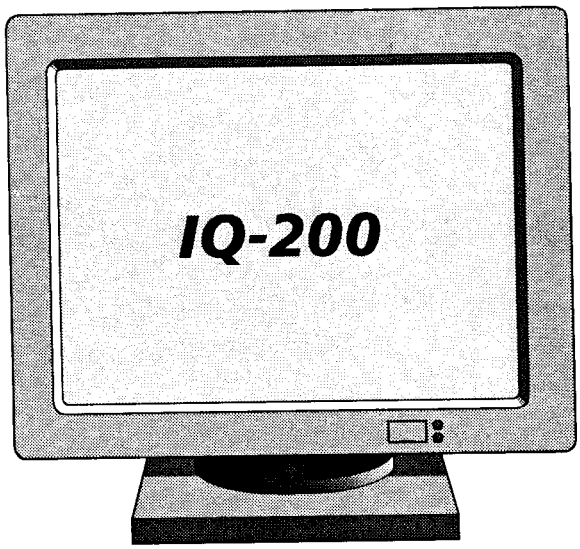
IQ-200

GPIB and IQ Applications



Development Guide

Third Edition

P/N: MAN-075-I .3AN

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January 2000

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1 Introduction

About This Guide

The IQ-200 General Purpose Interface Bus (GPIB) and IQ-Application Development Guide provides detailed information that will enable a programmer to create integrated applications, controlling the IQ-200 system components via GPIB, DDE, or RS-232. This document also offers a comprehensive introduction into the various IQ configurations.

Here is a summary of the main sections:

Integrated Applications - Overview

This section describes the different combinations for which the IQ-200 system may be configured. This overview covers a number of important concepts, including how the various hardware and software components interact.

SCPI Manager

This section describes the SCPI Manager, a simple but very important program that provides the interface between the IQ-200 system and the integrated applications. Understanding the SCPI Manager is very important, whether programming for GPIB, Dynamic Data Exchange (DDE), or RS-232 control.

The IQ-203 as a GPIB Device, DDE Integrated Applications, and the IQ-203 as a GPIB Controller

These three sections describe how to configure and operate the IQ-200 components with each of the different interface options.

SCPI Commands

This section provides an introduction to the SCPI standard, describes the IQ-200 SCPI command format, and provides a detailed description of all the available commands.

Quick Reference Command Trees

This section provides a quick reference list of all the commands for each module.

Error Messages

This section describes the error message format, followed by a list of all error messages.

Contacting the Customer Service Group

If you encounter any difficulty while operating this product, please call EXFO at one of the offices listed below. Our Customer Service Group is available in North America from 7:30 a.m. to 8:00 p.m. (Eastern Standard Time), Monday to Friday.

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2 IQ-200 Integrated Applications (Overview)

The IQ-200 family of products is designed to be a flexible, user-friendly, easily programmable, modular, fiber-optic test system. The flexibility of the IQ platform arises from the PC architecture, the Windows software, the system modularity, and the many different interface configurations. Modules can be used as stand-alone instruments or can be integrated into complex or automated measurement applications. The stand-alone operation of the different modules is explained in the Instruction Manual provided for each module. This manual, *The GPIB and IQ Application Development Guide*, will explain the different configuration options and will describe in detail how to create high level integrated IQ-applications.

The following subsections introduce the different configuration options.

GPIB Device

The General Purpose Interface Bus (GPIB) Device (or talker/listener) configuration permits a user to control the IQ-200 Optical Test System using a GPIB interface. This setup requires a GPIB Device expansion card (option I1) installed in the IQ-203 mainframe or into the host PC (when using an IQ-206 PC Expansion Card). Figures 2-1 and 2-2 show the IQ-200 Optical Test System as a GPIB device.

