAV:TYPE CMWLNO
Description You can select the following file name types when saving the waveform.

Number:	NO
Comment:	COMMENT
Comment+number:	CMNO
Number+comment:	NOCM
Comment+wavelength+number:	CMWLNO
Number+comment+wavelength:	NOCMWL
Wavelength+comment+number:	WLCMNO

:FILE:SAVE:SUB

Function Sets the sub number to be saved or queries the current setting.
Syntax :FILE:SAVE
:SUB {OFF|AB|AC|AD|AE|AF|AG |AH}
:FILE:SAVE:SUB?
Example :FILE:SAVE:SUB AH
:FILE:SAVE:SUB?
-> :FILE:SAV:SUB OFF
Description OFF: OFF
a-b: AB
a-c: AC
a-d: AD
a-e: AE
a-f: AF
a-g: AG
a-h: AH

:FILE:TYPE

Function Sets the file type to be saved or queries the current setting.
Syntax :FILE:TYPE {SET|SOR|CSV_WAVE|CSV_EVENT|BMP|PNG|JPG|CFG|MAC}
:FILE:TYPE?
Example :FILE:TYPE SOR
:FILE:TYPE? -> :FILE:TYPE CSV_WAVE
Description You can select the following file types when saving the waveform.

A measurement condition file:	SET
A file conforming to Telcoria SR-4731:	SOR
A CSV file:	CSV_WAVE
A CSV file:	CSV_EVENT
A BMP file:	BMP
A PNG file:	PNG
A JPG file:	JPG
A setting file:	CFG
A macro file:	MAC

LABel Group

The commands in this group deal with labels. You can make the same settings and inquiries as when the front panel is used.

:LABel:CABLe:CODE

Function Sets the cable code or queries the current setting.

Syntax
```
:LABel:CABLe
:CODE {<Character string>}
:LABel:CABLe:CODE?
```
<Character string> = up to 36 characters

Example
```
:LABel:CABLe:CODE "aaa"
:LABel:CABLe:CODE?
->:LAB:CABL:COD "123"
```

Description You can use up to 36 characters.

:LABel:CABLe:ID

Function Sets the cable ID or queries the current setting.

Syntax
```
:LABel:CABLe
:ID {<Character string>}
:LABel:CABLe:ID?
```
<Character string> = up to 36 characters

Example
```
:LABel:CABLe:ID "aaa"
:LABel:CABLe:ID?
->:LAB:CABL:ID "123"
```

Description You can use up to 36 characters.

:LABel:COMPany

Function Sets the company name or queries the current setting.

Syntax
```
:LABel:COMPany {<Character string>}
:LABel:COMPany?
```
<Character string> = up to 36 characters

Example
```
:LABel:COMPany "aaa"
:LABel:COMPany? ->:LAB:COMP "123"
```

Description You can use up to 36 characters.

:LABel:DFLag:CURRent

Function Sets the current data flag or queries the current setting.

Syntax
```
:LABel:DFLag:CURRent {BC|RC|OT|CC}
:LABel:DFLag:CURRent?
```

Example
```
:LABel:DFLag:CURRent BC
:LABel:DFLag:CURRent?
->:LAB:DFL:CURR RC
```

Description
- as-Built Condition: BC
- as-Repaired Condition: RC
- Other: OT
- Current Condition: CC

:LABel:FIBer:ID

Function Sets the fiber ID or queries the current setting.

Syntax
```
:LABel:FIBer
:ID {<Character string>}
:LABel:FIBer:ID?
```
<Character string> = up to 36 characters

Example
```
:LABel:FIBer:ID "aaa"
:LABel:FIBer:ID?
->:LAB:FIB:ID "123"
```

Description You can use up to 36 characters.

:LABel:FIBer:TYPE

Function Sets the fiber type or queries the current setting.

Syntax
```
:LABel:FIBer
:TYPE {SMF|DSF|NZ_DSF|MMF}
:LABel:FIBer:TYPE?
```

Example
```
:LABel:FIBer:TYPE SMF
:LABel:FIBer:TYPE?
->:LAB:FIB:TYPE MMF
```

Description Setting optical fiber cable typesthe Fiber Type
- Single mode fiber :SMF
- Dispersion shifted fiber :DSF
- Non-zero dispersion shifted single-mode fiber : NZ_DSF
- Multi-mode fiber :MMF

:LABel:LABel

Function Sets the label or queries the current setting.

Syntax
```
:LABel:LABel {<Character string>}
:LABel:LABel?
```
<Character string> = up to 36 characters

Example
```
:LABel:LABel "aaa"
:LABel:LABel? -> :LAB:LAB "123"
```

Description You can use up to 36 characters.

:LABel:LOCation:ORIGinating

Function Sets the start position label or queries the current setting.

Syntax
```
:LABel:LOCation
:ORIGinating {<Character string>}
:LABel:LOCation:ORIGinating?
```
<Character string> = up to 36 characters

Example
```
:LABel:LOCation:ORIGinating "aaa"
:LABel:LOCation:ORIGinating?
-> :LAB:LOC:ORIG "123"
```

Description You can use up to 36 characters.

:LABel:LOCation:TERMinating

Function Sets the stop position label or queries the current setting.

Syntax
```
:LABel:LOCation
:TERMinating {<Character string>}
:LABel:LOCation:TERMinating?
```
<Character string> = up to 36 characters

Example
```
:LABel:LOCation:TERMinating "aaa"
:LABel:LOCation:TERMinating?
-> :LAB:LOC:TERM "123"
```

Description You can use up to 36 characters.

:LABel:OPERator

Function Sets the name or queries the current setting.

