MT9085 Series
ACCESS Master
SCPI Remote Control
Operation Manual

Fourth Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided within the MT9085 Series ACCESS Master Operation Manual. Please also refer to it before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

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Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual

⚠ DANGER This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

⚠ WARNING This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

⚠ CAUTION This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

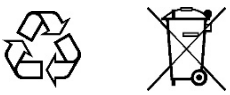
The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.

This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.

This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.

This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.

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Notes On Export Management

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About This Manual

The operation manuals for the MT9085 Series ACCESS Master consist of separate documents for the main unit, remote control, and quick guide. This operation manual describes the SCPI (Standard Commands for Programmable Instruments) commands for the MT9085A/B/C ACCESS Master (hereinafter ACCESS Master).

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Commands

Chapter 1 Overview

This chapter explains remote control of the ACCESS Master.

1.1 About Remote Control

The remote control function sends commands via the communications interface from the remote control PC (hereinafter PC) to set the measuring instrument and read the measurement results and measuring instrument conditions.

The ACCESS Master uses Ethernet or Wi-Fi as communication interface.

This document explains the commands that follow the format defined by SCPI (Standard Commands for Programmable Instruments).
The commands to control the ACCESS Master are called “control commands” and the commands to query data from the ACCESS Master are called “query commands”.
Commands are comprised of character strings. For example, the following command sets the measurement wavelength to 1550 nm:

```
SOURce:WAVelength 1550
```

A query command has the question symbol (?) appended to the string. For example, sending the following command queries the Distance Range set at the ACCESS Master.

```
SOURce:RANge?
```

The PC receives the following response from the ACCESS Master.

```
100
```

This response indicates that the Distance Range setting is 100 km.

When the ACCESS Master is in the remote control state, **Local Operation** is displayed on a softkey. During the remote control, all the keys except the power key and Local Operation cannot be used. To cancel remote control, touch **Local Operation**.

1.2 Applications

The main uses for remote control are listed below:

Automating Measurements

Instead of panel operations, measurement can be automated by controlling the ACCESS Master by executing programs.

Controlling Multiple Instruments

The characteristics of multiple DUT (device under test)s can be measured simultaneously by remote control of multiple instruments.

Remote Control of Instruments

Measuring instruments at remote locations can be controlled over communications lines to collect measurement data.

Chapter 2 Before Use

This chapter explains remote control of the ACCESS Master.

2.1 Preparing Equipment

The following equipment is required to perform remote control.

- PC
- USB network devices
- Ethernet cable
- Program development tools

PC

The PC must be Ethernet-equipped and able to run the program development tools.

USB network devices

Connect the following devices to the USB port of the ACCESS Master.

Device	Specification
USB-Ethernet converter	USB1.1/2.0, 10/100BASE-T
Wi-Fi dongle	USB1.1/2.0, IEEE 802.11b/g/n

Ethernet cable

Use a category-5 or better Ethernet cable.

Program Development Tools

Software to specify and transmit Ethernet address and port number.

2.2 Connecting Equipment

Connect the ACCESS Master to a network via the USB Ethernet converter or Wi-Fi dongle.

When connecting the USB Ethernet converter to the powered-on ACCESS Master:
This interrupts the measurement and displays the Ethernet Settings screen.

When connecting the USB Ethernet converter to the powered-off ACCESS Master:
Power on the ACCESS Master, and then touch **Remote Setup** in the Top Menu.

The settings of IP address, etc. are saved when the power is turned Off. The last settings are loaded when the power is turned On next time.

2.2.1 Connecting Ethernet Cable

Connect the Ethernet cable to the USB port (General) of the ACCESS Master, via the USB Ethernet converter.

Figure 2.2.1-1 Ethernet Cable Connection

To connect the ACCESS Master and PC directly, connect the LAN port of the USB Ethernet converter and that of PC using a cross cable. To connect multiple external devices, use a network hub and straight cables.

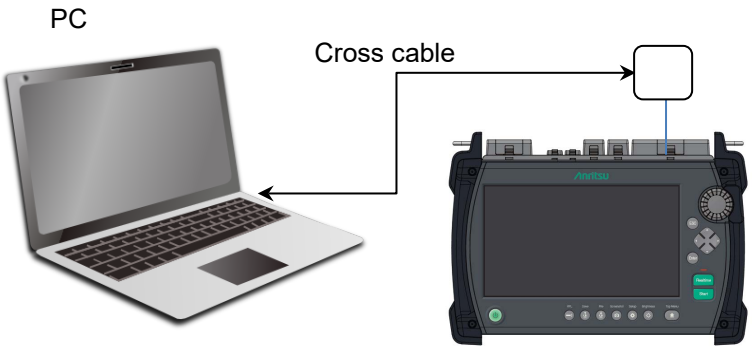


Figure 2.2.1-2 Connecting One PC

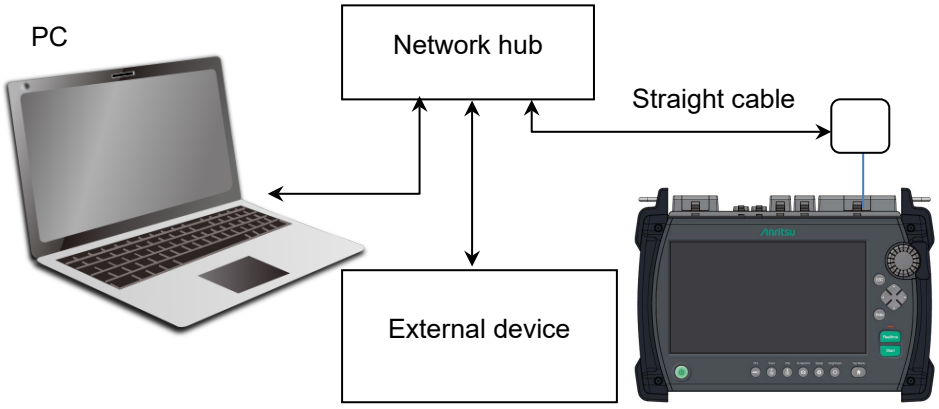


Figure 2.2.1-3 Connecting Multiple Pieces of External Equipment

Note:

Sometimes communications with the ACCESS Master are not established due to the external equipment communications status. For stable communications, connect the ACCESS Master and PC directly using a crossover cable.

2.2.2 Dongle Connection

Connect the Wi-Fi dongle to the USB port (General) of the ACCESS Master.

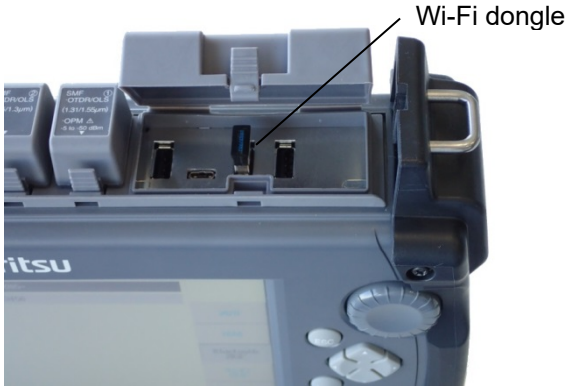


Figure 2.2.2-1 Dongle Connection

2.3 Setting Ethernet

Instrument settings such as IP address are set at the Remote Setup Screen.
After setting the IP Address of the ACCESS Master, also set the IP address of the PC according to 2.4 “Network Setup on PC”.

2.3.1 Ethernet Settings

1. In the Top Menu, touch **Remote Setup**.
2. Touch **Ethernet Settings**.

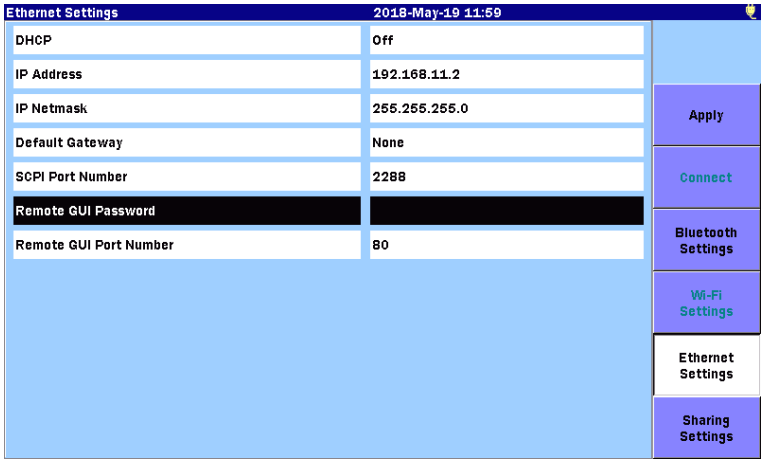


Figure 2.3.1-1 Ethernet Settings Screen

3. If you want to set IP address automatically, touch **DHCP** to turn it On. Then proceed to Step 8.
4. Touch **IP Address** and set IP address for the ACCESS Master. The input setting range is 0.0.0.1 to 255.255.255.254. The default setting is 192.168.1.2.
5. Touch **IP Netmask** and set IP netmask for the ACCESS Master.
   The input setting range is 0.0.0.0 to 255.255.255.255 and the default setting is 255.255.255.0.
6. Touch **Default Gateway** and set IP address for the default gateway.
   The input setting range is 0.0.0.1 to 255.255.255.254 and the default is None.
7. Touch **SCPI Port Number** and set a port number to be used

for SCPI command communication.
The input setting range is 1 to 65535 and the default is 2288.

8. When you finish editing the selected item, touch **Apply**.
9. Touch **Connect**.
10. Check that the following icon appears on the ACCESS Master screen. This means the ACCESS Master has successfully connected to the network.

    If DHCP is turned On in Step 3, IP Address and IP Netmask can be checked on the Ethernet Settings screen.

Figure 2.3.1-2 Network Connection Icon

2.3.2 Wi-Fi Settings

Follow the steps below to configure Wi-Fi settings.

1. In the Top Menu, touch **Remote Setup**.
2. Touch **Wi-Fi Settings**.
3. Touch **Selected Network**.

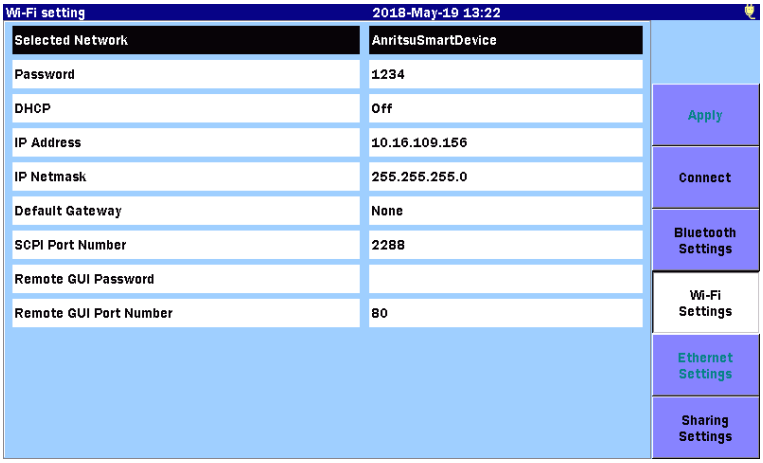


Figure 2.3.2-1 Wi-Fi Setting Screen

4. Touch **Refresh** to update the SSID display.
   If a network you want to connect to is not displayed, touch **Other** to add the SSID.

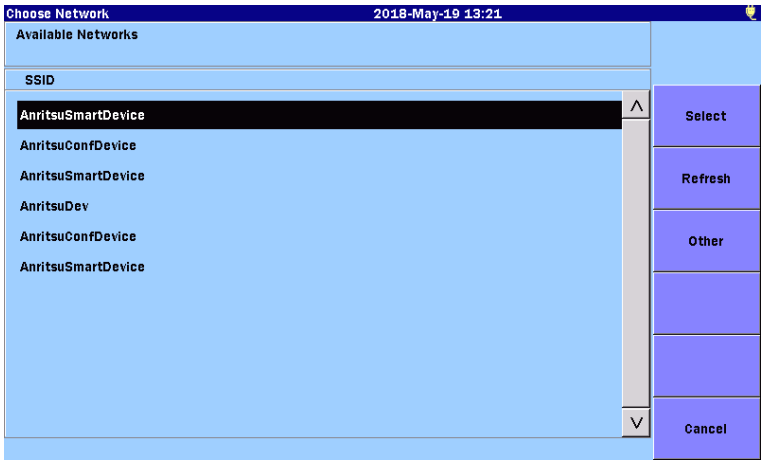


Figure 2.3.2-2 Choose Network Screen

5. In the SSID list, touch a network to connect, and then touch **Select**. The SSID of the selected network is displayed on the Wi-Fi Settings screen.
6. To set IP address automatically, touch DHCP to turn it On. Then proceed to Step 12.
7. Touch **IP Address** and set IP address for the ACCESS Master. The input setting range is 0.0.0.1 to 255.255.255.254. The default setting is 192.168.1.2.
8. Touch **IP Netmask** and set IP netmask for the ACCESS Master.
   The input setting range is 0.0.0.0 to 255.255.255.255 and the default setting is 255.255.255.0.

   Some combinations of numbers are invalid for IP netmask even if they are in the setting range.
9. Touch **Default Gateway** and set IP address for the default gateway.
   The input setting range is 0.0.0.1 to 255.255.255.254 and the default is None.
10. Touch **SCPI Port Number** and set a port number to be used for SCPI command communication.

The input setting range is 1 to 65535 and the default is 2288.

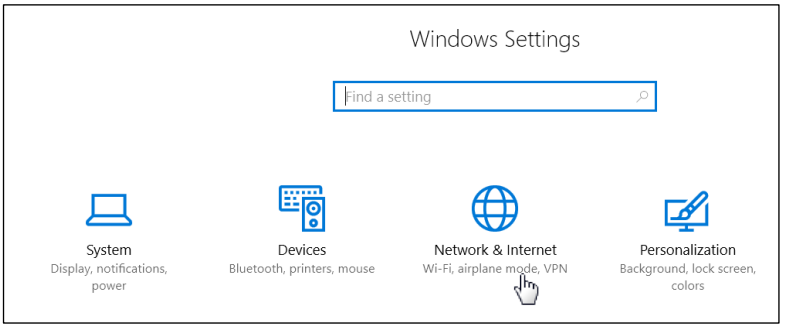
11. When you finish editing the selected item, touch **Apply**.
12. Touch **Connect**.
13. Check that the following icon appears on the ACCESS Master screen. This means the ACCESS Master has successfully connected to the network.

    If DHCP is turned On in Step 6, IP Address and IP Netmask can be checked on the Wi-Fi Settings screen.

2.4 Network Setup on PC

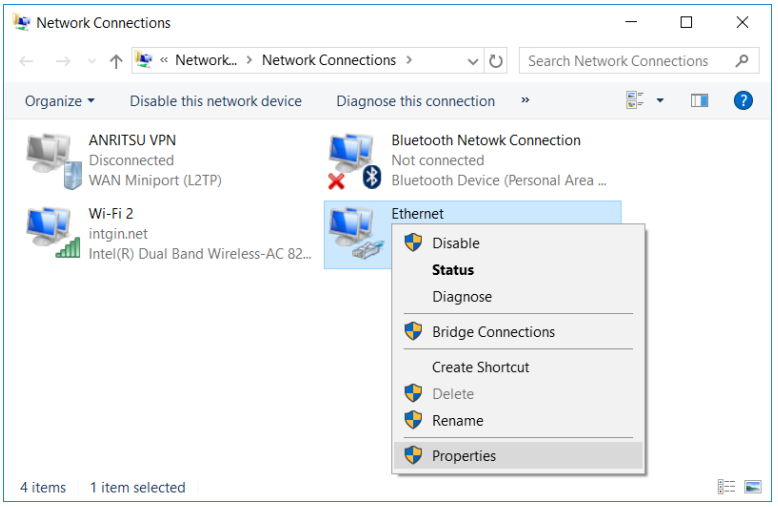
If it is necessary to set IP address, follow the setting procedure of the PC operating system. The example uses the Window 10 screens.

1. Go to **Start** , click **Settings**, and then click **Network & Internet**.



2. Click **Change adapter options**.

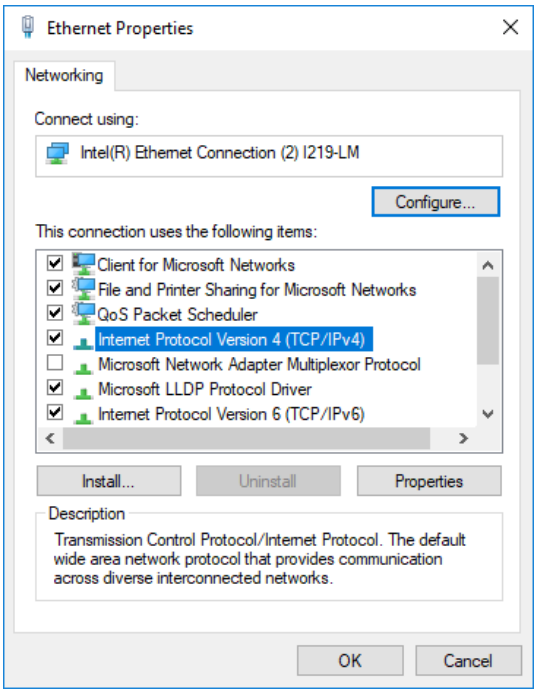
3. To use the USB Ethernet converter, right-click **Ethernet**, and then click **Properties**.