Syntax
```
:LABel
:OPERator {<Character string>}
:LABel:OPERator?
```
<Character string> = up to 36 characters

Example
```
:LABel:OPERator "aaa"
:LABel:OPERator? -> :LAB:OPER "123"
```

Description You can use up to 36 characters.

MENU Group

The commands in this group are used to set the function or marker mode or query the settings.

:MENU:ERRor:CLEar

Function Deleting the error dialog display

Syntax
```
:MENU:ERRor:CLEar
```

Example
```
:MENU:ERROR:CLEAR
```

:MENU:FUNCtion

Function Sets the function mode or queries the current setting.

Syntax
```
:MENU:FUNCtion {LIGHT|MACRO|OTDR
POWER|TOP}
:MENU:FUNCtion?
```

Example
```
:MENU:FUNCtion OTDR
:MENU:FUNCtion? -> :MENU:FUNC POWER
```

Description

Top menu:	TOP
OTDR:	OTDR
Power monitor:	POWER
Light source:	LIGHT
Macro:	MACRO

:MENU:MARKer

Function Sets the marker mode or queries the current setting.

Syntax
```
:MENU:MARKer {TRACE|LINE}
:MENU:MARKer?
```

Example
```
:MENU:MARKer TRACE
:MENU:MARKer? -> :MEN:MARK LINE
```

MISC Group

The commands in this group deal with the date, time, language, and power management. You can make the same settings and inquiries as when the front panel is used.

:MISC:DATE:MODE

Function Sets the date display type to be saved or queries the current setting.

```
Syntax      :MISC:DATE:MODE {TYPE1|TYPE2}
            :MISC:DATE:MODE?
Example     :MISC:DATE:MODE TYPE1
            :MISC:DATE:MODE?
            -> :MISC:DATE:MODE TYPE2
```

Description Setting the display of date

2006/08/29 12:16: TYPE1

08/29/2006 12:16: TYPE2

:MISC:DATE:YEAR

Function Sets the year or queries the current setting.

```
Syntax      :MISC:DATE:YEAR {<NRf>}
            :MISC:DATE:YEAR?
            <NRf> = 2006 to 2036
Example     :MISC:DATE:YEAR 2006
            :MISC:DATE:YEAR?
            -> :MISC:DATE:YEAR 2006
```

Description This setting will come into effect when MISC:DATE:SET is executed.

:MISC:DATE:MONTh

Function Sets the month or queries the current setting.

```
Syntax      :MISC:DATE:MONTh {<NRf>}
            :MISC:DATE:MONTh?
            <NRf> = 1 to 12
Example     :MISC:DATE:MONTh 8
            :MISC:DATE:MONTh?
            -> MISC:DATE:MONT 8
```

Description This setting will come into effect when MISC:DATE:SET is executed.

:MISC:DATE:DAY

Function Sets the day or queries the current setting.

```
Syntax      :MISC:DATE:DAY {<NRf>}
            :MISC:DATE:DAY?
            <NRf> = 1 to 31
Example     :MISC:DATE:DAY 29
            :MISC:DATE:DAY?
            -> :MISC:DATE:DAY 19
```

Description This setting will come into effect when MISC:DATE:SET is executed.

:MISC:DATE:HOUR

Function Sets the hour or queries the current setting.

```
Syntax      :MISC:DATE:HOUR {<NRf>}
            :MISC:DATE:HOUR?
            <NRf> = 0 to 23
Example     :MISC:DATE:HOUR 17
            :MISC:DATE:HOUR?
            -> :MISC:DATE:HOUR 12
```

Description This setting will come into effect when MISC:DATE:SET is executed.

:MISC:DATE:MINute

Function Sets the minute or queries the current setting.

```
Syntax      :MISC:DATE:MINute {<NRf>}
            :MISC:DATE:MINute?
            <NRf> = 0 to 59
Example     :MISC:DATE:MINute 5
            :MISC:DATE:MINute?
            -> :MISC:DATE:MIN 59
```

Description This setting will come into effect when MISC:DATE:SET is executed.

:MISC:DATE:SET

Function Applies the date and time change.

```
Syntax      :MISC:DATE:SET
Example     :MISC:DATE:SET
```

:MISC:LANGuage

Function Sets the language or queries the current setting.

```
Syntax      :MISC:LANGuage {JAPANESE|ENGLISH|
            KOREAN}
            :MISC:LANGuage?
Example     :MISC:LANGuage ENGLISH
            :MISC:LANGuage? -> :MISC:LANG ENG
```

:MISC:LOCKout

Function Sets the local lockout or queries the current setting.

```
Syntax      :MISC:LOCKout {<Boolean>}
            :MISC:LOCKout?
Example     :MISC:LOCKout ON
            :MISC:LOCKout? -> :MISC:LOCK 0
```

:MISC:ALARmsound

Function Sets the alarm sound or queries the current setting.

```
Syntax      :MISC:ALARmsound {<Boolean>}
            :MISC:ALARmsound?
Example     :MISC:ALARMSOUND OFF
            :MISC:ALARMSOUND?
            -> :MISC:ALARMSOUND 1
```

:MISC:PSAVe

Function Sets the power save function when connecting the AC adapter or queries the current setting.

Syntax
```
:MISC:PSAVe {OFF|S30SEC|S3MIN|
S10MIN|S20MIN|A1MIN|A6MIN|A20MIN|
A40MIN}
:MISC:PSAVe?
```

Example
```
:MISC:PSAVe S20MIN
:MISC:PSAVe? -> :MISC:PSAV OFF
```

Description This command has the same function of :MISC:POWersave:AC command.