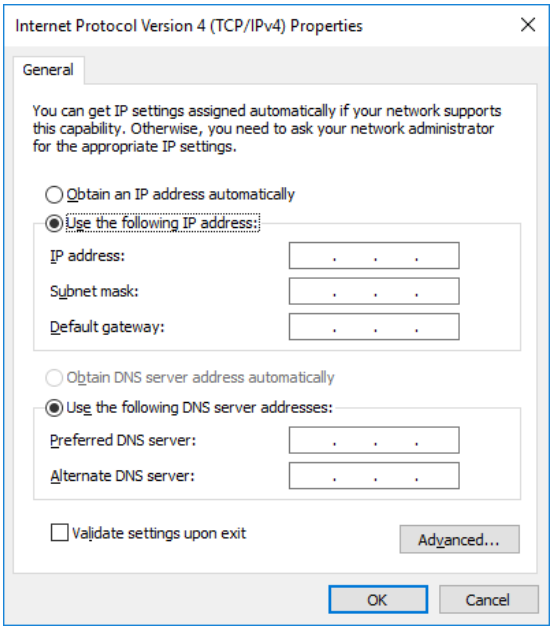
Note:

When using a Wi-Fi dongle, right-click **Wi-Fi.**

4. In the **Ethernet Properties** dialog box, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.



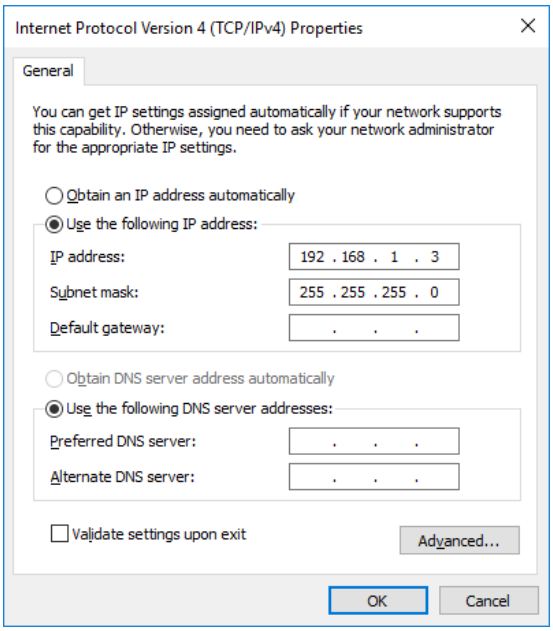
5. In the **Internet Protocol Version 4 (TCP/IPv4) Properties** dialog box, click **Use the following IP address**.



6. Assign an IP address that is different from the one set for the ACCESS Master. Here, configure as follows and click **OK**:

   IP address: 192.168.1.3

   Subnet mask: 255.255.255.0



7. In the **Ethernet Properties** dialog box, click **OK**.

2.5 Checking Connection

1. Click **Programs** at the Windows Start menu.
2. Click **Accessories**.
3. Click **Command Prompt**.
4. Input the commands shown in the screen below.
   This example shows how to set the IP address to 192.168.1.2.

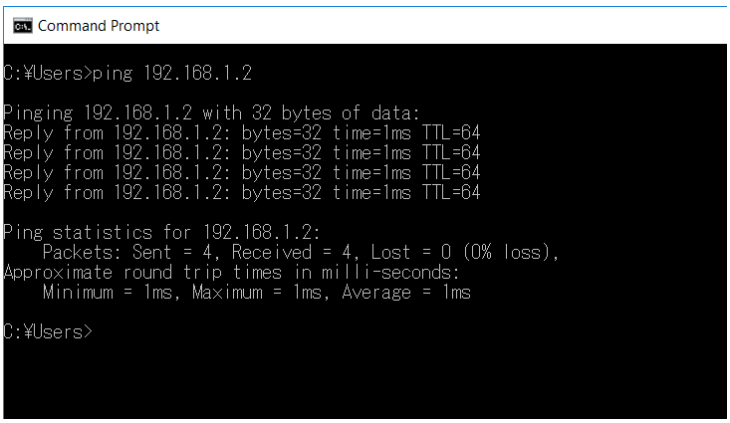


Figure 2.5-1 Executing Ping Command

5. Check that the “Request timed out” message is not displayed. Check that the following contents are correct.
   - IP address, IP Netmask, Default Gateway, SCPI Port Number
   - Cable connection
   - USB Ethernet converter connection
   - Wi-Fi dongle connection

2.6 Message Format

Messages are composed of character strings for executing commands and character strings indicating the message end. When sending messages to the ACCESS Master, terminate the line with CR/LF; received messages are terminated with CR/LF.

2.6.1 Message Formats

Messages are in the following formats, depending on the send direction.

Program Messages:

Messages sent from PC to the ACCESS Master.

Program messages are divided into the following two types.

- Command
  Used for setting measurement conditions or starting measurement, etc.
- Query
  Used for querying the state or setup of the ACCESS Master. If a query is sent, the ACCESS Master creates a response message.

These messages are composed of header and data parts separated by a white space. Program messages must have an appended header but may not include data.

Response Messages:

Messages sent from the ACCESS Master to PC.

Response messages must have appended data but may not include a header.

2.6.2 Header Composition

The header is composed of alphanumeric characters and underbars while the first character is an alphabetic character. However, common commands defined by IEEE 488.2 have an asterisk (*) appended to the head of the string. The program is not case-sensitive.

Command with only header:

```
*RST
*CLS
```

```
INITiate:AUTo
```

Command with header and data:

```
*ESE 255
SOURce:WAVelength 1310
INSTrument:SELect OTDR_STD
```

Messages with multiple data use commas (,) to separate the data parts.

Example:

```
SENSe:LSALeft 0.0,10.0
SENS:ANAL:PAR 0.05,-60.0,3.0
```

Queries have a question mark (?) appended to the header.

Example:

```
*ESR?
TOPMenu:UNIT:CATalog?
SOUR:PULS:ENH?
```

When linking multiple program messages, separate the message using semicolons (;). The maximum number of linked messages is 12. If 13 or more messages are sent, the 13th and subsequent messages are discarded.

Example:

```
SOUR:WAV 1310;SOUR:RAN 100;SOUR:RES 0;INIT;*WAI
```

2.6.3 Data Formats

The data format is character string data, numeric data, and binary data.

Character String Data

This is a string of ASCII code.

The following example shows a program message for switching to the OTDR (Standard) mode from the Top Menu.

Example:

```
INSTrument:SELect OTDR_STD
```

Numeric Data

This is described in binary numerals.

Example:

```
SYSTem:LOCK 1
TOPM:UNIT 2
SENSe:LOSS:MODE 5
SENSe:FIB:IOR 1.500000
SENSe:VOFF -10.0
```

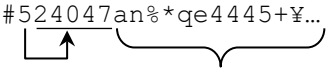
When using binary numbers, input numeric values either as integers or floating point representation.

Binary Data

The head string starts with a number sign (#) and continues with data after a numeric value indicating the data length.

The character after the number sign (#) indicates the number of digits in the data.
The binary data follows the number indicating the data length.
Example:

```
#524047an%*qe4445+¥...
```



5 digits 24047 bytes of binary data

2.7 Checking Instrument Status

The ACCESS Master has registers indicating the status, such as errors and command execution status. This section explains these registers.

2.7.1 Register Structure

Figure 2.7.1-1 shows the structure of the registers indicating the ACCESS Master status.

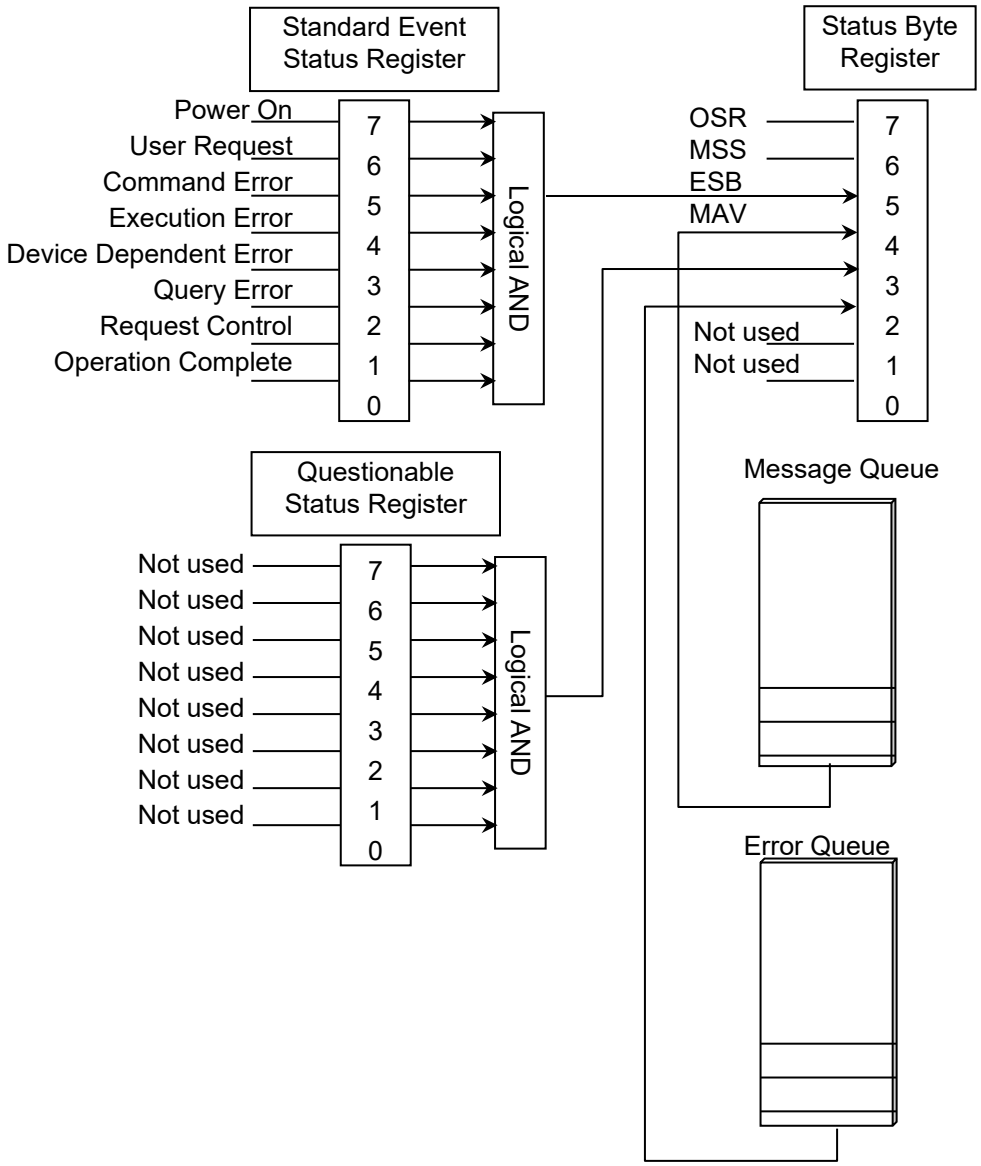


Figure 2.7.1-1 Register Structure

Each register uses 8-bit data. The register output values are the binary totals for each bit shown in Figure 2.7.1-1.

Table 2.7.1-1 Register Bit Binary Conversion Values

Bit	Binary value	Bit	Binary value
0	1	4	16
1	2	5	32
2	4	6	64
3	8	7	128

To output the status byte register data, set the bit corresponding to the service request enable register to 1. To read the status byte register, set the service request enable register. The logical product of these two registers is read by `*STB`.

Each standard event register has a corresponding enable register. The logical product of the event and enable registers is obtained and the logical sum of this result is output at bit 5 of the status byte register.

Questionable Status Register

This register is reserved for future use. It is not used.

Message Queue

The message queue is always empty, so the response message from the ACCESS Master can be sent immediately.
Up to 12 messages from the PC can be spooled.

Error Queue

Up to 12 error messages from the ACCESS Master can be spooled.

2.7.2 Status Byte Register

The meaning of each bit of the status byte register is shown in the following table.

Table 2.7.2-1 Meaning of Status Byte Register

Bit	Explanation
7	OSR (Operation Status Register) Displays the ACCESS Master's operation status. Currently only 1 can be set during OTDR measurement. This is the logical sum of each bit of the logical product of the operation event register and status operation enable register.
6	MSS (Master Summary Register) This indicates whether the value read from the status byte register is 0 or not. It is the logical sum of bit 7 and bit 5 to 0 of the logical product of the status byte register and the service request enable register.
5	ESB (Event Status Bit) This is the logical sum of each bit of the logical product of the standard event status register and standard event enable register.
4	MAV (Message AVailable summary) This is always 0 in the ACCESS Master, because messages are not spooled and are sent immediately.
3	Questionable Status Register Not used; always 0
2	Error / Event Queue This is 1 when there is an error message in the Error queue.
1	Not used; always 0
0	Not used; always 0

Bit 7 to bit 0 of the status byte register can be read with `*STB`.

The `*SRE` and `*SRE?` common commands can be used for setting and reading the service request enable register for setting reading of the status byte register. To output the status byte register data, set the bit corresponding to the service request enable register to 1.

Bits 5, 3, and 2 of the status byte register can be set to 0 using the *CLS common command.
When *CLS is sent after a command or when a query is sent after *CLS, the send queue is cleared and bit 4 is set to 0.

The service request enable register cannot be set to 0 using *CLS, so use *SRE.

2.7.3 Event Register

The meaning of each bit of the standard event status register is listed in the table below.

Table 2.7.3-1 Meaning of Standard Event Status Register

Bit	Explanation
7	Power-on Becomes 1 at power-on and 0 each time 1 is read.
6	User Request Not used; always 0
5	Command Error Becomes 1 when received undefined program message, message that cannot executed according to syntax, or message with spelling error.
4	Execution Error Becomes 1 when received program message that cannot be executed because parameter specification is out of range.
3	Device Dependent Error Becomes 1 at errors other than command, execution and query errors.
2	Query Error Becomes 1 when no data to read in output queue or output queue data fails for some reason.
1	Request Control Not used; always 0
0	Operation Complete Indicates whether or not device completely ended operations in event table. This command responds only to the *OPC command.

Bit 7 to bit 0 of the standard event status register can be read by

the *ESR? command. The standard event status register returns to 0 when read.

The standard event Status enable register can be set and read using the *ESE and *ESE? commands. To output standard event register data, set the bit corresponding to the enable register to 1.

Bit 0 can be read using the *OPC common command.

The standard register can be set to 0 using the *CLS command.

2.8 Controlling Message Sync

The following messages (12 types max.) can be received during measurement by the ACCESS Master and analysis of measurement results. However, if a message is sent to change the measurement parameters before the previous processing is completed, the message is discarded and the correct measurement conditions will not be set.

The following program message changes the wavelength to 1550 nm while performing averaging measurements at a wavelength of 1310 nm.

```
SOUR:WAV 1310;INIT;SOUR:WAV 1550
```

Figure 2.8-1 shows the message execution sequence when this message is sent to the ACCESS Master. After setting the initial wavelength, sweeping starts when INIT is sent. Although a command to change the wavelength to 1550 nm is sent during sweeping, the command is ignored during measurement.

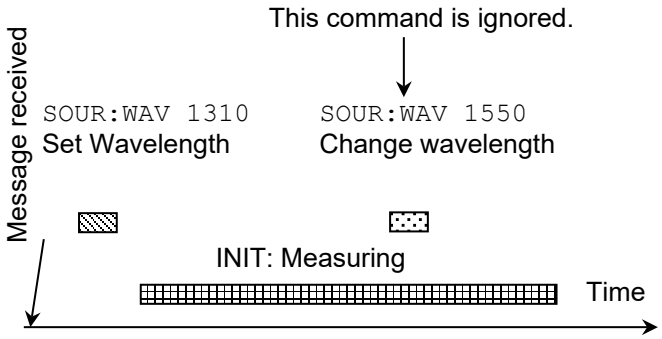


Figure 2.8-1 Message Execution Sequence

The control for processing the next command after completing processing of the message sent first is called sync control.

Sync control is performed by the following methods.

- Using `*WAI` command
- Using `*OPC?` query
- Using `*OPC` command and `*ESR?` query
- By querying execution end

The *WAI command, *OPC? query, *OPC command and *ESR? query can be used for all messages.

Using *WAI

The *WAI common command instructs processing to wait until processing of the message sent before the *WAI command is completed before executing the next command.