:MISC:POWersave:AC

Function Sets the power save when connecting the AC adapter or queries the current setting.

Syntax
```
:MISC:POWersave:AC{OFF|S30SEC|
S3MIN|S10MIN|S30MIN|A1MIN|A5MIN|
A10MIN|A30MIN}
:MISC:POWersave:AC?
```

Example
```
:MISC:POWERSAVE:AC S20MIN
:MISC:POWERSAVE:AC?
-> :MISC:POWERSAVE:AC OFF
```

Description

Disable:	OFF
Screen Save 30seconds:	S30SEC
Screen Save 3minutes:	S3MIN
Screen Save 10minutes:	S10MIN
Screen Save 30minutes:	S30MIN
Auto Power Off 1minute:	A1MIN
Auto Power Off 5minutes:	A5MIN
Auto Power Off 10minutes:	A10MIN
Auto Power Off 30minutes:	A30MIN.

:MISC:POWersave:BATTery

Function Sets the power save using the battery pack or queries the current setting.

Syntax
```
:MISC:POWersave:BATTery {OFF|
S30SEC|S3MIN|S10MIN|S30MIN|A1MIN|
A5MIN|A10MIN|A30MIN}
:MISC:POWersave:BATTery?
```

Example
```
:MISC:POWERSAVE:BATTERY S20MIN
:MISC:POWERSAVE:BATTERY?
-> :MISC:POWERSAVE:BATTERY OFF
```

Description This command has the same function of :MISC:POWersave:AC command.

:MISC:BRIGhtness:AC

Function Sets the LCD Brightness using the AC adapter or queries the current setting.

Syntax
```
:MISC:BRIGhtness:
AC {BRIGHT|NORMAL|DARK|OFF}:
MISC:BRIGhtness:AC?
```

Example
```
:MISC:BRIGHTNESS:AC NORMAL:
MISC:BRIGHTNESS:AC?
-> :MISC:BRIGHTNESS:AC NORMAL.
```

Description

Bright :	BRIGHT
Normal:	NORMAL
Power save:	DARK
Off:	OFF

With version 1.20 or later, the settings are those when the AC adapter is connected. Only the AQ7275 can be turned OFF.

:MISC:BRIGhtness:BATTery

Function Sets the LCD Brightness using the battery pack or queries the current setting.

Syntax
```
:MISC:BRIGhtness:BATTery
{BRIGHT|NORMAL|DARK|OFF}:MISC:
    BRIGhtness:BATTery?
```

Example
```
:MISC:BRIGHTNESS:BATTERY NORMAL
MISC:BRIGHTNESS:BATTERY?
-> :MISC:BRIGHTNESS:BATTERY NORMAL
```

Description The parameters are the same as those for: MISK:BRIGhtness:AC.

:MISC:LCD:BRIGhtness

Function Sets the LCD brightness or queries the current setting.

Syntax
```
:MISC:LCD:BRIGhtness
{BRIGHT|NORMAL|DARK|OFF}
:MISC:LCD:BRIGhtness?
```

Example
```
:MISC:LCD:BRIGhtness BRIGHT
:MISC:LCD:BRIGhtness?
-> :MISC:LCD:BRIG NORMAL
```

Description The parameters are the same as those for: MISK:BRIGhtness:AC.

:MISC:RLOSsmode

Function Sets the reflection display or queries the current setting.

Syntax
```
:MISC:RLOSsmode {NORMAL|NTT}
:MISC:RLOSsmode?
```

Example
```
:MISC:RLOSsmode NORMAL
:MISC:RLOSsmode? -> :MISC:RLOS NTT
```

Description

Return loss:	NORMAL
Reflection:	NTT

.

NETWork Group

:NETWork:CONTrol:PASSword

Function Sets the Password or queries the current setting.

Syntax
```
:NETWork:CONTrol:PASSword
<character string>
```

Example
```
:NETWORK:CONTROLl:PASSWORD "ABC"
:NETWORK:CONTROLl:PASSWORD?
-> :NETWORK:CONTROLl:PASSWORD "ABC"
```

Description It cannot be set if NETWork:STATe is turned OFF.
This command is enabled after restarting. You can restart by executing :SYSTem:REBoot.
A password is not required if the user name is “anonymous.’

:NETWork:CONTrol:TIMeout

Function Sets the Timeout Value or queries the current setting.

Syntax
```
:NETWork:CONTrol:TIMeout
{<NRf>|INFinite}:NETWork:CONTrol:
TIMeout?<NRf>:1~7200
```

Example
```
:NETWORK:CONTROL:TIMEOUT 30
:NETWORK:CONTROL:TIMEOUT? -> :
NETWORK:CONTROL:TIMEOUT 30
```

Description It cannot be set if NETWork:STATe is turned OFF.
This command is enabled in next connecting.

:NETWork:CONTrol:USERname

Function Sets the User Name or queries the current setting.

Syntax
```
:NETWork:CONTrol:USERname
<character string>
```

Example
```
:NETWORK:CONTROL:USERNAME
"anonymous"
:NETWORK:CONTROL:USERNAME?
->   :NETWORK:CONTROL:USERNAME
     "anonyumous"
```

Description It cannot be set if NETWork:STATe is turned OFF.
This command is enabled after restarting. You can restart by executing :SYSTem:REBoot.

:NETWork:DHCP

Function Sets enabling or disabling the DHCP function or queries the current setting.

Syntax
```
:NETWork:DHCP <Boolean>
:NETWork:DHCP?
```

Example
```
:NETWORK:DHCP ON
:NETWORK:DHCP? -> :NETWORK:DHCP 1
```

Description Invalid: OFF or 0
Valid: ON or 1
It cannot be set if NETWork:STATe is turned OFF.
This command is enabled after restarting. You can restart by executing :SYSTem:REBoot.

:NETWork:GATeway

Function Sets the gateway or queries the current setting.

Syntax
```
:NETWork:GATeway <
:NETWork:GATeway?
```

Example
```
:NETWORK:GATEWAY "255.255.255.0"
:NETWORK:GATEWAY?
-> :NETWORK:GATEWAY "255.255.255.0"
```

Description It cannot be set if NETWork:STATe is turned OFF.
It cannot be set if NETWork:DHCP is turned OFF.
This command is enabled after restarting. You can restart by executing :SYSTem:REBoot.

:NETWork:IPADdress

Function Sets the IP address or queries the current setting.

Syntax
```
:NETWork:IPADdress <
:NETWork:IPADdress?
```

Example
```
:NETWORK:IPADDRESS "192.168.0.1"
:NETWORK:IPADDRESS?
-> :NETWORK:IPADDRESS "192.168.0.1"
```

Description It cannot be set if NETWork:STATe is turned OFF.
It cannot be set if NETWork:DHCP is turned OFF.
This command is enabled after restarting. You can restart by executing :SYSTem:REBoot.

NETWork:NETMask

Function Sets the netmask or queries the current setting.

Syntax
```
:NETWork:NETMask <
:NETWork:NETMask?
```

Example
```
:NETWORK:NETMASK "255.255.255.0"
:NETWORK:NETMASK?
-> :NETWORK:NETMASK "255.255.255.0"
```

Description It cannot be set if NETWork:STATe is turned OFF.
It cannot be set if NETWork:DHCP is turned OFF.
This command is enabled after restarting. You can restart by executing :SYSTem:REBoot.

:NETWork:STATe

Function Sets enabling or disabling the Network or queries the current setting.

Syntax
```
:NETWork:STATe <Boolean>
:NETWork:STATe?
```

Example
```
:NETWORK:STATE ON
:NETWORK:STATE? -> :NETWORK:STATE 1
```

Description
Invalid: OFF or 0
Valid: ON or 1
This command is enabled after restarting. You can restart by executing :SYSTem:REBoot.

PRINt Group

The commands in this group deal with printing. You can make the same settings and inquiries as when the front panel is used.

:PRINt:COLor

Function Sets the print color or queries the current setting.

Syntax
```
:PRINt:COLor {COLOR|BW}
:PRINt:COLor?
```

Example
```
:PRINt:COLor COLOR
:PRINt:COLor? -> :PRINt:COL BW
```

Description
Display: COLOR
B & W: BW

:PRINt:DEVice

Function Sets the printer port or queries the current setting.

Syntax
```
:PRINt:DEVice {INTERNAL|USB}
:PRINt:DEVice?
```

Example
```
:PRINt:DEVice INTERNAL
:PRINt:DEVice? -> :PRIN:DEV USB
```

Description
Internal printer: INTERNAL
USB printer: USB
Cannot be selected on models without a built-in printer

:PRINt:MAKer

Function Sets the printer manufacturer or queries the current setting.

Syntax
```
:PRINt:MAKer {HP|EPSON|SEIKO}
:PRINt:MAKer?
```

Example
```
:PRINt:MAKer HP
:PRINt:MAKer? -> :PRIN:MAK EPSON
```

Description
HP: HP
EPSON: EPSON
SII MPU-L465: SEIKO

:PRINt:EVENtlist

Function Sets printing the event list or queries the current setting.

Syntax
```
:PRINt:EVENtlist {<Boolean>}
:PRINt:EVENtlist?
```

Example
```
:PRINt:EVENtlist ON
:PRINt:EVENtlist? -> :PRIN:EVEN 0
```

:PRINt:EXECute

Function Executes the printing.

Syntax
```
:PRINt:EXECute
```

Example
```
:PRINt:EXECute
```

SETup Group

The commands in this group deal with the initialization of the settings. You can reset the settings to factory default.

:SETup:INITialize

Function Initializes all the settings to factory default.

STATus Group

The commands in the STATus group are used to make settings and inquiries related to the communication status function. There are no front panel keys that correspond to the commands in this group.

:STATus?

Function Queries all settings related to the communication status function.

```
Syntax      :STATus?
Example     :STATUS? -> :STAT:QEN 1;QMES 1
```

:STATus:CONDition?

Function Queries the contents of the condition register.

```
Syntax      :STATus:CONDition?
Example     :STATUS:CONDITION? -> 16
```

Description For details on the condition register, see section 5.4, "Condition Register."

:STATus:ERRor?

Function Queries the error code and message information (top of the error queue).

```
Syntax      :STATus:ERRor?
Example     :STATUS:ERROR?
            ->113,"Undefined header"
```

:STATus:QENable

Function Sets whether to store messages other than errors to the error queue or queries the current setting.

```
Syntax      :STATus:QENable {<Boolean>}
            :STATus:QENable?
Example     :STATUS:QENABLE ON
            :STATUS:QENABLE? -> :STAT:QEN 1
```

:STATus:QMESsage

Function Sets whether or not to attach message information to the response to the ":STATus:ERRor?" query or queries the current setting.

```
Syntax      :STATus:QMESsage {<Boolean>}
            :STATus:QMESsage?
Example     :STATUS:QMESSAGE OFF
            :STATUS:QMESSAGE? -> :STAT:QMES 1
```

WAVedata Group

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

:WAVedata:LENGth?