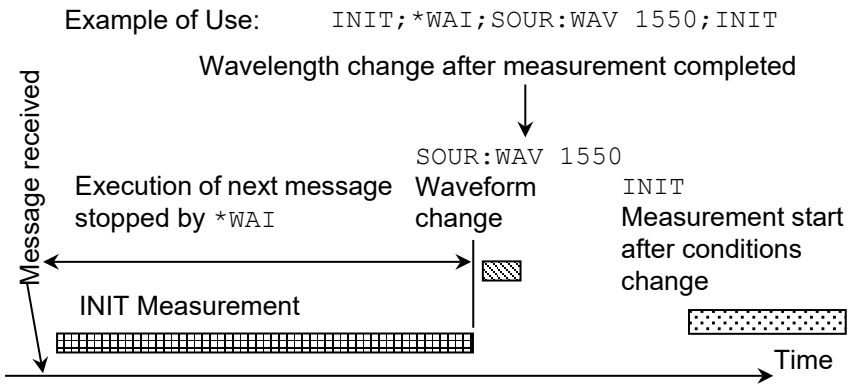


Figure 2.8-2 Sync Control using *WAI

Using *OPC?

The *OPC? common command queries the OPC bit indicating the end of message processing.

Examples of Use:

INIT	Executes averaging measurement
*OPC?	Queries if operation is completed and waits until "1" returns.
> 1	Measuring stopped when response is 1.
SENS:TRAC:READY?	Queries presence/absence of measured waveform data.
> 1	Waveform data is ready when response is 1.
TRAC:LOAD:SOR?	Gets trace object from ACCESS Master.
SOUR:WAV 1550	Changes wavelength
INIT	Starts measurement with new measurement conditions.

Using *OPC and *ESR?

The *OPC common command sets bit 0 (OPC bit) of the standard event status register to 1 when the message processing is

completed.

Examples of Use:

`*CLS`	Sets the OPC bit to 0.
`*ESE 1`	Sets standard event status register to 1.
`INIT`	Executes averaging measurement.
`*OPC`	Sets so as to change standard event status register OPC bit (bit 0) to 1 after measurement completed.
`*ESR?`	Standard Event Status register query
`> 0`	Measuring when response is 0
`*ESR?`	Standard Event Status register query
`> 1`	Measuring stopped when response is 1.
`SENS:TRAC:READY?`	Queries presence/absence of measured waveform data.
`> 1`	Waveform data is ready when response is 1.
`TRAC:LOAD:SOR?`	Gets trace object from ACCESS Master.
`SOUR:WAV 1550`	Changes wavelength.
`INIT`	Starts measurement with new measurement conditions.

2.9 Switching SM Port and MM Port

Two ports for single mode fiber (measurement wavelength: 1310/1550 nm) and multimode fiber (measurement wavelength: 850/1300 nm) are installed in ACCESS Master with option 063.

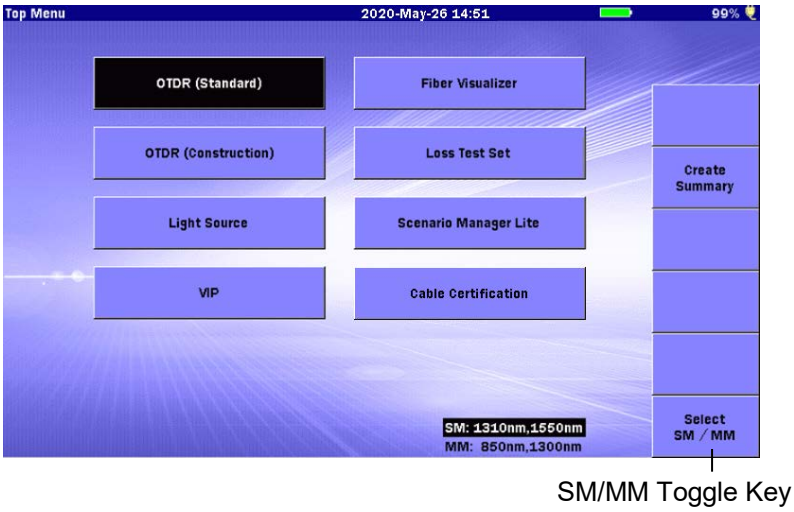


Figure 2.9-1 Top Menu

Switch between the SM and MM as described below.

Example of Use 1: with MT9085B-063 (MM 850/1300 nm, SM 1310/1550 nm)

`TOPMenu:UNIT:CATalog:FULL?`	Queries installed port.
`>MM,1,SM,2`	At MM, 1, SM, 2 response: Multimode port installed as port 1 and single mode port installed as port 2.
`TOPMenu:UNIT:NSELect?`	Queries current measurement port.
`>1`	At 1 response: Multimode port selected.
`TOPM:UNIT:NSEL 2`	Switches to single mode port.

Example of Use 2: with MT9085B-063 (MM 850/1300 nm, SM 1310/1550 nm)

`TOPMenu:UNIT:CATalog?`	Queries installed port.
`>MM,SM`	At MM, SM response: Multimode port and single mode port installed.
`TOPMenu:UNIT?`	Queries current measurement port.
`>MM`	At MM response: Multimode port selected.
`TOPM:UNIT:SEL SM`	Switches to single mode port.

2.10 Moving to Another Measurement Mode from Top Menu

In addition to OTDR measurement, the ACCESS Master has other built-in measurement mode functions such as Light Source and Power Meter. To use these measurements, it is necessary to switch measurement mode.
The remote control modes supported by the current ACCESS Master are Top Menu and OTDR (Standard).
This example explains how to switch the OTDR (Standard) mode to the measurement mode from the Top Menu.
Switching between the Top Menu and OTDR (Standard) mode requires the following:

Example of Use 1: To perform measurement at 1310 nm with MT9085C-053

`INSTrument:CATalog:FULL?`	Queries measurement mode supporting remote
`>TOP_MENU,1,OTDR_STD,2`	At TOP_MENU, 1, OTDR_STD, 2: Supports selection of Mode 1 at Top Menu and Mode 2 at OTDR (Standard).
`INSTrument:NSELect?`	Queries current mode.
`>1`	At 1 response: Top Menu
`INST:NSEL 2`	Switches to OTDR (Standard). Note: Measurement mode inactive
`INST:STAT 1`	Enables OTDR (Standard) mode.
`SOUR:WAV 1310`	Sets wavelength to 1310 nm.

Example of Use 2: To measure with MM unit after measuring with SM unit using MT9085B-063 (MM 850/1300 nm, SM 1310/1550 nm)

`INSTrument:NSELect?`	Queries current measurement mode.
`>2`	At 2 response: OTDR (Standard) mode
`INST:NSEL 1`	Moves to Top Menu.
`TOPMenu:UNIT:CATalog:FULL?`	Queries installed OTDR.
`>MM,1,SM,2`	At MM, 1, SM, 2 response: Multimode port installed as port 1 and single mode port installed as port 2.
`TOPM:UNIT:NSEL 1`	Switches to multimode port.

Chapter 3 Platform SCPI Commands

This chapter details the SCPI commands for the ACCESS Master platform.
In the syntax description, <wsp> represents a space.

3.1 IEEE 488.2 Common Commands

*CLS

Function

The Clear Status command *CLS clears all the event registers summarized in the Status Byte register.
Except for the output queue, all queues summarized in the Status Byte register are emptied. The error queue is also emptied.
Neither the Standard Event Status Enable register, nor the Service Request Enable register are affected by this command.

Syntax

```
*CLS
```

Parameters

None

Response Data

None

Example of Use

```
*CLS
```

*ESE

Function

The standard Event Status Enable command (*ESE) sets bits in the Standard Event Status Enable register.
A 1 in a bit in the enable register enables the corresponding bit in the Standard Event Status register.
The register is cleared at power-on. The *RST and *CLS commands do not affect the register.

Syntax

```
*ESE<wsp><value>
```

Parameters

The bit value for the register (a **short** value):

7: (MSB) Power On	128
6: User Request	64
5: Command Error	32

4: Execution Error	16
3: Device Dependent Error	8
2: Query Error	4
1: Request Control	2
0: (LSB) Operation Complete	1

Response Data

None

Example of Use

```
*ESE 21
```

*ESE?

Function

The standard Event Status Enable query *ESE? returns the contents of the Standard Event Status Enable register (see **ESE for information on this register).

Syntax

```
*ESE?
```

Parameters

None

Response Data

The bit value for the register (a **short** value).

Example of Use

```
*ESE?
> 21<END>
```

*ESR?

Function

The standard Event Status Register query *ESR? returns the contents of the Standard Event Status register.
The register is cleared after being read.

Syntax

```
*ESR?
```

Parameters

None

Response Data

The bit value for the register (a **short** value):

7: (MSB) Power On	128
6: User Request	64
5: Command Error	32
4: Execution Error	16
3: Device Dependent Error	8
2: Query Error	4
1: Request Control	2
0: (LSB) Operation Complete	1

Example of Use

```
*ESR?
> 22<END>
```

*IDN?

Function

The Identification query *IDN? gets the instrument identification over the interface.

Syntax

```
*IDN?
```

Parameters

None

Response Data

The identification string terminated by <END>.

Example of Use

```
*IDN?
> ANRITSU,MT9085C,6260123456<END>
```

*OPC

Function

A device is in the Operation Complete Command Active State (OCAS) after it has executed *OPC.

The device returns to the Operation Complete Command Idle State (OCIS) whenever the No Operation Pending flag is TRUE, and at the same time the OPC bit of the SESR is set to “1”.
The following events force the device into OCIS. In these cases, the No Operation Pending flag is FALSE and the OPC bit of the SESR is not set to “1”:
. Power-on
. *CLS
. *RST

Syntax

```
*OPC
```

Parameters

None

Response Data

None

Example of Use

```
*OPC
```

*OPC?

Function

A device is in the Operation Complete Query Active State (OQAS) after it has executed *OPC?.
The device returns to the Operation Complete Query Idle State (OQIS) whenever the No Operation Pending flag is TRUE, at the same time placing a “1" in the Output Queue.
The following actions cancel the *OPC? query (and put the instrument into Operation Complete, Command Idle State):
. Power-on

Syntax

```
*OPC?
```

Parameters

None

Response Data

1 <END>.

Example of Use

```
*OPC?
> 1<END>
```

*RST

Function

The ReSeT command *RST sets the ACCESS Master to Top Menu. Pending *OPC actions are cancelled. The ACCESS Master is placed in the idle state awaiting a command. The *RST command clears the error queue.

The following are not changed:

. Output queue

. Service Request Enable register (SRE)

. Standard Event Status Enable register (ESE)

Syntax

```
*RST
```

Parameters

None

Response Data

None

Example of Use

```
*RST
```

*SRE

Function

The standard Service Request Enable command (*SRE) sets bits in the Service Request Enable register.

A 1 in a bit in the enable register enables the corresponding bit in the Service Request Enable register.

The register is cleared at power-on. The *RST and *CLS commands do not affect the register.

Syntax

```
*SRE<wsp><value>
```

Parameters

The bit value for the register (a **short** value):

7: Operation Status Summary	128
6: Master Summary Status (MSS) / Request Service (RQS)	64
5: Standard Event Status Summary (ESB)	32
4: Message Available (MAV)	16
3: Questionable Status Summary	8
2: Error/Event Queue Summary	4
1: Available	2
0: Available	1

Response Data

None

Example of Use

```
*SRE 64
```

*SRE?

Function

The Service Request Enable query *SRE? returns the contents of the Service Request Enable register (see *SRE for information on this register).

Syntax

```
*SRE?
```

Parameters

None

Response Data

The bit value for the register (a **short** value):

7: Operation Status Summary	128
6: Master Summary Status (MSS) / Request Service (RQS)	64
5: Standard Event Status Summary (ESB)	32
4: Message Available (MAV)	16
3: Questionable Status Summary	8
2: Error/Event Queue Summary	4

1: Available 2
0: Available 1

Example of Use

```
*SRE?
> 21<END>
```

*STB?

Function

The Status Byte query *STB? returns the contents of the Status Byte register.
The Master Summary Status (MSS) bit is true when any enabled bit of the STB register is set (excluding Bit 6).
The Status Byte register including, the master summary bit, MSS, is not directly altered because of an *STB? query.

Syntax

```
*STB?
```

Parameters

None

Response Data

The bit value for the register (a **short** value):

7: Operation Status Summary 128
6: Master Summary Status (MSS) / Request Service (RQS) 64
5: Standard Event Status Summary (ESB) 32
4: Message Available (MAV) 16
3: Questionable Status Summary 8
2: Error/Event Queue Summary 4
1: Available 2
0: Available 1

Example of Use

```
*STB?
> 78<END>
```

*TST?

Function

This query is not used with the ACCESS Master now.

The self-test query *TST? makes the currently selected logical instrument to perform a self-test and place the results of the test in the output queue.
No further commands are allowed while the test is running.
After the self test the instrument is returned to the setting that was active at the time the self-test query was processed.

Syntax

```
*TST?
```

Parameters

None

Response Data

The sum of the results for the individual tests (a 32-bit signed integer value)

Example of Use

```
*TST?
> 0<END>
```

*WAI

Function

The Wait command *WAI prevents the instrument from executing any further commands until the current command has finished executing.
All pending operations are completed during the wait period.

Syntax

```
*WAI
```

Parameters

None

Response Data

None

Example of Use

```
*WAI
```

3.2 System Commands

SYSTem:ERRor?

Function

Queries the contents of the SCPI error queue.
Removes the returned entry from the queue.

Syntax

```
SYSTem:ERRor?
```

Parameters

None

Response Data

The number of the latest error, sorted by the error commands sending order, and its meaning.

Example of Use

```
SYST:ERR?
> -100,"std_command,Command Parse Error"<END>
```

SYSTem:VERSion?

Function

Queries the SCPI revision to which the system complies.

Syntax

```
SYSTem:VERSion?
```

Parameters

None

Response Data

The revision year and number string.

Example of Use

```
SYST:VERS?
> 1990.0<END>
```

SYSTem:LIGHt?

Function

Queries if the backlight is turned ON or OFF.

Syntax

```
SYSTem:LIGHt?
```

Parameters

None

Response Data

Possible responses are:

0: The backlight is OFF.

1: The backlight is ON.

Example of Use

```
SYST:LIGH?
> 0<END>
```

SYSTem:LIGHt

Function

Sets the backlight on the system ON or OFF.

Syntax

```
SYSTem:LIGHt<wsp><value>
```

Parameters

<value>

Boolean format

Range: 0 | 1

0: Turn the backlight OFF on the unit.

1: Turn the backlight ON on the unit.

Response Data

None

Example of Use

```
SYST:LIGH 1<END>
```

3.3 Status Subsystem Commands

STATus:OPERation[:EVENt]?

Function

Queries the operation event register.

Syntax

```
STATus:OPERation[:EVENt]?
```

Parameters

None

Response Data

The bit value for the operation event register as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER?
> 0<END>
```

STATus:OPERation:CONDition?

Function

Queries the operation condition register.

Syntax

```
STATus:OPERation:CONDition?
```

Parameters

None

Response Data

The bit value for the operation condition register as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER:COND?
> 16<END>
```

STATus:OPERation:BIT<n>:CONDition?

Function

This command accesses the user-definable bits in the OPERation register set. The value of <n> is restricted from 8 to 12 and represents bits 8 through 12 in the operation status register.

Syntax

```
STATus:OPERation:BIT<n>:CONDition?
```

Parameters

None

Response Data

The bit value for the operation condition register as a **short** value (0 .. 1)

Example of Use

```
STAT:OPER:BIT8:COND?
> 1<END>
```

STATus:OPERation:BIT<n>:ENABle

Function

Sets the operation enable mask for the event register specified bit. The value of <n> is restricted from 8 to 12 and represents bits 8 through 12.

Syntax

```
STATus:OPERation:BIT<n>:ENABle<wsp><value>
```

Parameters

The bit value for the operation enable mask as a **short** value (0 .. 1)

Response Data

None

Example of Use

```
STAT:OPER:BIT11:ENAB 1
```

STATus:OPERation:BIT<n>:ENABle?

Function

Queries the operation enable mask for the event register specified bit.

The value of <n> is restricted from 8 to 12 and represents bits 8 through 12 in the operation status register.

Syntax

```
STATus:OPERation:BIT<n>:ENABle?
```

Parameters

None

Response Data

The bit value for the operation enable mask as a **short** value (0 .. 1)

Example of Use

```
STAT:OPER:BIT9:ENAB?
> 0<END>
```

STATus:OPERation:BIT<n>[:EVENt]?

Function

Queries the operation event register specified bit.

The value of <n> is restricted from 8 to 12 and represents bits 8 through 12 in the operation status register.

Syntax

```
STATus:OPERation:BIT<n>[:EVENt]?
```

Parameters

None

Response Data

The bit value for the operation event register as a **short** value (0 .. 1)

Example of Use

```
STAT:OPER:BIT10:EVEN?
> 0<END>
```

STATus:OPERation:ENABle

Function

Sets the operation enable mask register for the event register.