Function Queries the number of waveform data values.
Syntax :WAVedata:LENGth?
Example :WAVedata:LENGth?
-> :WAV:LENG 25000

:WAVedata:DISPlay:SEND:ASCii?

Function Queries the display waveform data in ASCII format.
Syntax :WAVedata:DISPlay:SEND:ASCii?
Example :WAVedata:DISPlay:SEND:ASCii?
-> 0.000,1.234,•••

:WAVedata:DISPlay:SEND:BINary?

Function Queries the display waveform data in binary format.
Syntax :WAVedata:DISPlay:SEND:BINary?
Example :WAVedata:DISPlay:SEND:BINary?
-> #800000010ABCD•••
Description Block data format.

:WAVedata:OLDType:DISPlay:SEND?

Function Queries the display waveform data in Dot 4 format.
Syntax :WAVedata:OLDType:DISPlay:SEND?
Example :WAVedata:OLDType:DISPlay:SEND?
-> #42000•••
Description Block data format.

:WAVedata:OLDType:SEND?

Function Queries the waveform data in Dot 4 format.
Syntax :WAVedata:OLDType:SEND?
Example :WAVedata:OLDType:SEND?
-> #51000•••
Description Block data format.

:WAVedata:SEND:ASCii?

Function Queries the waveform data in ASCII format.
Syntax :WAVedata:SEND:ASCii?
Example :WAVedata:SEND:ASCii?
-> 0.000,1.234,•••

:WAVedata:SEND:BINary?

Function Queries the waveform data in binary format.
Syntax :WAVedata:SEND:BINary?
Example :WAVedata:SEND:BINary?
-> #6123456ABCD•••
Description Block data format.

WAVedata:SEND:STARt

Function Sets the start distance of the wavedata or queries the current setting.
Syntax :WAVedata:SEND:STARt {<NRf>}
:WAVedata:SEND:STARt?
<NRf> = 0 to the measurement distance (m)
Example :WAVEDATA:SEND:START 20000
:WAVEDATA:SEND:START?
-> :WAVEDATA:SEND:START 20000
Description Numbers exceeding the setting range are rounded.

:WAVedata:SEND:SIZE

Function Sets the number of waveform data to acquire or queries the current setting.
Syntax :WAVedata:SEND:END {<NRf>}
:WAVedata:SEND:END?
<NRf> = 1 to the number of measurement
Example :WAVEDATA:SEND:END {<NRF>}
:WAVEDATA:SEND:END?
-> :WAVEDATA:SEND:END 20000
<NRF> = 1 to the number of measurement
Description Numbers exceeding the setting range are rounded.

SYSTem Group

:SYSTem:REBoot

Function Execution of restarting
Syntax :SYSTem:REBoot
Example :SYSTEM:REBOOT

:SYSTem:SHUTdown

Function Execution of shutdown
Syntax :SYSTem:SHUTdown
Example :SYSTEM:SHUTDOWN

LIGHtsource Group

The commands in this group deal with the light source.
You can perform the same settings, operations, and inquiries as when the front panel is used.

:LIGHtsource:ABORt

Function Turns OFF the light source.
Syntax :LIGHtsource:ABORt
:LIGHtsource:ABORt

:LIGHtsource:EXECute

Function Turns ON the light source.
Syntax :LIGHtsource:EXECute
:LIGHtsource:EXECute

:LIGHtsource:MODulation

Function Sets the modulation frequency of the light source or queries the current setting.
Syntax :LIGHtsource
:MODulation {MOD_270HZ|MOD_CW}
:LIGHtsource:MODulation?
Example :LIGHtsource:MODulation MOD_270HZ
:LIGHtsource:MODulation?
-> :LIGH:MOD MOD_CW

:LIGHtsource:WAVelength

Function Sets the wavelength of the light source or queries the current setting.
Syntax :LIGHtsource:WAVelength {<NRf>}
:LIGHtsource:WAVelength?
<NRf> = 0.850um to 1.650um
(850E-9 to 1650E-9)
Example :LIGHtsource:WAVelength 0.85um
:LIGHtsource:WAVelength 1650E-9
:LIGHtsource:WAVelength 1.650E-6
:LIGHtsource:WAVelength?
-> :LIGH:WAV 1550E-09
Description The wavelength that you can specify varies depending on the model.

PMONitor Group

The commands in this group deal with the power monitor. You can make the same settings and inquiries as when the front panel is used.

:PMONitor:WAVelength

Function Sets the wavelength of the power monitor or queries the current setting.

```
Syntax    :PMONitor:WAVelength {<NRf>}
          :PMONitor:WAVelength?
          <NRf> = 0.850um to 1.650um
          (850E-9 to 1650E-9)
Example   :PMONitor:WAVelength 0.85um
          :PMONitor:WAVelength 1650E-9
          :PMONitor:WAVelength 1.650E-6
          :PMONitor:WAVelength?
          -> PMON:WAV 1550E-09
```

:PMONitor:ZERoset

Function Resets the power monitor to zero.

```
Syntax    :PMONitor:ZERoset
Example   :PMONitor:ZERoset
```

:PMONitor:DREF

Function Sets the reference value of the relative measurement of the power monitor.

```
Syntax    :PMONitor:DREF
Example   :PMONitor:DREF
```

:PMONitor:REFerence

Function Sets the power monitor reference or queries the current setting.

```
Syntax    :PMONitor:REFerence {<NRf>}
          :PMONitor:REFerence?
          <NRf> = -50 to -5
Example   :PMONitor:REFerence -45.00
          :PMONitor:REFerence?
          -> :PMON:REF -44.018
```