Syntax

```
STATus:OPERation:ENABle<wsp><value>
```

Parameters

The bit value for the operation enable mask as a **short** value (0 .. +32767)

Response Data

None

Example of Use

```
STAT:OPER:ENAB 128
```

STATus:OPERation:ENABle?

Function

Queries the operation enable mask register for the event register.

Syntax

```
STATus:OPERation:ENABle?
```

Parameters

None

Response Data

The bit value for the operation enable mask as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER:ENAB?
> 128<END>
```

STATus:OPERation:INSTrument:CONDition?

Function

Queries the instrument operation condition register.

Syntax

```
STATus:OPERation:INSTrument:CONDition?
```

Parameters

None

Response Data

The bit value for the operation condition register as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER:INST:COND?
> 16<END>
```

STATus:OPERation:INSTrument:ENABle

Function

Sets the instrument operation enable mask for the event register.

Syntax

```
STATus:OPERation:INSTrument:ENABle<wsp><value>
```

Parameters

The bit value for the operation enable mask as a **short** value (0 .. +32767)

Response Data

None

Example of Use

```
STAT:OPER:INST:ENAB 128
```

STATus:OPERation:INSTrument:ENABle?

Function

Queries the instrument operation enable mask for the event register.

Syntax

```
STATus:OPERation:INSTrument:ENABle?
```

Parameters

None

Response Data

The bit value for the operation enable mask as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER:INST:ENAB?
> 128<END>
```

STATus:OPERation:INSTrument[:EVENt]?

Function

Queries the instrument operation event register.

Syntax

```
STATus:OPERation:INSTrument[:EVENt]?
```

Parameters

None

Response Data

The bit value for the operation event register as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER:INST?
> 0<END>
```

STATus:OPERation:INSTrument:ISUMmary<n>:CONDition?

Function

Queries the instrument operation condition register of the specified instrument.
The value of <n> is restricted from 1 to 14 and represents the logical instruments id assigned to the SCPI controlled instrument by the INSTrument subsystem.

Syntax

```
STATus:OPERation:INSTrument:ISUMmary<n>:CONDition?
```

Parameters

None

Response Data

The bit value for the operation condition register as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER:INST:ISUM4:COND?
> 16<END>
```

STATus:OPERation:INSTrument:ISUMmary<n>:ENABle

Function

Sets the instrument operation enable mask for the event register of the specified instrument. The value of <n> is restricted from 1 to 14 and represents the logical instruments id assigned to the SCPI controlled instrument by the INSTrument subsystem.

Syntax

```
STATus:OPERation:INSTrument:ISUMmary<n>:ENABle<wsp
><value>
```

Parameters

The bit value for the operation enable mask as a **short** value (0 .. +32767)

Response Data

None

Example of Use

```
STAT:OPER:INST:ISUM1:ENAB 128
```

STATus:OPERation:INSTrument:ISUMmary<n>:ENABle?

Function

Queries the instrument operation enable mask for the event register of the specified instrument. The value of <n> is restricted from 1 to 14 and represents the logical instruments id assigned to the SCPI controlled instrument by the INSTrument subsystem.

Syntax

```
STATus:OPERation:INSTrument:ISUMmary<n>ENABle?
```

Parameters

None

Response Data

The bit value for the operation enable mask as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER:INST:ISUM4:ENAB?
> 128<END>
```

STATus:OPERation:INSTrument:ISUMmary<n>[:EVENt]?

Function

Queries the instrument operation event register of the specified instrument. The value of <n> is restricted from 1 to 14 and represents the logical instruments id assigned to the SCPI controlled instrument by the INSTrument subsystem.

Syntax

```
STATus:OPERation:INSTrument:ISUMmary<n>[:EVENt]?
```

Parameters

None

Response Data

The bit value for the operation event register as a **short** value (0 .. +32767)

Example of Use

```
STAT:OPER:INST:ISUM3?
> 0<END>
```

STATus:QUEStionable[:EVENt]?

Function

Queries the questionable event register.

Syntax

```
STATus:QUEStionable[:EVENt]?
```

Parameters

None

Response Data

The bit value for the questionable event register as a **short** value (0 .. +32767)

Example of Use

```
STAT:QUES?
> 0<END>
```

STATus:QUEStionable:CONDition?

Function

Queries the questionable condition register.

Syntax

```
STATus:QUEStionable:CONDition?
```

Parameters

None

Response Data

The bit value for the questionable condition register as a **short** value (0 .. +32767)

Example of Use

```
STAT:QUES:COND?
> 8<END>
```

STATus:QUEStionable:BIT<n>:CONDition?

Function

Queries the questionable condition register specified bit.
The value of <n> is restricted from 9 to 12 and represents bits 9 through 12 in the operation status register.

Syntax

```
STATus:QUEStionable:BIT<n>:CONDition?
```

Parameters

None

Response Data

The bit value for the questionable condition register as a **short** value (0 .. 1)

Example of Use

```
STAT:QUES:BIT9:COND?
> 0<END>
```

STATus:QUEStionable:BIT<n>:ENABle

Function

Sets the questionable enable mask for the event register specified bit.

The value of <n> is restricted from 9 to 12 and represents bits 9 through 12 in the questionable status register.

Syntax

```
STATus:QUEStionable:BIT<n>:ENABle<wsp><value>
```

Parameters

The bit value for the questionable enable mask as a **short** value (0 .. 1)

Response Data

None

Example of Use

```
STAT:QUES:BIT11:ENAB 1
```

STATus:QUEStionable:BIT<n>:ENABle?

Function

Queries the questionable enable mask for the event register specified bit.

The value of <n> is restricted from 9 to 12 and represents bits 9 through 12 in the questionable status register.

Syntax

```
STATus:QUEStionable:BIT<n>:ENABle?
```

Parameters

None

Response Data

The bit value for the questionable enable mask as a **short** value (0 .. 1)

Example of Use

```
STAT:QUES:BIT10:ENAB?
> 1<END>
```

STATus:QUEStionable:BIT<n>[:EVENt]?

Function

Queries the questionable event register specified bit.
The value of <n> is restricted from 9 to 12 and represents bits 9 through 12 in the questionable status register.

Syntax

```
STATus:QUEStionable:BIT<n>[:EVENt]?
```

Parameters

None

Response Data

The bit value for the questionable event register as a **short** value (0 .. 1)

Example of Use

```
STAT:QUES:BIT9:EVEN?
> 0<END>
```

STATus:QUEStionable:ENABle

Function

Sets the questionable enable mask for the event register.

Syntax

```
STATus:QUEStionable:ENABle<wsp><value>
```

Parameters

The bit value for the questionable enable mask as a **short** value (0 .. +32767)

Response Data

None

Example of Use

```
STAT:QUES:ENAB 128
```

STATus:QUEStionable:ENABle?

Function

Queries the questionable enable mask for the event register.

Syntax

```
STATus:QUEStionable:ENABle?
```

Parameters

None

Response Data

The bit value for the questionable enable mask as a **short** value (0 .. +32767)

Example of Use

```
STAT:QUES:ENAB?
> 128<END>
```

STATus:QUEStionable:INSTrument:CONDition?

Function

Queries the questionable instrument condition register.

Syntax

```
STATus:QUEStionable:INSTrument:CONDition?
```

Parameters

None

Response Data

The bit value for the questionable condition register as a **short**

value (0 .. +32767)

Example of Use

```
STAT:QUES:INST:COND?
> 8<END>
```

STATus:QUEStionable:INSTrument:ENABle

Function

Sets the questionable instrument enable mask for the event register.

Syntax

```
STATus:QUEStionable:INSTrument:ENABle<wsp><value>
```

Parameters

The bit value for the questionable enable mask as a **short** value (0 .. +32767)

Response Data

None

Example of Use

```
STAT:QUES:INST:ENAB 128
```

STATus:QUEStionable:INSTrument:ENABle?

Function

Queries the questionable instrument enable mask for the event register.

Syntax

```
STATus:QUEStionable:INSTrument:ENABle?
```

Parameters

None

Response Data

The bit value for the questionable enable mask as a **short** value (0 .. +32767)

Example of Use

```
STAT:QUES:INST:ENAB?
> 128<END>
```

STATus:QUEStionable:INSTrument[:EVENt]?

Function

Queries the questionable instrument event register.

Syntax

```
STATus:QUEStionable:INSTrument[:EVENt]?
```

Parameters

None

Response Data

The bit value for the questionable event register as a **short** value (0 .. +32767)

Example of Use

```
STAT:QUES:INST:EVEN?
> 0<END>
```

STATus:QUEStionable:INSTrument:ISUMmary<n>:CONDition?

Function

Queries the specified logical instrument questionable instrument condition register.

The value of <n> is restricted from 1 to 14 and represents the logical instruments id assigned to the SCPI controlled instrument by the INSTrument subsystem.

Syntax

```
STATus:QUEStionable:INSTrument:ISUMmary<n>:CONDiti
on?
```

Parameters

None

Response Data

The bit value for the questionable condition register as a **short** value (0 .. +32767)

Example of Use

```
STAT:QUES:INST:ISUM2:COND?
> 0<END>
```

STATus:QUEStionable:INSTrument:ISUMmary<n>:ENABle

Function

Sets the questionable instrument enable mask for the event register of the specified logical instrument.
The value of <n> is restricted from 1 to 14 and represents the logical instruments id assigned to the SCPI controlled instrument by the INSTrument subsystem.

Syntax

```
STATus:QUEStionable:INSTrument:ISUMmary<n>:ENABle<wsp><value>
```

Parameters

The bit value for the questionable enable mask as a **short** value (0 .. +32767)

Response Data

None

Example of Use

```
STAT:QUES:INST:ISUM3:ENAB 128
```

STATus:QUEStionable:INSTrument:ISUMmary<n>:ENABle?

Function

Queries the questionable instrument enable mask for the event register of the specified logical instrument.
The value of <n> is restricted from 1 to 14 and represents the logical instruments id assigned to the SCPI controlled instrument by the INSTrument subsystem.

Syntax

```
STATus:QUEStionable:INSTrument:ISUMmary<n>:ENABle?
```

Parameters

None

Response Data

The bit value for the questionable enable mask as a **short** value (0 .. +32767)

Example of Use

```
STAT:QUES:INST:ISUM3:ENAB?
> 136<END>
```

STATus:QUEStionable:INSTrument:ISUMmary<n>[:EVENt]?

Function

Queries the questionable instrument event register of the specified logical instrument.
The value of <n> is restricted from 1 to 14 and represents the logical instruments id assigned to the SCPI controlled instrument by the INSTrument subsystem.

Syntax

```
STATus:QUEStionable:INSTrument:ISUMmary<n>[:EVENt]
?
```

Parameters

None

Response Data

The bit value for the questionable event register as a **short** value (0 .. +32767)

Example of Use

```
STAT:QUES:INST:ISUM4:EVEN?
> 0<END>
```

STATus:PRESet

Function

Resets both the operation event mask and questionable event mask to 0.

Syntax

```
STATus:PRESet
```

Parameters

None

Response Data

None

Example of Use

```
STAT:PRES
```

3.4 Instrument Subsystem Commands

INSTrument:CATalog?

Function

Queries the list of instruments on the ACCESS Master that are identified as SCPI controllable instruments.

Syntax

```
INSTrument:CATalog?
```

Parameters

None

Response Data

Comma-separated list of string identifiers of all SCPI controllable logical instruments

TOP_MENU	Top Menu
OTDR_STD	OTDR (Standard)

Example of Use

```
INST:CAT?
> TOP_MENU,OTDR_STD<END>
```

INSTrument:CATalog:FULL?

Function

Queries the list of instruments on the ACCESS Master that are identified as SCPI controllable instruments.

Syntax

```
INSTrument:CATalog:FULL?
```

Parameters

None

Response Data

Comma-separated list of string identifiers and numbers of all SCPI controllable logical instruments.
The string contains the name identifier of the logical instrument. The immediately following short value is an associated logical instrument number of the port. All response data elements are

comma separated.

Example of Use

```
INSTrument:CATalog:FULL?
> TOP_MENU,1,OTDR_STD,2<END>
```

INSTrument:NSELect

Function

Sets a numeric value identifier for the logical instrument specified as control target.

Syntax

```
INSTrument:NSELect<wsp><num_id>
```

Parameters

Numeric value identifier for the logical instrument specified as control target (a short value)

Response Data

None

Example of Use

```
INST:NSEL 2
```

INSTrument:NSELect?

Function

Queries the numeric value identifier of the logical instrument specified as control target.

Syntax

```
INSTrument:NSELect?
```

Parameters

None

Response Data

Numeric value identifier for the logical instrument specified as control target (a short value)

Example of Use

```
INST:NSEL?
> 2<END>
```

INSTrument[:SELect]

Function

Selects the specified logical instrument as control target.

Syntax

```
INSTrument:SELect<wsp><string_id>
```

Parameters

String instrument identifier assigned by the Instrument subsystem for selecting the instrument

Response Data

None

Example of Use

```
INST:SEL OTDR_STD
```

INSTrument[:SELect]?

Function

Queries the string value identifier of the currently selected logical instrument.

Syntax

```
INSTrument:SELect?
```

Parameters

None

Response Data

String value identifier of the currently selected logical instrument.

Example of Use

```
INST:SEL?
> OTDR_STD<END>
```

INSTrument:STATe

Function

Turns the currently selected logical instrument state ON or OFF.

Syntax

`INSTrument:STATe<wsp><boolean>`

Parameters

Boolean format

On: 1 or ON

Off: 0 or OFF

Response Data

None

Example of Use

```
INST:STAT ON
```

INSTrument:STATe?

Function

Queries the state of the currently selected logical instrument.

Syntax

`INSTrument:STATe?`

Parameters

None

Response Data

State of logical instrument

Boolean format

1: On

0: Off

Example of Use

```
INST:STAT?
> 1<END>
```

3.5 TOPMenu Subsystem Commands

TOPMenu:UNIT:CATalog?

Function

Queries a list of ports installed on the ACCESS Master.

Syntax

```
TOPMenu:UNIT:CATalog?
```

Parameters

None

Response Data

Comma-separated list of string identifiers of all installed Ports

Example of Use

```
TOPM:UNIT:CAT?
> MM,SM<END>
```

TOPMenu:UNIT:CATalog:FULL?

Function

Queries a list of ports installed on the ACCESS Master.

Syntax

```
TOPMenu:UNIT:CATalog:FULL?
```

Parameters

None

Response Data

List of string identifiers and numbers of ports
The string contains the name identifier of the installed Ports. The immediately following NR1-formatted number is its associated logical port number. All response data elements are comma separated.

Example of Use

```
TOPM:UNIT:CAT:FULL?
> MM,1,SM,2<END>
```

TOPMenu:UNIT[:SELect]

Function

Sets the specified Port to be currently selected Port.

Syntax

```
TOPMenu:UNIT:SELect<wsp><string_id>
```

Parameters

The string instrument identifier assigned by the TOPMenu subsystem for the Port to be selected as a **string** value

Response Data

None

Example of Use

```
TOPM:UNIT:SEL SM
```

TOPMenu:UNIT[:SELect]?

Function

Queries the string value identifier of the currently selected Port.

Syntax

```
TOPMenu:UNIT:SELect?
```

Parameters

None

Response Data

String value identifier of the currently selected port.

Example of Use

```
TOPM:UNIT:SEL?
> MM<END>
```

TOPMenu:UNIT:NSELect

Function

Sets the specified Port to be currently selected to run with OTDR instrument.

Syntax

```
TOPMenu:NSELect<wsp><num_id>
```

Parameters

The numeric value identifier assigned by the TOPMenu subsystem for the Port to be selected as a **short** value

Response Data

None

Example of Use

```
TOPM:UNIT:NSEL 2
```

TOPMenu:UNIT:NSELect?

Function

Queries the numeric value identifier of the currently selected Port.

Syntax

```
TOPMenu:UNIT:NSELect?
```

Parameters

None

Response Data

Numeric value identifier of the currently selected port.

Example of Use

```
TOPM:UNIT:NSEL?
> 1<END>
```

Chapter 4 OTDR Commands

This chapter details the SCPI commands for the ACCESS Master Standard OTDR application. The Command Summary section presents a brief summary of each command, while each command is detailed in the subsequent sections.
In the syntax description, <wsp> represents a space.

4.1 Command Summary

The Command Summary section provides a list of the SCPI commands for the ACCESS Master Standard OTDR application, and a brief description for each command.

Commands and queries in this section can be received only in the OTDR (Standard) mode.

4.1.1 Root level commands

ABORt	Aborts active test, data is lost.
STOP	Stops the test, keeps the trace on screen.
INITiate	Start test with manual test settings.
INITiate:AUTo	Start auto-test.
INITiate:RTIMe	Start real time test with manual settings.
INITiate?	Queries if test is active.

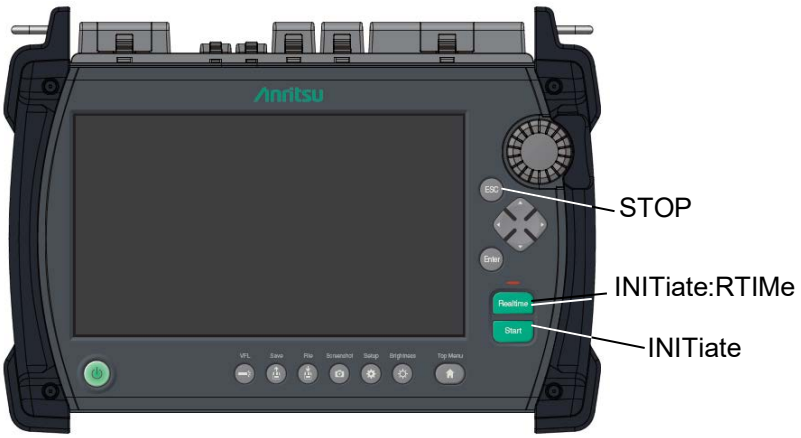


Figure 4.1.1-1 Commands Related to Measurements

4.1.2 Source Subsystem Commands

SOURce:WAVelength:AVAilable?	Queries available wavelength list.
SOURce:WAVelength	Sets current selected wavelength.
SOURce:WAVelength?	Queries current selected wavelength.
SOURce:RANge:AVAilable?	Queries available ranges list.
SOURce:RANge	Sets current selected range.
SOURce:RANge?	Queries current selected range.
SOURce:RESo:AVAilable?	Queries available resolutions list.
SOURce:RESo	Sets current selected resolution.
SOURce:RESo?	Queries current selected resolution.
SOURce:PULSe:AVAilable?	Queries available pulse width list.
SOURce:PULSe	Sets current selected pulse width.
SOURce:PULSe?	Queries current selected pulse width.
SOURce:PULSe:ENHanced:AVAilable?	Queries if Enhanced Range is available for the dead zone when using the selected pulse width.
SOURce:PULSe:ENHanced	Sets Enhanced Range for the dead zone.
SOURce:PULSe:ENHanced?	Queries if Enhanced Range is set for the dead zone.
SOURce:AVERages:TIMe	Sets averaging time for the next test.
SOURce:AVERages:TIMe?	Queries averaging time for the next test.
SOURce:AVERages:COUNt	Sets the averaging count.
SOURce:AVERages:COUNt?	Queries the averaging count.
SOURce:AVERages:EXPonent	Sets the averaging count in exponential form with base 2.
SOURce:AVERages:EXPonent?	Queries the averaging count in exponential form with base 2.

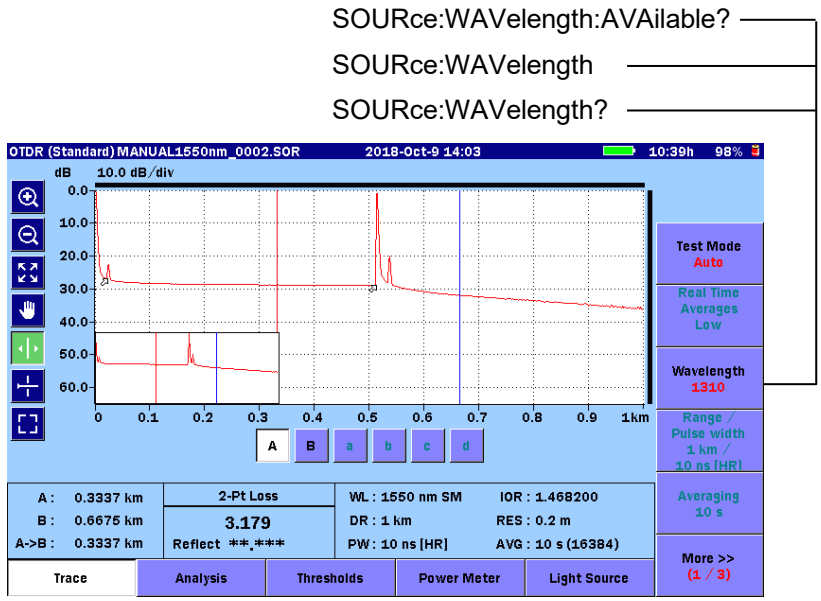


Figure 4.1.2-1 Commands Related to Wavelength

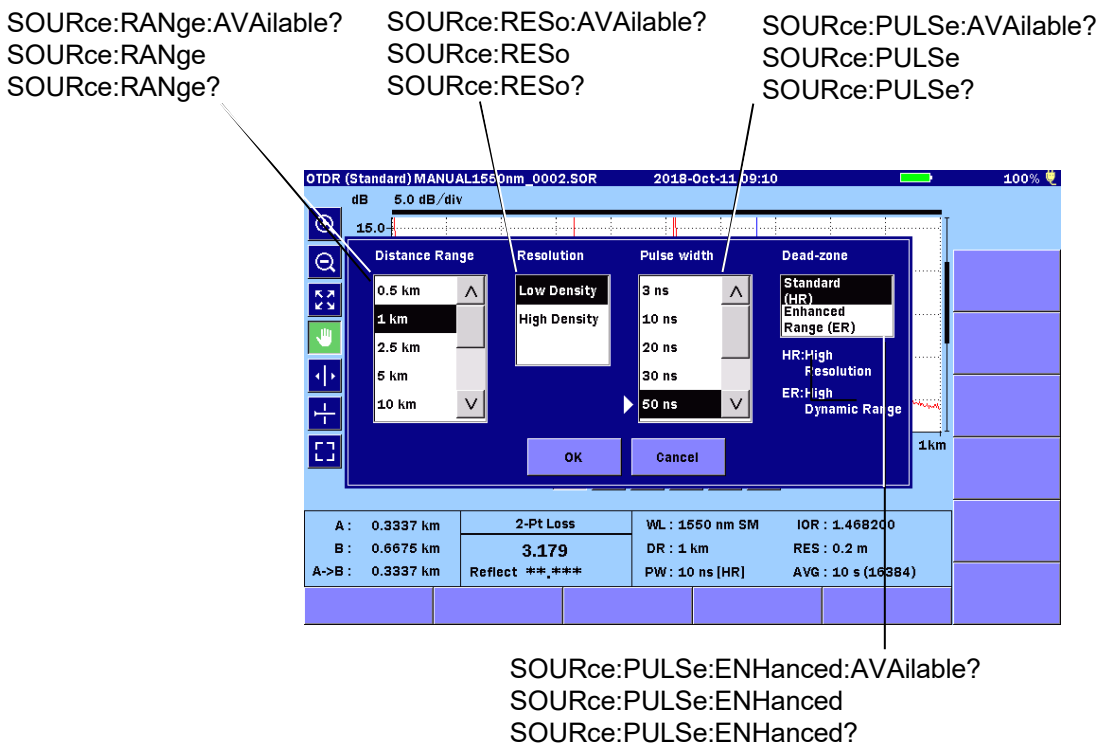


Figure 4.1.2-2 Commands Related to Measurement Condition

SOURce:AVERages:TIMe
SOURce:AVERages:TIMe?
SOURce:AVERages:COUNt
SOURce:AVERages:COUNt?
SOURce:AVERages:EXPonent
SOURce:AVERages:EXPonent?

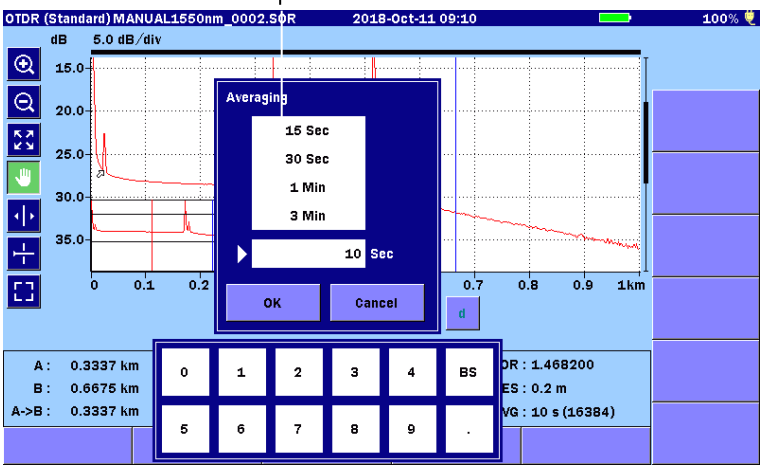


Figure 4.1.2-3 Commands Related to Average Time

4.1.3 Sense Subsystem Commands

SENSe:AVERages?	Queries averages count since test started.
SENSe:AVERages:TIMe?	Queries averaging time since test started.
SENSe:TRACe:READY?	Queries if the trace data is ready.
SENSe:CONCheck	Sets connection check option ON or OFF.
SENSe:CONCheck?	Queries if the connection check option enabled.
SENSe:LIVCheck	Sets live fiber check option ON or OFF.
SENSe:LIVCheck?	Queries if the live fiber check option enabled.
SENSe:FIBCheck	Sets fiber length check option ON or OFF.
SENSe:FIBCheck?	Queries if the fiber length check option enabled.
SENSe:FIBer:IOR	Sets fiber IOR value.
SENSe:FIBer:IOR?	Queries fiber IOR value.
SENSe:FIBer:BSC	Sets fiber BSC value.
SENSe:FIBer:BSC?	Queries fiber BSC value.
SENSe:HOFFset	Sets horizontal offset value.
SENSe:HOFFset?	Queries horizontal offset value.
SENSe:VOFFset	Sets vertical offset value.
SENSe:VOFFset?	Queries vertical offset value.
SENSe:LSALeft	Sets left LSA maker position values.
SENSe:LSALeft?	Queries left LSA maker position values.
SENSe:LSARight	Sets right LSA maker position values.
SENSe:LSARight?	Queries right LSA maker values.
SENSe:ACURsor	Sets A cursor position.
SENSe:ACURsor?	Queries A cursor position value.
SENSe:BCURsor	Sets B cursor position.
SENSe:BCURsor?	Queries B cursor position value.
SENSe:LOSS:MODE	Sets current loss mode.
SENSe:LOSS:MODE?	Queries currently selected loss mode.
SENSe:ORL:MODE	Sets current ORL Mode.
SENSe:ORL:MODE?	Queries current ORL Mode.
SENSe:ANALyze:PARameters	Sets auto detection parameters values.
SENSe:ANALyze:PARameters?	Queries auto detection parameters values.
SENSe:ANALyze:PARameters:ENDRefl	Sets auto detection parameters values.
SENSe:ANALyze:PARameters:ENDRefl?	Queries auto detection parameters values.
SENSe:ANALyze:AUTO	Sets trace auto analysis option ON/OFF.
SENSe:ANALyze:AUTO?	Queries if the trace auto analysis option is on.

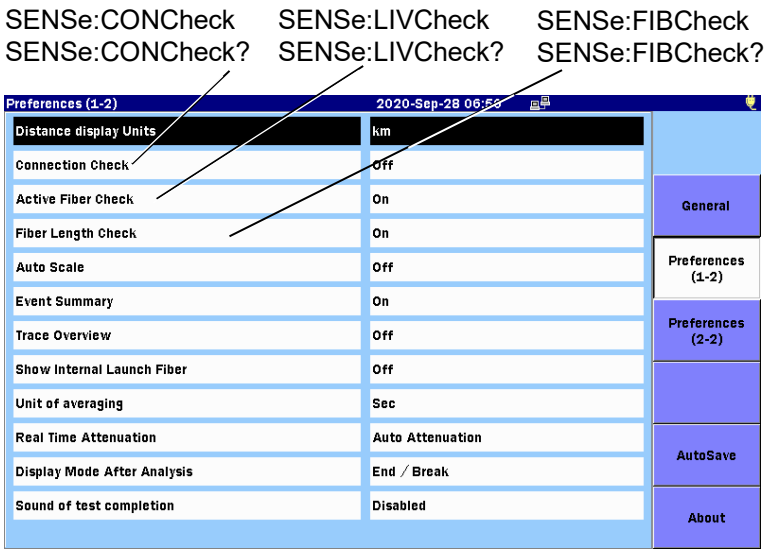


Figure 4.1.3-1 Commands for Preferences (1-2)

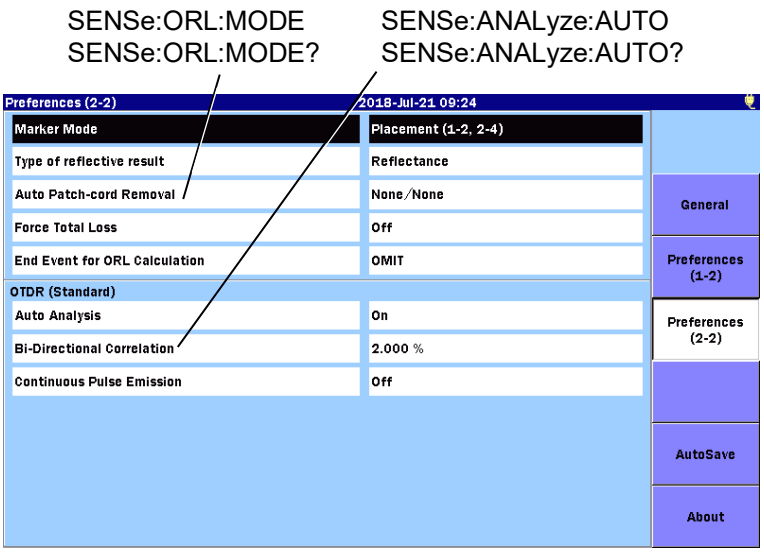


Figure 4.1.3-2 Commands for Preferences (2-2)