:PMONitor:OFFSet

Function Sets the power monitor offset or queries the current setting.

```
Syntax    :PMONitor:OFFSet {<NRf>}
          :PMONitor:OFFSet?
          <NRf> = -9.9 to 9.9
Example   :PMONitor:OFFSet -5.0
          :PMONitor:OFFSet?
          -> :PMON:OFFS -3.000
```

:PMONitor:THReshold

Function Sets the threshold level of the power monitor or queries the current setting.

```
Syntax    :PMONitor:THReshold {<NRf>}
          :PMONitor:THReshold?
          <NRf> = -50 to -5
Example   :PMONitor:THReshold -10
          :PMONitor:THReshold?
          -> :PMON:THR -10.000
```

:PMONitor:UNIT

Function Sets the display unit of the power monitor or queries the current setting.

```
Syntax    :PMONitor:UNIT {DB|DBM|W}
          :PMONitor:UNIT ?
Example   :PMONitor:UNIT DBM
          :PMONitor:UNIT ? -> :PMON:UNIT DB
```

:PMONitor:MEASurement:DATa?

Function Queries the measured result of the power monitor.

```
Syntax    :PMONitor:MEASurement:DATa?
Example   :PMONitor:MEASurement:DATa?
          -> :PMON:MEAS:DAT 26.566
```

5.4 Condition Register

The condition register indicates the internal condition of the instrument.

Condition Register
:STATus:CONDition?

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	PRT	LS	PME	PMZ	PMM	MCR	AR	PC	FIA	AS	FILE	AVE	REAL

The meaning of each bit of the condition register is as follows:

Bit 0	REAL	Set to 1 while the realtime measurement is in progress.
Bit 1	AVE	Set to 1 while the averaging measurement is in progress.
Bit 2	FILE	Set to 1 while a file is being accessed.
Bit 3	AS	Set to 1 while auto searching.
Bit 4	FIA	Set to 1 while checking whether the fiber is in use.
Bit 5	PC	Set to 1 while the plug is being checked.
Bit 6	AR	Set to 1 while the auto range measurement is in progress.
Bit 7	MCR	Set to 1 while a macro is in progress.
Bit 8	PMM	Set to 1 while the power monitor measurement is in progress.
Bit 9	PMZ	Set to 1 while the power monitor is being reset to zero.
Bit 10	PME	Set to 1 while a measurement error is occurring in the power monitor.
Bit 11	LS	Set to 1 while the light source is ON.
Bit 12	PRT	Set to 1 while the printing is in progress.

5.5 Output Queue and Error Queue

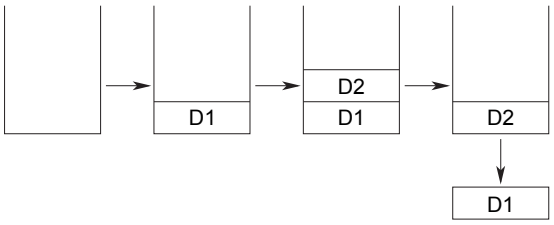
Overview of the Output Queue

The output queue is provided to store responsemessages 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 recordby record in the output queue, and is read out oldestitem first, newest item last.

The output queue is emptied in the following cases (in addition to whenread-out is performed).

•When a new message is received from thecontroller
•When dead lock occurs (page 4-2)
•When a device clear command (DCL or SDC) isreceived
•When power is turned ON again

The output queue cannot be emptied using the *CLS command. To see whether the output queue is emptyor 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 theprevious page).If the error queue becomes full, the final message willbe replaced by message “350, “Queue overflow”.”

The error queue is emptied in the following cases (inaddition 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, checkbit 2 (EAV) of the status byte.

5.6 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 personalcomputer.
- 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 735020-01E.*

Error in Execution

Code	Message
50	*OPC/? exists in message.
102	Syntax error.
103	Invalid separator.
104	Data type error.
108	Parameter not allowed.
109	Missing parameter.
111	Header separator error.
112	Program mnemonic too long.
113	Undefined header.
114	Header suffix out of range.
120	Numeric data error.
123	Exponent too large.
124	Too many digits.
128	Numeric data not allowed.
131	Invalid suffix.
134	Suffix too long.
138	Suffix not allowed.
141	Invalid character data.
144	Character data too long.
148	Character data not allowed.
150	String data error.
151	Invalid string data.
158	String data not allowed.
161	Invalid block data.
168	Block data not allowed.
171	Invalid expression.
178	Expression data not allowed.
181	Invalid outside macro definition.
210	Communication not allowed during trace analysis
211	Communication not allowed during measurement.
221	Setting conflict.
222	Data out of range.
223	Data invalid
224	Illegal parameter value.
241	Hardware missing.
260	Expression error.
270	Macro error.
272	Macro execution error.
273	Improper macro label.

Code	Message
275	Macro definition too long.
276	Macro recursion error.
277	Macro redefinition not allowed.
278	Macro header not found.
350	Queue overflow.
410	Query INTERRUPTED.
420	Query UNTERMINATED.
430	Query DEADLOCKED.
440	Query UNTERMINATED after indefinite response.