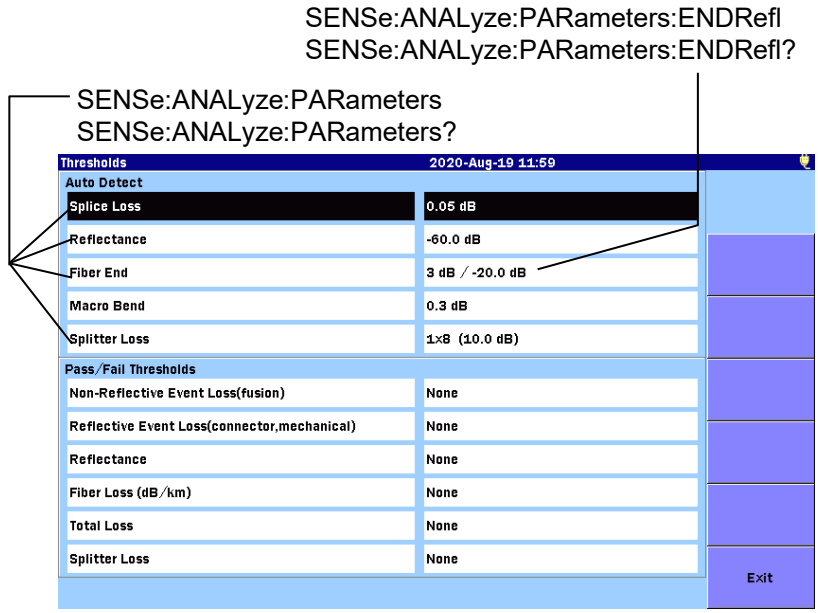


Figure 4.1.3-3 Commands for Thresholds

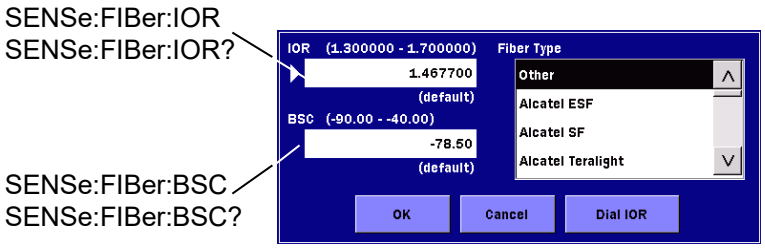


Figure 4.1.3-4 Commands for IOR and BSC

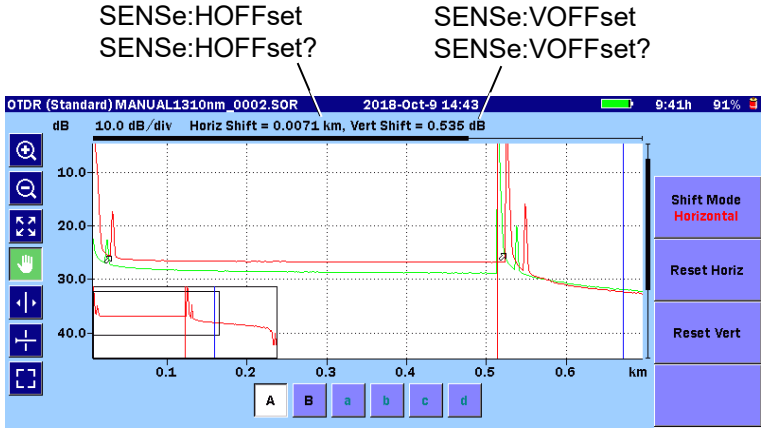


Figure 4.1.3-5 Commands for Offset

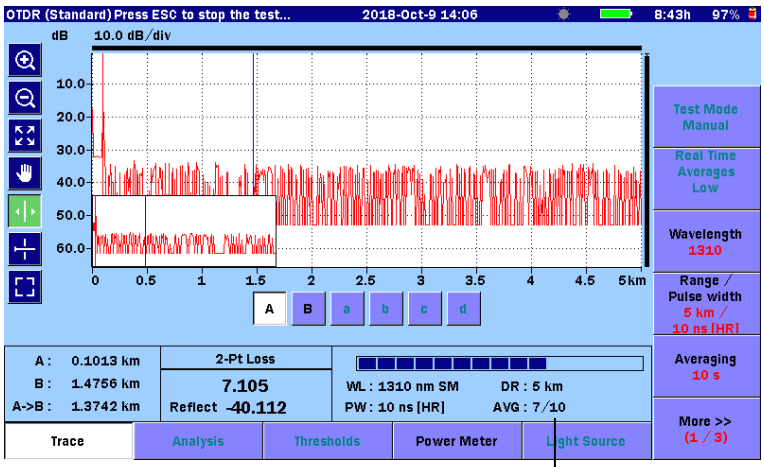


Figure 4.1.3-6 Commands for Averaging

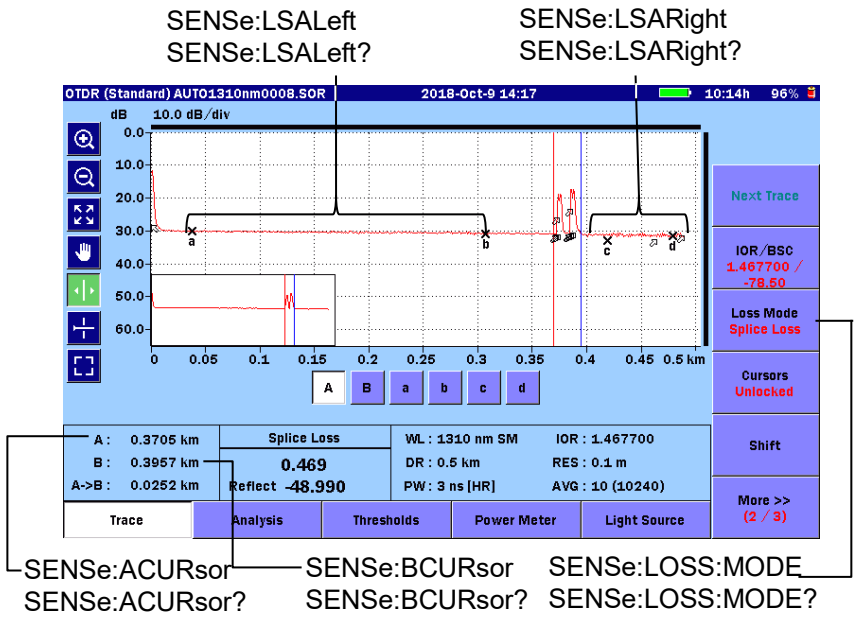


Figure 4.1.3-7 Commands for Cursors

4.1.4 Trace Subsystem Commands

TRACe:PARameters?	Queries trace parameters summary in text format.
TRACe:ANALyze	Performs analysis on the trace.
TRACe:ANALyze?	Queries if the trace is analyzed.
TRACe:ANALyze:ORL	Performs ORL calculations on the trace.
TRACe:MDLOss?	Queries trace loss value for current loss mode.
TRACe:EELOss?	Queries trace end-to-end loss value.
TRACe:LOAD:SOR?	Queries trace data in SOR file format.
TRACe:LOAD:TEXT?	Queries trace data in ASCII text format.
TRACe:LOAD:DATA?	Queries trace data points in binary format.
TRACe:HEADer	Sets Trace Header.
TRACe:HEADer?	Queries Trace Header.
TRACe:STORe:SOR	Stores the SOR file in internal memory of the ACCESS Master.

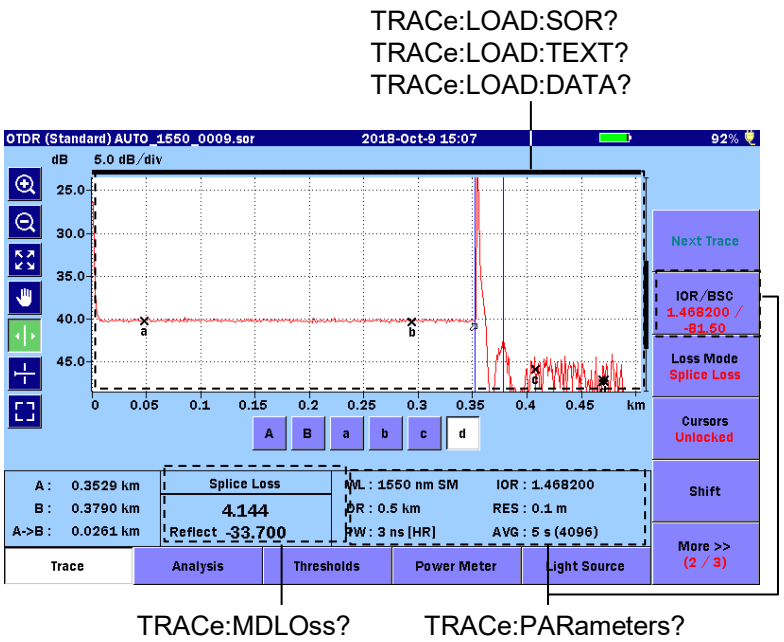


Figure 4.1.4-1 Commands for Trace Data

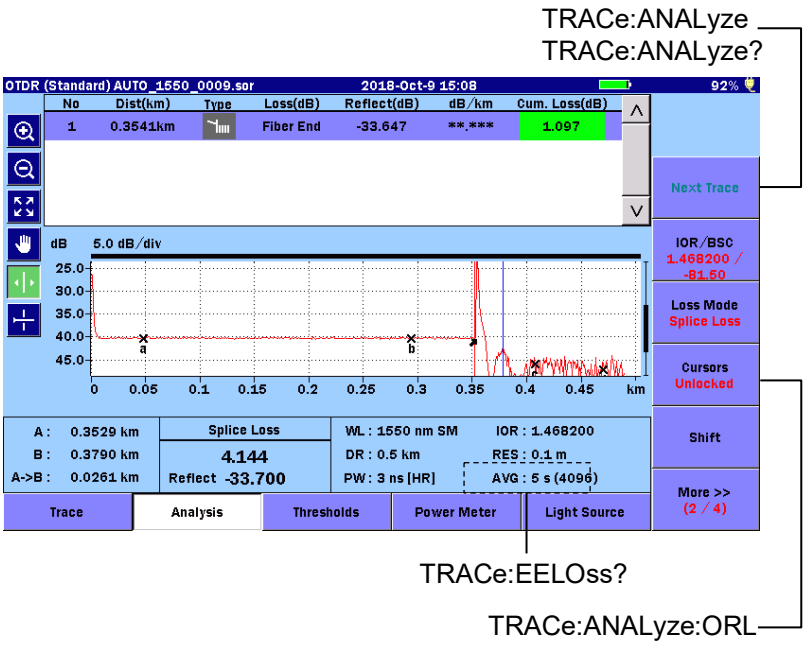


Figure 4.1.4-2 Commands for Analysis

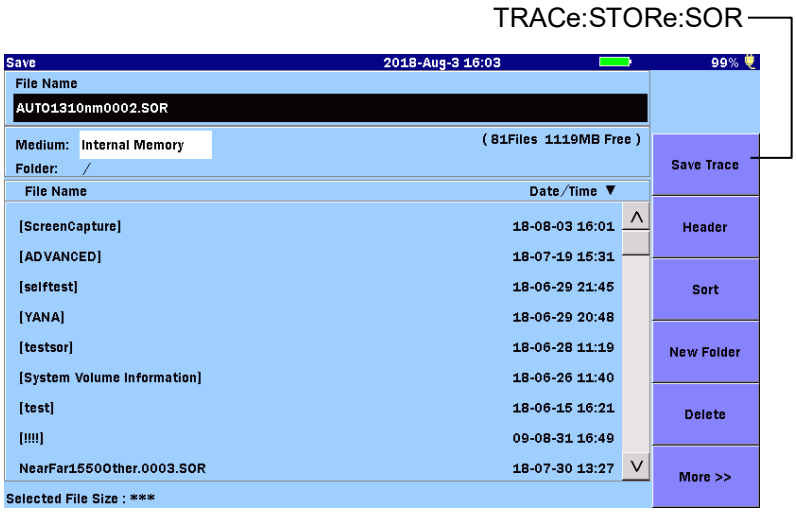


Figure 4.1.4-3 Command for Save Trace

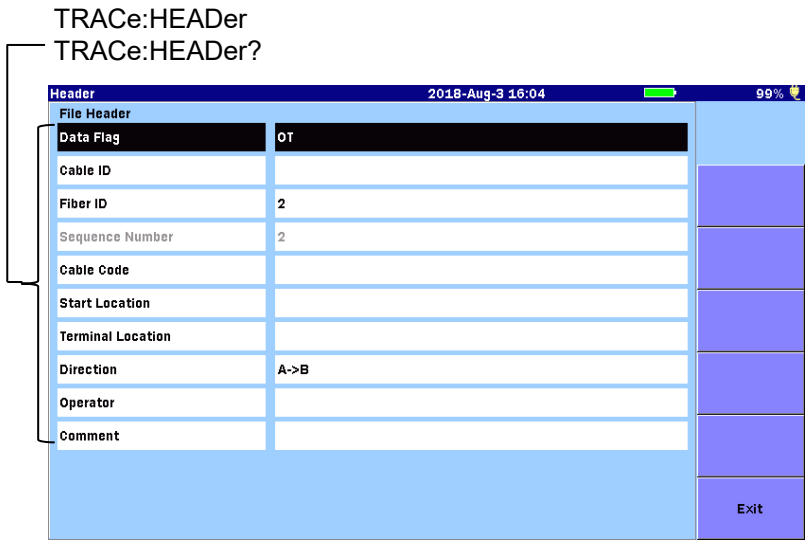


Figure 4.1.4-4 Commands for Header

4.1.5 Display Subsystem Commands

DISPlay:MODE	Selects the reference cursor A or B.
DISPlay:MODE?	Queries which reference cursor is selected.
DISPlay:ZOOM:FULL	Sets zoom to view full trace in current display mode.
DISPlay:ZOOM:HORIzontal	Sets Horizontal display zoom to specified level.
DISPlay:ZOOM:HORIzontal?	Queries Horizontal display zoom level.
DISPlay:ZOOM:VERTical	Sets Vertical display zoom to specified level.
DISPlay:ZOOM:VERTical?	Queries Vertical display zoom level.
DISPlay:SCALe:HORIzontal	Sets Horizontal scale range to specified value.
DISPlay:SCALe:HORIzontal?	Queries Horizontal display scale range value.
DISPlay:SCALe:VERTical	Sets Vertical scale range to specified value.
DISPlay:SCALe:VERTical?	Queries Vertical display scale range value.

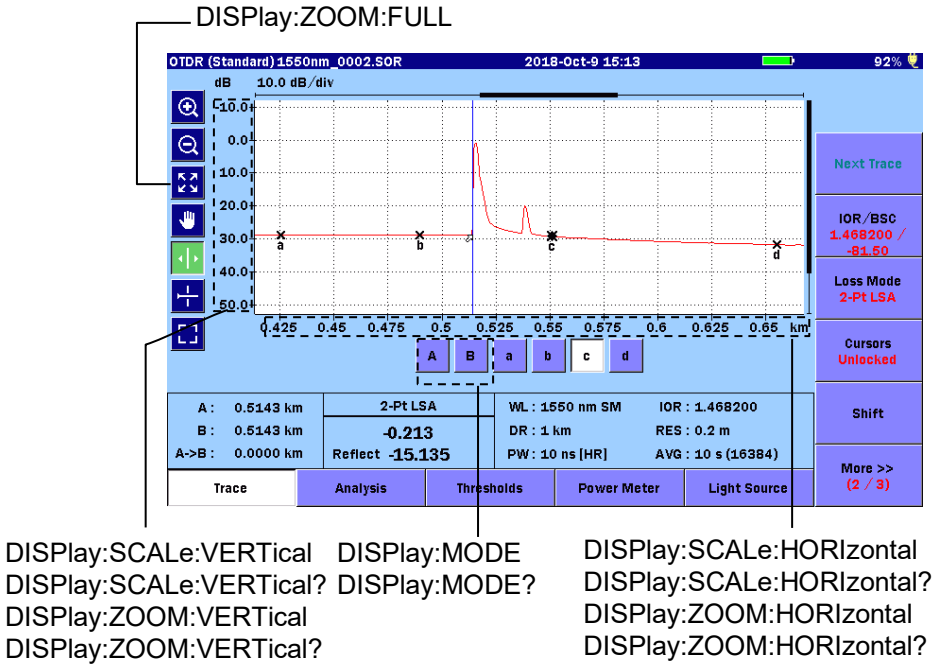


Figure 4.1.5-1 Commands for Display

4.2 Root Level Commands

ABORt

Function

Aborts the active test. The trace data will be lost.

Syntax

```
ABORt
```

Parameters

None

Response Data

None

Errors

(–200, "std_execGen, Test is Inactive")
(–200, "std_execGen, Instrument is Busy")

Example of Use

```
Abor
```

STOP

Function

Stops the active test. The trace data will be preserved.

Syntax

```
STOP
```

Parameters

None

Response Data

None

Errors

(–200, "std_execGen, Test is Inactive")
(–200, "std_execGen, Instrument is Busy")

Example of Use

```
Stop
```

INITiate

Function

Starts OTDR test with currently selected settings. Manual test mode.
This command is an overlapped command.
When this command is executed with “Wavelength all” selected, the measurement starts with the minimum wavelength, and no measurement is done for other wavelengths.

Syntax

```
INITiate
```

Parameters

None

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–200, "std_execGen, Instrument is Busy")
(–200, "std_execGen, Start Test Failed")
(–200, "std_execGen, Connection Check Failed")
(–200, "std_execGen, Live Fiber Check Failed")

Example of Use

```
init
```

INITiate:AUTo

Function

Starts OTDR auto-test. All test parameters are automatically obtained during the pre-scan. This command is an overlapped command.
When this command is executed with “Wavelength all” selected, the measurement starts with the minimum wavelength, and no measurement is done for other wavelengths.

Syntax

```
INITiate:AUTo
```

Parameters

None

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–200, "std_execGen, Instrument is Busy")
(–200, "std_execGen, Start Test Failed")
(–200, "std_execGen, Connection Check Failed")
(–200, "std_execGen, Live Fiber Check Failed")

Example of Use

```
init:auto
```

INITiate:RTIMe

Function

Starts OTDR real time-test. Starts OTDR real time test with currently selected settings. This command is an overlapped command.
When this command is executed with “Wavelength all” selected, the measurement starts with the minimum wavelength, and no measurement is done for other wavelengths.

Syntax

```
INITiate:RTIMe
```

Parameters

None

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–200, "std_execGen, Instrument is Busy")

(–200, "std_execGen, Start Test Failed")
(–200, "std_execGen, Connection Check Failed")
(–200, "std_execGen, Live Fiber Check Failed")

Example of Use

```
init:rtim
```

INITiate?

Function

Queries if test is initiated.

Syntax

```
INITiate?
```

Parameter

None

Response Data

Possible response range: 0|1
0: Test is NOT active.
1: Test is currently active.

Errors

None

Example of Use

```
init?
> 0 <End>
```

4.3 SOURce Subsystem Commands

The SOURce subsystem controls/query OTDR's optical source parameters.

SOURce:WAVelength:AVAilable?

Function

Queries the list of available wavelengths.

Syntax

```
SOURce:WAVelength:AVAilable?
```

Parameter

None

Response Data

List of available wavelength in nanometers (nm).

Errors

None

Example of Use

```
sour:wav:ava?
> 1310, 1550<END>
```

SOURce:WAVelength

Function

Sets current wavelength. Wavelength value units – nm. Wavelength will be set only if the new value matches the one in the list of the available wavelengths.

Syntax

```
SOURce:WAVelength<wsp><value>
```

Parameters

<value>
Integer value format
Range: Integer WL value returned by available wavelengths query command.
Wavelength "ALL" cannot be selected.

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sour:wave 1310
```

SOURce:WAVelength?

Function

Queries current wavelength.
Available first wavelength will be returned when “Wavelength ALL” is set.

Syntax

```
SOURce:WAVelength?
```

Parameter

None

Response Data

Current wavelength value.

Errors

None

Example of Use

```
sour:wav?
> 1310<END>
```

SOURce:RANge:AVAilable?

Function

Queries the list of available ranges for current wavelength settings.

Syntax

```
SOURce:RANge:AVAilable?
```

Parameters

None

Response Data

List of available ranges in kilometers (km).

Errors

None

Example of Use

```
sour:ran:ava?
> 5.0, 10.0, 20.0, 50.0, 100.0, 200.0, 300.0<END>
```

SOURce:RANge

Function

Sets current range.

Syntax

```
SOURce:RANge<wsp><value>
```

Parameters

<value>

Numeric format

Range: Model dependent, numeric value returned by available ranges query command.

Response Data

None

Errors

(–200, "std_execGen, Test is Active")

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sour:ran 100
```

SOURce:RANge?

Function

Queries current range.

Syntax

```
SOURce:RANge?
```

Parameters

None

Response Data

The value is current range in kilometers (km).

Errors

None

Example of Use

```
sour:ran?
> 50.0<END>
```

SOURce:RESo:AVAilable?

Function

Queries the list of available resolution flags for current range settings.

Syntax

```
SOURce:RESo:AVAilable?
```

Parameter

None

Response Data

List of available resolutions:
0: Low Density
1: High Density
2: Very High Density

Errors

None

Example of Use

```
sour:res:ava?
> 0, 1, 2<END>
```

SOURce:RESo

Function

Sets current resolution.

Syntax

```
SOURce:RESo<wsp><value>
```

Parameters

<value>
Integer format
Range: 0|1|2
0: Low Density
1: High Density
2: Very High Density
Available resolution values are dependant on current range settings.

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sour:res 1
```

SOURce:RESo?

Function

Queries current resolution settings flag.

Syntax

```
SOURce:RESo?
```

Parameters

None

Response Data

The value is current resolution:
0: Low Density

1: High Density
2: Very High Density

Errors
None

Example of Use
```
sour:res?
> 1<END>
```

SOURce:PULSe:AVAilable?

Function
Queries the list of available pulse width for current range/resolution settings.

Syntax
```
SOURce:PULSe:AVAilable?
```

Parameters
None

Response Data
List of available pulse width in nanoseconds (ns).

Errors
None

Example of Use
```
sour:puls:ava?
> 10,20,50,100<END>
```

SOURce:PULSe

Function
Sets current pulse width.

Syntax
```
SOURce:PULSe<wsp><value>
```

Parameters
<value>

Numeric format
Range: Integer PW value returned by querying available pulse width query command.
Available pulse width values are dependant on current range/resolution settings.

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sour:puls 100
```

SOURce:PULSe?

Function

Queries current pulse width.

Syntax

```
SOURce:PULSe?
```

Parameter

None

Response Data

The value is current pulse width in nanoseconds (ns).

Errors

None

Example of Use

```
sour:puls?
> 100<END>
```

SOURce:PULSe:ENHanced:AVAilable?

Function

Queries if Enhanced Range is available for the dead zone when using the selected pulse width.

Syntax

```
SOURce:PULSe:ENHanced:AVAilable?
```

Parameters

None

Response Data

Boolean format
1 or 0
0: Unavailable
1: Available

Errors

None

Example of Use

```
sour:puls:enh:ava?
> 1<END>
```

SOURce:PULSe:ENHanced

Function

Sets current pulse width's Dead-zone setting.

Syntax

```
SOURce:PULSe:ENHanced<wsp><value>
```

Parameter

<value>
Boolean format
Range: 1|0
0: Standard (HR)
1: Enhanced Range (ER)

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–104, "std_wrongParamType, Data Type Error")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sour:puls:enh 0
```

SOURce:PULSe:ENHanced?

Function

Queries current pulse width's Dead-zone setting.

Syntax

```
SOURce:PULSe:ENHanced?
```

Parameters

None

Response Data

Boolean format
0: Standard (HR)
1: Enhanced Range (ER)

Errors

None

Example of Use

```
sour:puls:enh?
> 1<END>
```

SOURce:AVERages:TIMe

Function

Sets number of seconds for the test duration for the next test in manual mode.
Also, changes the averaging unit to seconds.

Syntax

```
SOURce:AVERages:TIMe<wsp><value>
```

Parameters

<value>
Integer format
Range: 1 to 3600

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sour:aver:tim 120<END>
```

SOURce:AVERages:TIMe?

Function

Queries number of seconds that have been set for the next test in manual mode.

Syntax

```
SOURce:AVERages:TIMe?
```

Parameters

None

Response Data

Averaging seconds
If the averaging unit is not seconds, an error will occur.

Errors

(–400, "std_queryGen, Invalid Average Mode")

Example of Use

```
sour:aver:tim?
> 120<END>
```

SOURce:AVERages:COUNt

Function

Sets the averaging count (number of sweeps) to be used for the next measurement.
Also, changes the averaging unit to the number of times.
Averaging is performed by the number of sweeps per testing.
Sets the averaging count (1 to 3600).

Syntax

```
SOURce:AVERages:COUNt<wsp><value>
```

Parameters

<value>
Integer format
Range: 1 to 3600

Response Data

None

Error

(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sour:aver:coun 1000<END>
```

SOURce:AVERages:COUNt?

Function

Queries the averaging count (number of sweeps) to be used for the next measurement.

Syntax

```
SOURce:AVERages:COUNt?
```

Parameters

None

Response Data

Averaging count (number of sweeps)
If the averaging unit is not number of times, an error will occur.

Errors

(–400, "std_queryGen, Invalid Average Mode")

Example of Use

```
sour:aver:coun?
> 1000<END>
```

SOURce:AVERages:EXPonent

Function

Sets the averaging count (number of sweeps) used for the next measurement according to the total number of times to launch pulses.
Also, changes the averaging unit to the number of times.
Total number of times to launch pulses =

Number of sweeps × Number of pulses to launch per sweep

Set the total number of times to launch pulses in exponential form with base 2.

Syntax

```
SOURce:AVERages:EXPonent<wsp><value>
```

Parameters

<value>
Character format
Range: 2^N N: 8 to 21

Note:

The range of the total number of times to launch pulses may be limited depending on the measurement conditions including distance range.
Use SOURce:AVERages:EXPonent? to check if the specified number of times has been set.

Also, depending on the measurement waveform, the total number of times to launch pulses of the measurement result may differ from the set value.
Use SENSe:AVERages? to check the total number of times to launch pulses in the measurement results.

Response Data

None

Error

(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sour:aver:exp 10<END>
```

SOURce:AVERages:EXPonent?

Function

Queries the total number of times, in exponential form with base 2, the ACCESS Master has launched pulses.

Syntax

```
SOURce:AVERages:EXPonent?
```

Parameters

None

Response Data

Averaging count

<2^N When the total number of times the ACCESS Master has launched pulses is more than 2^{N-1} and less than 2^N

2^N When the total number of times the ACCESS Master has launched pulses is 2^N

If the averaging unit is not number of times, an error will occur.

Errors

(–400, "std_queryGen, Invalid Average Mode")

Example of Use

```
sour:aver:exp 16
sour:aver:exp?
> 2^16<END>
```

4.4 SENSe Subsystem Commands

SENSe:AVERages?

Function

Queries the averages count since the test started.

Syntax

```
SENSe:AVERages?
```

Parameters

None

Response Data

Number of averages

Errors

(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
sens:aver?
> 4096<END>
```

SENSe:AVERages:TIMe?

Function

Queries number of seconds that have been completed on the trace or since the test started.
Actual average time may be longer than the set average time depending on the resolution and distance range setting.

Syntax

```
SENSe:AVERages:TIMe?
```

Parameters

None

Response Data

Number of seconds

Errors

(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
sens:aver:tim?
> 28<END>
```

SENSe:TRACe:READY?

Function

Queries if trace data is ready.

Syntax

```
SENSe:TRACe:READY?
```

Parameters

None

Response Data

Possible response values:

1: Trace data is ready and can be transferred.

0: No trace data available in the memory.

Errors

None

Example of Use

```
sens:trac:ready?
> 1<END>
```

SENSe:CONCheck

Function

Sets Connection Check option ON or OFF.

Syntax

```
SENSe:CONCheck<wsp><value>
```

Parameters

<value>

Boolean format

1 or on: Connection check is ON.

0 or off: Connection check is OFF.

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–104, "std_wrongParamType, Data Type Error")

Example of Use

```
sens:conc ON<END>
```

SENSe:CONCheck?

Function

Queries if connection check option is enabled.

Syntax

```
SENSe:CONCheck?
```

Parameters

None

Response Data

Possible response values:
1: Connection check is ON.
0: Connection check is OFF.

Errors

None

Example of Use

```
sens:conc?
> 1<END>
```

SENSe:LIVCheck

Function

Sets live fiber check option ON or OFF.

Syntax

```
SENSe:LIVCheck<wsp><value>
```

Parameters

<value>

Boolean format

1 or on: Live fiber check is ON.

0 or off: Live fiber check is OFF.

Response Data

None

Errors

(–200, "std_execGen, Test is Active")

(–104, "std_wrongParamType, Data Type Error")

Example of Use

```
sens:livc ON<END>
```

SENSe:LIVCheck?

Function

Queries if live fiber check option is enabled.

Syntax

```
SENSe:LIVCheck?
```

Parameters

None

Response Data

Possible response values:

1: Live fiber check is ON.

0: Live fiber check is OFF.

Errors

None

Example of Use

```
sens:livc?
> 1<END>
```

SENSe:FIBCheck

Function

Sets fiber length check option ON or OFF.

Syntax

```
SENSe:FIBCheck<wsp><value>
```

Parameters

<value>

Boolean format

1 or on: Fiber length check is ON.

0 or off: Fiber length check is OFF.

Response Data

None

Errors

(–200, "std_execGen, Test is Active")

(–104, "std_wrongParamType, Data Type Error")

Example of Use

```
sens:fibc ON<END>
```

SENSe:FIBCheck?

Function

Queries if fiber length check option is enabled.

Syntax

```
SENSe:FIBCheck?
```

Parameters

None

Response Data

Possible response values:

1: Fiber length check is ON.

0: Fiber length check is OFF.

Errors

None

Example of Use

```
sens:fibc?
> 1<END>
```

SENSe:FIBer:IOR

Function

Sets IOR (index of refraction). This value will be used for the next test.

Syntax

```
SENSe:FIBer:IOR<wsp><value>
```

Parameters

<value>
Floating point format
Range: 1.3 to 1.7

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:fib:ior 1.45
```

SENSe:FIBer:IOR?

Function

Queries IOR.

Syntax

```
SENSe:FIBer:IOR?
```

Parameters

None

Response Data

Possible response is value in range:
1.3 to 1.7

Errors

(–200, "std_execGen, Test is Inactive")

Example of Use

```
sens:fib:ior?
> 1.450000<END>
```

SENSe:FIBer:BSC

Function

Sets BSC (backscatter coefficient). This value will be used for the next test.

Syntax

```
SENSe:FIBer:BSC<wsp><value>
```

Parameters

<value>
Floating point format
Range: –90.0 to –40.0

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:fib:bsc -83.0
```

SENSe:FIBer:BSC?

Function

Queries BSC.

Syntax

```
SENSe:FIBer:BSC?
```

Parameters

None

Response Data

Possible response is value in range:
–90.0 to –40.0

Errors

None

Example of Use

```
sens:fib:bsc?
> -83.0<END>
```

SENSe:HOFFset

Function

Set horizontal offset for the displayed trace(s). Offset value units – km.

Syntax

```
SENSe:HOFFset<wsp><value>
```

Parameters

<value>
Floating point format
Range: Offset value can be set plus/minus maximum distance range.

Response Data

None

Errors

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:hoff 10.0
```

SENSe:HOFFset?

Function

Queries horizontal offset for the displayed trace(s).

Syntax

```
SENSe:HOFFset?
```

Parameters

None

Response Data

Current horizontal offset value.

Errors

None

Example of Use

```
sens:hoff?
> 0<END>
```

SENSe:VOFFset

Function

Sets vertical offset for the displayed trace(s). Offset value units – dB.

Syntax

```
SENSe:VOFFset<wsp><value>
```

Parameters

<value>

Floating point format

Range: Offset value can be set plus/minus current dynamic range. (–64.0 to 64.0)

Response Data

None

Errors

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:voff -5.0
```

SENSe:VOFFset?

Function

Queries vertical offset for the displayed trace(s).

Syntax

```
SENSe:VOFFset?
```

Parameters

None

Response Data

Current vertical offset value.

Errors

None

Example of Use

```
sens:voff?
> 0<END>
```

SENSe:ACURsor

Function

Sets A cursor position. Cursor position units – km.

Note:

If remote-controlled by SCPI command, the Marker Mode is forcibly changed to **Movement**.

Syntax

```
SENSe:ACURsor<wsp><value>
```

Parameters

<value>

Floating point format

Range: 0.0 to Current distance range.

Response Data

None

Errors

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:acur 20.5
```

SENSe:ACURsor?

Function

Queries current A cursor position.

Syntax

```
SENSe:ACURsor?
```

Parameters

None

Response Data

Current A cursor position value.

Errors

None

Example of Use

```
sens:acur?
> 20.5<END>
```

SENSe:BCURsor

Function

Sets B cursor position. Cursor position units – km.

Note:

If remote-controlled by SCPI command, the Marker Mode is forcibly changed to **Movement**.

Syntax

```
SENSe:BCURsor<wsp><value>
```

Parameters

<value>

Floating point format

Range: 0.0 to Current distance range.

Response Data

None

Errors

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:bcur 20.5
```

SENSe:BCURsor?

Function

Queries current B cursor position.

Syntax

```
SENSe:BCURsor?
```

Parameters

None

Response Data

Current B cursor position value.

Errors

None

Example of Use

```
sens:bcur?
> 20.5<END>
```

SENSe:LSALeft

Function

Sets start and stop for left LSA marker. Start and stop units – km.

Note:

If remote-controlled by SCPI command, the Marker Mode is forcibly changed to **Movement**.

Syntax

```
SENSe:LSALeft<wsp><start>,<stop>
```

Parameters

<start>

Floating point format

Range: –100.0 to 400.0.

<stop>

Floating point format

Range: –100.0 to 400.0.

Start value must be less or equal to stop value.

Response Data

None

Errors

(–200, "std_execGen, LSA Inactive State")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:lsal 0.0,0.5
```

SENSe:LSALeft?

Function

Queries left LSA values.

Syntax

```
SENSe:LSALeft?
```

Parameters

None

Response Data

Start and stop for left LSA marker. Start and stop units – km.

Errors

(–400, "std_queryGen, LSA Inactive State")

Example of Use

```
sens:lsal?
> 0.0,0.5<END>
```

SENSe:LSARight

Function

Sets start and stop for right LSA marker. Start and stop units – km.

Note:

If remote-controlled by SCPI command, the Marker Mode is forcibly changed to **Movement**.

Syntax

```
SENSe:LSARight<wsp><start>,<stop>
```

Parameters

<start>
Floating point format
Range: –100.0 to 400.0.
<stop>
Floating point format
Range: –100.0 to 400.0.
Start value must be less or equal to stop value.

Response Data

None

Errors

(–200, "std_execGen, LSA Inactive State")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:lsal 0.0,0.5
```

SENSe:LSARight?

Function

Queries right LSA values.

Syntax

```
SENSe:LSARight?
```

Parameters

None

Response Data

Start and stop for right LSA marker. Start and stop units – km.

Errors

(–400, "std_queryGen, LSA Inactive State")

Example of Use

```
sens:lsar?
> 0.0, 0.5<END>
```

SENSe:LOSS:MODE

Function

Sets current Loss Mode.

Syntax

```
SENSe:LOSS:MODE<wsp><value>
```

Parameters

<value>
Integer format
Range: 0|1|2|3|4|5|6
0: Splice Loss
1: 2-Pt Loss
2: 2-Pt LSA
3: dB/km Loss
4: dB/km LSA
5: 2-Pt, dB/km
6: ORL

Response Data

None

Errors

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:loss:mode 0
```

SENSe:LOSS:MODE?

Function

Queries current Loss Mode.

Syntax

```
SENSe:LOSS:MODE?
```

Parameters

None

Response Data

Possible responses are:

0: Splice Loss

1: 2-Pt Loss

2: 2-Pt LSA

3: dB/km Loss

4: dB/km LSA

5: 2-Pt, dB/km

6: ORL

Errors

None

Example of Use

```
sens:loss:mode?
> 0<END>
```

SENSe:ORL:MODE

Function

Sets current ORL Mode.

Syntax

```
SENSe:ORL:MODE<wsp><value>
```

Parameters

<value>

Integer format

Range: 0 | 1 | 2

0: A Cursor

1: Origin

2: Full Trace

Response Data

None

Errors

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:loss:mode 0
```

SENSe:ORL:MODE?

Function

Queries current ORL Mode.

Syntax

```
SENSe:ORL:MODE?
```

Parameters

None

Response Data

Possible responses are:

0: A Cursor

1: Origin

2: Full Trace

Errors

None

Example of Use

```
sens:orl:mode?
> 0<END>
```

SENSe:ANALyze:PARameters

Function

Sets Auto detection Parameters for the next test.