A List of Supported AQ7260 Commands

The AQ7270/AQ7275 commands that correspond to the commands used by the AQ7260 OTDR are indicated below.
A dash indicates that there is no corresponding command.
The commands are listed separately for control commands and request commands.
For details on the command functions, parameters, and return value format, see the *AQ7260 OTDR User's Manua l IM813920300-01E.*

Control Command

AQ7260 Command	AQ7270/AQ7275 Remote Command	Note
ST	:ACQuire:AVERage:STARt :ACQuire:AVERage:STOP :ACQuire:REALtime:STARt :ACQuire:REALtime:STOP	Divided into multiple commands by function.
CU	:ANALysis:CURSor:DISTance	
H	:ACQuire:OFFSet	
HSE	:DISPlay:DIVide:DISTance	
V	:DISPlay:DIVide:DECibel	
HPOS	:DISPlay:DISTance:LEFT	
VPOS	:DISPlay:DECibel:UPPer	
I	:DISPlay:ISCale	
CPY	-	No corresponding command.
FED	-	No corresponding command.
HSP	-	No corresponding command.
M	:ANALysis:FMARker:SET:M<x>	
Y	:ANALysis:FMARker:SET:Y<x>	
C	:ANALysis:FMARker:DELete	
CC	:ANALysis:CURSor:DELete	
REF	:ANALysis:REFerence:DISTance	
REC	:ANALysis:REFerence:DELete	
SF	:DISPlay:ALINe	
CL	:ANALysis:CURSor:LINK	
L	:LABel:LABel	
CORP	:LABel:COMPany	
OP	:LABel:OPERator	
LCID	:LABel:CABLe:ID	
LFID	:LABel:FIBer:ID	
FT	:LABel:FIBer:TYPE	
LCCD	:LABel:CABLe:CODE	
LOL	:LABel:LOCation:ORIGinating	
LTL	:LABel:LOCation:TERMinating	
LCDF	:LABel:DFLag:CURRent	
AI	-	No corresponding command.
LAM	:ACQuire:WAVelength	
FIL	-	No corresponding command.
LSA	:ANALysis:EMARker:LMTechnique :ANALysis:FMARker:LMTechnique	
PC	:ACQuire:PLUGcheck	
ASU	:ACQuire:AESearch	
R	:ACQuire:DRANge	
PW	:ACQuire:PWIDth	
AT	:ACQuire:ATTenuation	
AVD	:ACQuire:AVERage:TYPE	

AQ7260 Command	AQ7270/AQ7275 Remote Command	Note
NUM	:ACQuire:AVERage:INDex	
	:ACQuire:AVERage:TIME	
AVE	:ACQuire:AVERage:MODE	
DS	-	No corresponding command.
IOR	:ANALysis:IOR	
BS (RL)	:ANALysis:BCOefficient	
NWAVESET	-	No corresponding command.
MWAVE	-	No corresponding command.
ASAVE	:ACQuire:ADSave	
ASE	:ANALysis:ASEarch:EXECute	
NEX	:ANALysis:EVENt:CURRent:INDex	
PRE	:ANALysis:EVENt:CURRent:INDex	
IE	:ANALysis:EVENt:INSert	
DE	:ANALysis:EVENt:DELete	
EM	:ANALysis:EMARker:SET:M1	
	:ANALysis:EMARker:SET:M2	
	:ANALysis:EMARker:SET:M3	
EY	:ANALysis:EMARker:SET:Y2	
EN	:ANALysis:EVENt:CURRent:NOTE	
PL	-	No corresponding command.
SIORS	:ANALysis:EVENt:IOR	
SPL	:ANALysis:THReshold:SLOSs	
BSL (RSL)	:ANALysis:THReshold:RLOSs	
EFL (BPL)	:ANALysis:THReshold:EOFiber	
DFE	:ANALysis:FEDetection	
FESL	:ANALysis:THReshold:FESLoss	
FERL	:ANALysis:THReshold:FERLoss	
SSPOS	:ANALysis:SECTion:STARt	
SEPOS	:ANALysis:SECTion:END	
AJPOS	:ANALysis:SECTion:REFerence	
FDA	:FILE:DRIVe:SET	
DIR	:FILE:FOLDer:PATH	
FF	:FILE:TYPE	
FRC	:FILE:LOAD:EXECute	
FP	-	No corresponding command.
FST	:FILE:SAVe:EXECute	
RFS	-	No corresponding command.
DEL	:FILE:DELete:EXECute	
FIN	-	No corresponding command.
COPY	-	No corresponding command.
DRM	:FILE:FOLDer:MAKE	
DRD	:FILE:DELete:EXECute	
TRC	:DISPlay:WAVE:TYPE	
CSR	:DISPlay:CURSor:SECond	
	:DISPlay:CURSor:TYPE	
GD	:DISPlay:GTYPe	
DOT	-	No corresponding command.
DM	:ANALysis:DUNit	
DUO	-	No corresponding command.
FIG	:DISPlay:DIGit:DECibel	
DIS	:DISPlay:COLor	
DTE	:MISC:DATE:MODE	
YEA	:MISC:DATE:YEAR	
MTH	:MISC:DATE:MONTh	
DAY	:MISC:DATE:DAY	
HOU	:MISC:DATE:HOUR	
MIN	:MISC:DATE:MINute	

AQ7260 Command	AQ7270/AQ7275 Remote Command	Note
BEEP	:MISC:ARAMsound	
POW	:MISC:PSAVe	
BRI	:MISC:LCD:BRIGhtness	
PCME	-	No corresponding command.
PRD	-	No corresponding command.
PRIC	-	No corresponding command.
PRO	-	No corresponding command.
PRIM	-	No corresponding command.
FILESEND	:FILE:FILE:SEND	
SETINI	-	No corresponding command.
DCL	-	No corresponding command.
SRQ	-	No corresponding command.
OPMOD	:MENu:FUNCtion	
ILS	:LIGHtsource:ABORt	
	:LIGHtsource:EXECute	
ILM	:LIGHtsource:MODulation	
LSWL	:LIGHtsource:WAVelength	
FMODESET	-	No corresponding command.