Syntax

```
SENSe:ANALyze:PARameters<wsp><splice loss>,
<reflectance>,<end loss>,<pon loss>
```

Parameters

Double Precision:

<splice loss>	Splice Loss	Range: 0.01 to 9.99
<reflectance>	Reflectance	Range: –70.0 to –20.0
<end loss>	Splice Loss (Fiber End)	Range: 1 to 99
<pon loss>	Splitter Loss	Range: 1.0 to 30.0

Response Data

None

Errors

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:anal:par 0.05,-60.0,3.0,10.0
```

SENSe:ANALyze:PARameters?

Function

Queries current Auto detection parameters.

Syntax

```
SENSe:ANALyze:PARameters?
```

Parameters

None

Response Data

<event loss>,<reflectance>,<end loss>,<pon loss><END>

Errors

None

Example of Use

```
sens:anal:par?
> 0.050000,-60.000000,3.000000,10.000000<END>
```

SENSe:ANALyze:PARameters:ENDRefl

Function

Sets Auto detection Parameters for the next test.

Syntax

```
SENSe:ANALyze:PARameters:ENDRefl<wsp>
<end reflectance>
```

Parameters

Double Precision:

<end reflectance> Reflectance (Fiber End) Range: –70.0 to –10.0, 0
If set to 0, fiber end detection is not applied (N/A).

Response Data

None

Errors

(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
sens:anal:par:endr -25.0
```

SENSe:ANALyze:PARameters:ENDRefl?

Function

Queries current Auto detection parameters.

Syntax

```
SENSe:ANALyze:PARameters:ENDRefl?
```

Parameters

None

Response Data

<end reflectance><END>

Errors

None

Example of Use

```
sens:anal:par:endr?
> -25.000000<END>
```

SENSe:ANALyze:AUTO

Function

Sets ON/OFF analysis to be performed automatically after the test is complete.

Syntax

```
SENSe:ANALyze:AUTO<wsp><value>
```

Parameters

<value>

Boolean format

Range: 0|1

0: Auto-analysis is OFF.

1: Auto-analysis is ON.

Response Data

None

Errors

(–104, "std_wrongParamType, Data Type Error")

Example of Use

```
sens:anal:auto 0
```

SENSe:ANALyze:AUTO?

Function

Queries if auto-analysis after test is set to ON.

Syntax

```
SENSe:ANALyze:AUTO?
```

Parameters

None

Response Data

Possible responses are:

0: Auto-analysis is OFF.

1: Auto-analysis is ON.

Errors

None

Example of Use

```
sens:anal:auto?
> 0<END>
```

4.5 TRACe Subsystem Commands

The TRACe subsystem provides access to the trace analysis and trace data.

TRACe:PARameters?

Function

Queries the trace parameters by text format.

Syntax

```
TRACe:PARameters?
```

Parameters

None

Response Data

Trace parameters as comma separated numeric values.
<wave>, <range>, <pulse>, <avg>, <reso>, <ior>, <bsc>, <enh><END>

Errors

(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
trac:par?
> 1310, 16.415554, 50, 6144, 0.656621, 1.467700, -78.500000, 1<END>
```

TRACe:ANALyze

Function

Performs analysis on the trace.
To be used if analysis parameters are changed or auto analysis is set to OFF.
This command is an overlapped command.

Syntax

```
TRACe:ANALyze
```

Parameters

None

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–200, "std_execGen, Trace Not Ready")

Example of Use

```
trac:anal
```

TRACe:ANALyze?

Function

Queries if analysis is done on the trace.

Syntax

```
TRACe:ANALyze?
```

Parameters

None

Response Data

Possible responses are:
0: Trace not analyzed.
1: Trace is analyzed.

Errors

(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
trac:anal?
> 0<END>
```

TRACe:ANALyze:ORL

Function

Performs ORL calculations on the trace.
This command is an overlapped command.

Syntax

```
TRACe:ANALyze:ORL
```

Parameters

None

Response Data

None

Errors

(–200, "std_execGen, Test is Active")
(–200, "std_execGen, Trace Not Ready")
(–200, "std_execGen, Invalid Loss Mode")

Example of Use

```
trac:anal:orl
```

TRACe:MDLOss?

Function

Get trace loss values. The returned values depend on current loss mode.
For single loss modes only first value is valid. If loss mode is not calculable the returned value will be –99.99.

Syntax

```
TRACe:MDLOss?
```

Parameters

None

Response Data

Calculated loss values. Two comma separated numeric values.

Errors

(–200, "std_execGen, Test is Active")
(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
trac:mdlo?
> -4.610,-99.99<END>
```

TRACe:EELOss?

Function

Get trace end-to-end loss. If end-to-end loss is not calculable the returned value will be –99.99.

Syntax

```
TRACe:EELOss?
```

Parameters

None

Response Data

Calculated end-to-end loss value.

Errors

(–200, "std_execGen, Test is Active")
(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
trac:eelo?
> -4.610<END>
```

TRACe:LOAD:SOR?

Function

Get SOR trace object.
Refer to “Binary Data” in Section 2.6.3 “Data Formats” for further details.

Syntax

```
TRACe:LOAD:SOR?
```

Parameters

None

Response Data

SOR trace file as an array of bytes per SCPI binary transfer specifications.

Errors

(–200, "std_execGen, Test is Active")

(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
trac:load:sor?
> "BINARY ARRAY"
```

#524047 //SCPI data size message for binary data transfer followed by array of SOR file bytes.

TRACe:LOAD:TEXT?

Function

TRACe:LOAD:TEXT? command has three mode.

TRACe:LOAD:TEXT?

Get SOR trace information in text format and full trace data.

TRACe:LOAD:TEXT? <start>

<start>: Start position of the trace data. Distance unit is km.

Get the trace data from specified start point to the end of distance range.

TRACe:LOAD:TEXT? <start>,<end>

<start>: Start position of the trace data. Distance unit is km.

<end>: End position of the trace data. Distance unit is km.

Get the trace data form specified start to end position.

Refer to "Binary Data" in Section 2.6.3 "Data Formats" for further details.

Syntax

```
TRACe:LOAD:TEXT?
TRACe:LOAD:TEXT?<wsp><start>
TRACe:LOAD:TEXT?<wsp><start>,<end>
```

Parameters

<start>
Floating point format
Range: 0.000000 to Current distance range.
<end>
Floating point format
Range: 0.000000 to Current distance range.
<start> value must be less or equal to <end> value.

Response Data

SOR trace data as an array of bytes per SCPI binary transfer specifications.

Errors

(–108, "std_tooManyParameters, Parameter not Allowed")
(–200, "std_execGen, Test is Active")
(–224, "std_illegalParmValue, Invalid Parameter Value")
(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
trac:load:text?
#6140479 //SCPI data size message for binary data
transfer
WL   = 1310 nm //Wavelength
FBR  = SM //Fiber Type
DR   = 5 km //
PW   = 50 ns [ER] //Pulse Width and resolution type
AVG  = 6144 //Number of hardware averages
IOR  = 1.467700 //IOR value
BSC  = -78.50 //BSC value
DATE = 08/13/09 //Date of test
TIME = 10:19 PM //Time of test
MXDB = 64 dB //dB Range
RESO = 0.200 m //Resolution value
DX   = 0.20440100621721 m //Point spacing
PTS  = 25001 //Number of data points in the trace

//Start of trace data points
1000
9741
41291
41923
.....

9741
9741
0
//End of trace data points
```

```
Events  1 //Number of events found by analysis

Dist            1.0505 km //Event distance
Type            E //Event type
Loss            >3.00 dB //Event loss value
Reflectance      N/A //Event reflectance value
dB / km         59.420 dB //dB/km Loss value
Cumulative Loss  1.81 dB //Cumulative loss value
```

TRACe:LOAD:DATA?

Function

TRACe:LOAD:DATA? command has four mode.

TRACe:LOAD:DATA?

Get full trace data.

TRACe:LOAD:DATA? <start>

<start>: Start position of the trace data. Distance unit is km.

Get all the trace data form specified start point to the end of distance range.

TRACe:LOAD:DATA? <start>,<end>

<start>: Start position of the trace data. Distance unit is km.

<end>: End position of the trace data. Distance unit is km.

Get all the trace data form specified start to end position.

TRACe:LOAD:DATA? <start>,<end>,<space>

<start>: Start position of the trace data. Distance unit is km.

<end>: End position of the trace data. Distance unit is km.

<space>: Data point spacing in terms of resolution.

Get the trace data form specified start to end position at the interval specified by space.

Refer to “Binary Data” in Section 2.6.3 “Data Formats” for further details.

Syntax

```
TRACe:LOAD:DATA?<wsp><start>,<end>,<space>
```

Parameters

<start> Starting distance (km)
Floating point format
Range: 0.0 to (Current distance range – <space>*resolution)

<end> Ending distance (km)
Floating point format
Range: (<start>+<space>*resolution) to (Current distance range)

<space> data point spacing in terms of resolution
Numeric format
Range: 1 to (Max number of data points between <start> and <end> distance) <start> Starting distance (km)
Numeric format
Range: 0.0 to (Current distance range – <space>*resolution)

Start value must be less or equal to end value.

Response Data

Requested data points as an array of bytes per SCPI binary transfer specifications.

Errors

(–225, "std_illegalState, Trace Not Ready")
(–224, "std_illegalValue, Invalid Parameter Value")

Example of Use

```
trac:load:data? 0.0,10.0,1
> "BINARY ARRAY"
```

#510006 //SCPI data size message for binary data transfer followed by array of data point bytes. First four bytes – unsigned long (big endian) for number of data points to follow,
Every next two bytes – unsigned short for each data point requested

TRACe:HEADer

Function

Sets Trace Header. If set to blank, parameter is no characters. But <Data Flag> and <Direction> cannot be blank (Always set).

If you want to set blank in <Comment>, add a comma at the last argument.

Syntax

```
TRACe:HEADer<wsp><Data Flag>,<Cable ID>,<Fiber ID>,
<Cable Code>,<Start location>,<Terminal Location>,
<Direction>,<Operator>,<Comment>
```

Parameters

<Data Flag>	BC, RC, OT
<Cable ID>	Up to 30 characters
<Fiber ID>	Up to 30 characters
<Cable Code>	Up to 30 characters
<Start location>	Up to 30 characters
<Terminal Location>	Up to 30 characters
<Direction>	0: A->B, 1: B->A
<Operator>	Up to 30 characters
<Comment>	Up to 30 characters

Response Data

None

Errors

(–108, "std_tooManyParameters, Parameter not Allowed")
(–109, "std_tooFewParameters, Missing Parameter")
(–224, "std_illegalParmValue, Invalid Parameter Value")

Example of Use

```
trac:head OT,1,1,ABC,Tokyo,Yokohama,1,Anritsu,TEST
trac:head BC,,,,,,0,,,
```

TRACe:HEADer?

Function

Queries Trace Header.

Syntax

```
TRACe:HEADer?
```

Parameters

None

Response Data

Nine header.

Errors

(–108, "std_tooManyParameters, Parameter not Allowed")

Example of Use

```
trac:head?
> OT, 1,1,ABC,Tokyo,Yokohama,1,Anritsu,TEST<END>
```

TRACe:STORe:SOR

Function

Stores the SOR file in internal memory of the ACCESS Master.

Syntax

```
TRACe:STORe:SOR<wsp><filepath&name>
```

Parameters

<filepath&name> File path and file name to save the SOR file

Response Data

None

Errors

(–108, "std_tooManyParameters, Parameter not Allowed")
(–109, "std_tooFewParameters, Missing Parameter")
(–224, "std_illegalParmValue, Invalid Parameter Value")
(–400, "std_queryGen, Trace Not Ready")

Example of Use

```
trac:stor:sor test.sor
```

test.sor file is stored in root folder of internal memory.

```
trac:stor:sor TEST/test.sor
```

test.sor file is stored in TEST folder of internal memory.

4.6 DISPlay Subsystem Commands

The DISPlay subsystem provides access to the display mode and display zooming/scaling.

DISPlay:MODE

Function

Selects the reference cursor A or B.

Syntax

```
DISPlay:MODE<wsp><mode>
```

Parameters

<mode> Reference cursor
Numeric format
Range: 0|1
0: Cursor A
1: Cursor B

Response Data

None

Errors

(–224, "std_illegalValue, Invalid Parameter Value")

Example of Use

```
disp:mode 1
```

DISPlay:MODE?

Function

Queries which reference cursor is selected.

Syntax

```
DISPlay:MODE?
```

Parameters

None

Response Data

Reference cursor as numeric values.

Errors

None

Example of Use

```
disp:mode?
> 1
```

DISPlay:ZOOM:FULL

Function

Sets display zoom to full trace in current display mode.

Syntax

```
DISPlay:ZOOM:FULL
```

Parameters

None

Response Data

None

Errors

None

Example of Use

```
disp:zoom:full
```

DISPlay:ZOOM:HORIzontal

Function

Sets Horizontal display zoom to specified level.

Syntax

```
DISPlay:ZOOM:HORIzontal<wsp><level>
```

Parameters

<level> Zoom level
Numeric format
Range: 0 to (6 to 16) Depends on current distance range
0: Full zoom in,
(6 to 16): Full Zoom out

Note:

The maximum value for each distance is as follows.

0.5 km:	6	25 km:	11
1 km:	7	50 km:	12
2.5 km:	8	100 km:	13
5 km:	9	200 km:	14
10 km:	10	300 km:	16

Response Data

None

Errors

(–224, "std_illegalValue, Invalid Parameter Value")

Example of Use

```
disp:zoom:hori 2
```

DISPlay:ZOOM:HORIzontal?

Function

Queries Horizontal display zoom level.

Syntax

```
DISPlay:ZOOM:HORIzontal?
```

Parameters

None

Response Data

Horizontal zoom level as numeric value.

Errors

None

Example of Use

```
disp:zoom:hori?
> 5<END>
```

DISPlay:ZOOM:VERTical

Function

Sets Vertical display zoom to specified level.

Syntax

```
DISPlay:ZOOM:VERTical <wsp><level>
```

Parameters

<level> Zoom level
Numeric format
Range: 0 to 6
0: Full zoom in,
6: Full Zoom out

Response Data

None

Errors

(–224, "std_illegalValue, Invalid Parameter Value")

Example of Use

```
disp:zoom:vert 2
```

DISPlay:ZOOM:VERTical?

Function

Queries Vertical display zoom level.

Syntax

```
DISPlay:ZOOM:VERTical?
```

Parameters

None

Response Data

Vertical zoom level as numeric value.

Errors

None

Example of Use

```
disp:zoom:vert?
> 5<END>
```

DISPlay:SCALe:HORIzontal

Function

Sets Horizontal scale range to specified value.
The distance specified with Horizontal scale is displayed on screen.

Syntax

```
DISPlay:SCALe:HORIzontal<wsp><scale>
```

Parameters

<scale> Horizontal scale range value in km
Floating point format
Range: 0.0124 to (0.5022 to 300.0056)
0.0124: Full zoom in
0.5022 to 300.0056: Full Zoom out
Depends on current distance range (0.5 to 300) km

Note:

There are 17 predefined scale ranges (0.0124, 0.0186, 0.0310, 0.0558, 0.1054, 0.2542, 0.5022, 1.0044, 2.5048, 5.0034, 10.0006, 25.0046, 50.0030, 100.0060, 200.0058, 250.0026, 300.0056), the specified <scale> value will snap to the nearest highest predefined scale value.
The maximum value for each distance is as follows.

0.5 km:	0.5022	25 km:	25.0046
1 km:	1.0054	50 km:	50.0030
2.5 km:	2.5048	100 km:	100.0060
5 km:	5.0034	200 km:	200.0058
10 km:	10.0006	300 km:	300.0056

Response Data

None

Errors

(–224, "std_illegalValue, Invalid Parameter Value")

Example of Use

```
disp:scal:hori 5.0
```

DISPlay:SCALe:HORIzontal?

Function

Queries Horizontal display scale range value in km.

Syntax

```
DISPlay:SCALe:HORIzontal?
```

Parameters

None

Response Data

Horizontal scale range value in km as numeric value.

Errors

None

Example of Use

```
disp:scal:hori?
> 5.0034<END>
```

DISPlay:SCALe:VERTical

Function

Set Vertical display scale range to specified value.
The value specified with Vertical display scale is displayed on screen.

Syntax

```
DISPlay:SCALe:VERTical<wsp><scale>
```

Parameters

<scale> Vertical scale range value in dB
Floating point format
Range: 0.5 to 65
0.5: Full zoom in,
65: Full Zoom out

Note:

There are 7 predefined scale ranges (0.5, 1.0, 2.5, 5.0, 10.0, 25.0, 65.0), the specified <scale> value will snap to the nearest highest predefined scale value.

Response Data

None

Errors

(–224, "std_illegalValue, Invalid Parameter Value")

Example of Use

```
disp:scal:vert 0.5
```

DISPlay:SCALe:VERTical?

Function

Queries Vertical display scale range value in dB.

Syntax

```
DISPlay:SCALe:VERTical?
```

Parameters

None

Response Data

Vertical scale range in dB as numeric value.

Errors

None

Example of Use

```
disp:scal:vert?
> 10.0<END>
```