Request Command

AQ7260 Command	AQ7270/AQ7275 Remote Command	Note
STR	-	
TIMR	:ACQuire:AVERage:COUNt?	
CUR	:ANALysis:CURSor:DISTance?	
HR	:ACQuire:OFFSet?	
HSER	:DISPlay:DIVide:DISTance?	
RESOR	-	
VR	:DISPlay:DIVide:DECibel?	
HPOSR	:DISPlay:DISTance:LEFT?	
DU	-	
VPOSR	:DISPlay:DECibel:UPPer?	
MD	-	
HSPR	-	
MR	:ANALysis:FMARker:SET:M<x>?	
YR	:ANALysis:FMARker:SET:Y<x>?	
REFR	-	
SFR	:DISPlay:ALINe?	
CLR	:ANALysis:CURSor:LINK?	
LR	:LABel:LABel?	
CORPR	:LABel:COMPany?	
OPR	:LABel:OPERator?	
LCIDR	:LABel:CABLe:ID?	
LFIDR	:LABel:FIBer:ID?	
FTR	:LABel:FIBer:TYPE?	
LCCDR	:LABel:CABLe:CODE?	
LOLR	:LABel:LOCation:ORIGinating?	
LTLR	:LABel:LOCation:TERMinating?	
LCDFR	:LABel:DFLag:CURRent?	
AIR	-	
LAMR	:ACQuire:WAVelength?	
FILR	-	
LSAR	:ANALysis:EMARker:LMTechnique?	
	:ANALysis:FMARker:LMTechnique?	
PCR	:ACQuire:PLUGcheck?	
ASUR	:ACQuire:AESearch?	
RR	:ACQuire:DRANge?	
PWR	:ACQuire:PWIDth?	
ATR	:ACQuire:ATTenuation?	
AVDR	:ACQuire:AVERage:TYPE?	
NUMR	:ACQuire:AVERage:INDex?	
	:ACQuire:AVERage:TIME?	
AVER	:ACQuire:AVERage:MODE?	
DSR	-	
IORR	:ANALysis:IOR?	
BSR (RLR)	:ANALysis:BCOefficient?	
U	-	
NWAVESET R	-	
MWAVE R	-	
ASAVER	:ACQuire:ADSave?	
EMR	:ANALysis:EMARker:SET:M1?	
	:ANALysis:EMARker:SET:M2?	
	:ANALysis:EMARker:SET:M3?	
EYR	:ANALysis:EMARker:SET:Y2?	

AQ7260 Command	AQ7270/AQ7275 Remote Command	Note
EDR	-	
ENR	:ANALysis:EVENt:CURRent:NOTE?	
SIORSR	:ANALysis:EVENt:IOR?	
SPLR	:ANALysis:THReshold:SLOSs?	
BSLR (RSLR)	:ANALysis:THReshold:RLOSs?	
EFLR (BPLR)	:ANALysis:THReshold:EOFiber?	
DFER	:ANALysis:FEDetection?	
FESLR	:ANALysis:THReshold:FESLoss?	
FERLR	:ANALysis:THReshold:FERLoss?	
SPPR	:ANALysis:ASEarch:NUMber?	
SPDR	-	
SSPOSR	-	
SEPOSR	-	
AJPOSR	-	
SDR	-	
FDAR	:FILE:DRIVe:SET?	
DIRR	:FILE:FOLDer:PATH?	
FFR	:FILE:TYPE?	
FSR	:FILE:DRIVe:FREE?	
FAR m,n,o	-	
SDIRR	:FILE:SUBFolder:LIST?	
CUDIR	:FILE:FOLDer:LIST?	
FERR	-	
TRCR	:DISPlay:WAVE:TYPE?	
CSRR	:DISPlay:CURSor:SECond?	
	:DISPlay:CURSor:TYPE?	
GDR	:DISPlay:GTYPe?	
DOTR	-	
DMR	:ANALysis:DUNit?	
DUOR	-	
FIGR	:DISPlay:DIGit:DECibel?	
DISR	:DISPlay:COLor?	
DTER	:MISC:DATE:MODE?	
YEAR	:MISC:DATE:YEAR?	
MTHR	:MISC:DATE:MONTh?	
DAYR	:MISC:DATE:DAY?	
HOUR	:MISC:DATE:HOUR?	
MINR	:MISC:DATE:MINute?	
BEEPR	:MISC:ARAMsound?	
POWR	:MISC:PSAVe?	
BRIR	:MISC:LCD:BRIGhtness?	
PRDR	-	
PRICR	-	
PROR	-	
PRSR (CPYR)	-	
RSR	-	
PRIMR	-	
DNR	:WAVedata:LENGth?	
DR	:WAVedata:SEND:ASCii?	
DABIR	:WAVedata:SEND:BINary?	
WR	:WAVedata:DISPlay:SEND:ASCii?	
WABIR	:WAVedata:DISPlay:SEND:BINary?	
FILESR	:FILE:FILE:NAME?	
	:FILE:FILE:SIZE?	

AQ7260 Command	AQ7270/AQ7275 Remote Command	Note
FILER	:FILE:FILE:GET?	
DBIR	:WAVedata:OLDType:SEND?	
WBIR	:WAVedata:OLDType:DISPlay:SEND?	
INFR	-	
IDER	-	
SRQR	-	
OPMODR	:MENU:FUNCtion?	
ILSR	-	
ILMR	:LIGHtsource:MODulation?	
LSWLR	:LIGHtsource:WAVelength?	
FMODESETR	-	