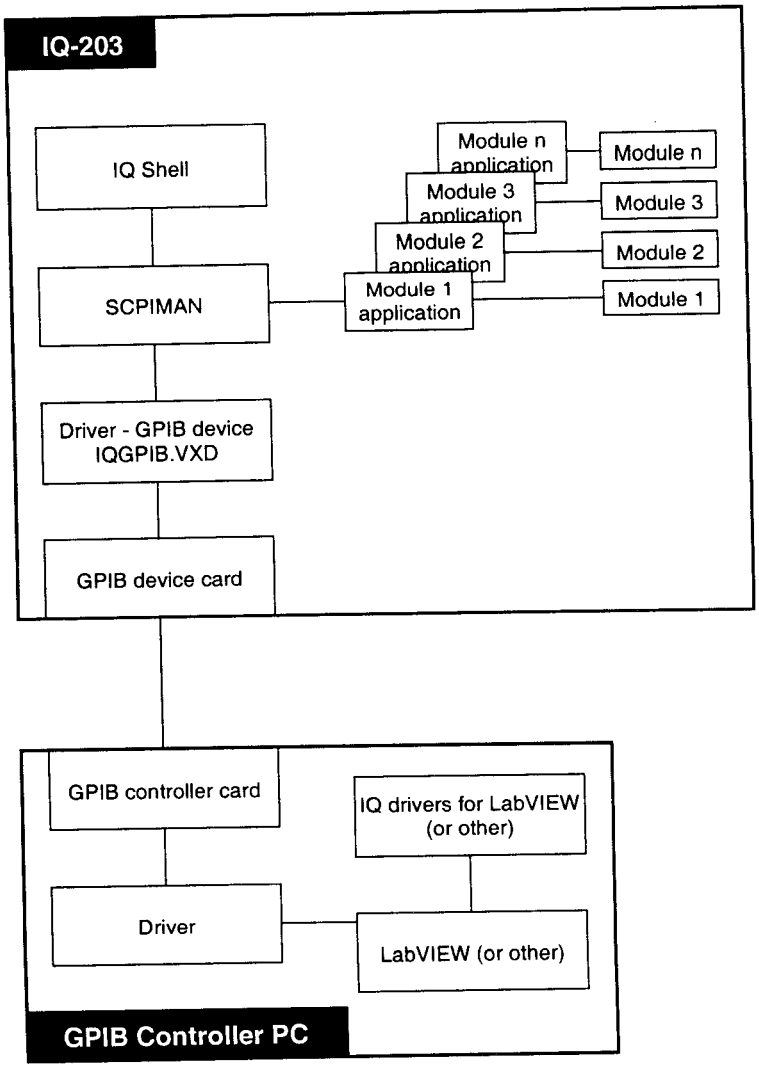

Figure 2-1. *The IQ-203 Mainframe as a GPIB Device*

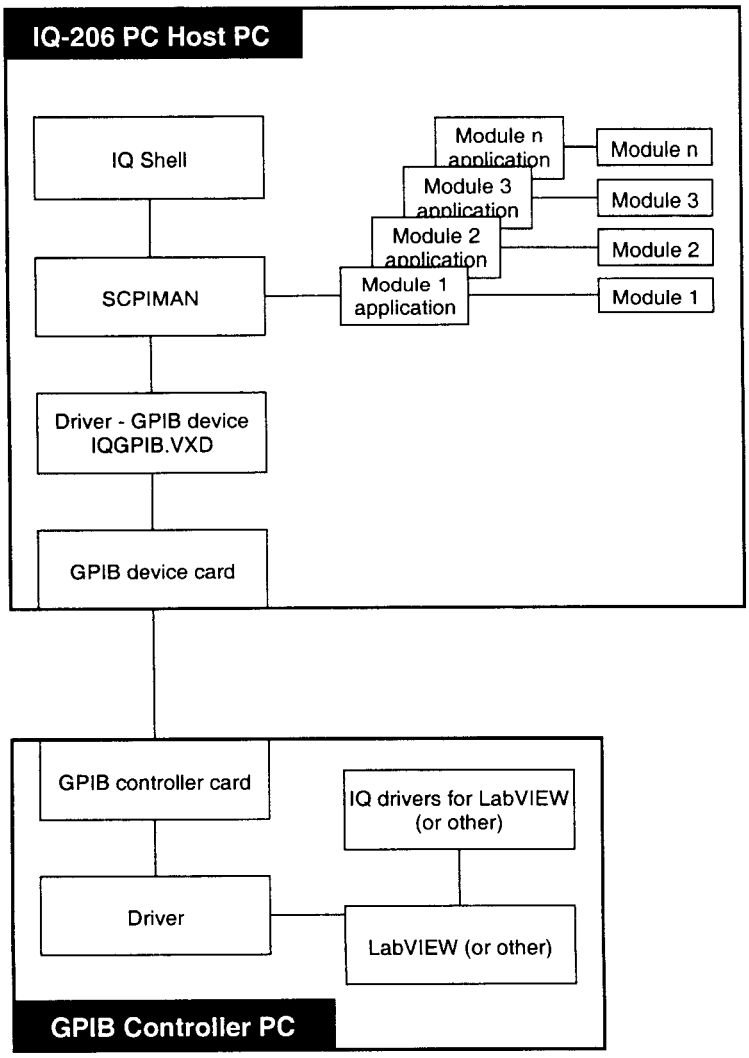

Figure 2-2. *The IQ-206 PC Expansion Card as a GPIB Device*

CAUTION

The GPIB device card must be installed at the factory. Attempting to install any other GPIB card will void the product warranty.

In this configuration the GPIB controller card (available from several manufacturers) and application software (provided by the user) are installed in the host PC. Commands will be transmitted along the GPIB bus, recognized and decoded by the IQ-203 device card, interpreted by the SCPI Manager, and dispatched to the appropriate module control software.

Applications can be created in any programming environment capable of communicating with a GPIB compatible instrument.

See Section 4, *The IQ-203 as a GPIB Device*, for detailed information about this configuration.

Integrated Applications Using DDE

The IQ-203 mainframe is built around a Windows operating system on a PC platform.

Windows Dynamic Data Exchange (DDE) provides a communication link permitting bidirectional data sharing between two applications. The block diagram illustrated in Figure 2-3 will help to explain this configuration.

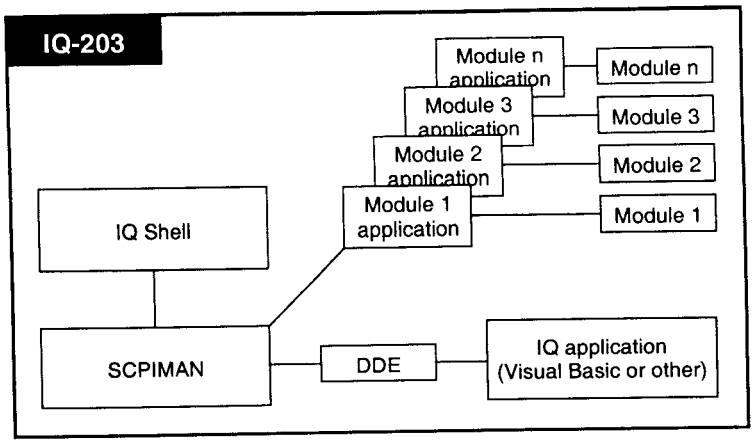

Figure 2-3. IQ Integrated Applications

With reference to the above figure, the integrated IQ Application must open a DDE link with the SCPI Manager. Once this link is open, commands to the modules are routed by the SCPI Manager to the appropriate module control software. Data from the modules is routed through the SCPI Manager and returned back to the calling application.

Integrated IQ-Applications may be created using any programming environment that supports Windows DDE. Visual Basic, Delphi, C++, LabVIEW, and LabWindows/CVI all support this communication protocol. Applications can even be created using programs like Excel or Powerpoint.

Service	ScpiManager
Topic	ScpiDdeServer
Item	Command or Lockout

Table 2-1. DDE Communication Parameters

Note: *LabVIEW drivers are available from EXFO for DDE communication with the IQ-200 Optical Test System.*

IMPORTANT

Even though DDE is a very useful means of communicating with the IQ-200 Optical Test System, EXFO has also developed OLE communication tools that are available as part of the IQ Software Development Kit (IQ-SDK). These tools, based on ActiveX controls, provide an extremely efficient way to control the IQ instruments. If you are programming in an environment that supports ActiveX controls, please call EXFO to find out if the IQ-SDK is suitable for your application.

GPIB Controller

If a GPIB controller card (option I2) is installed in the IQ-203 mainframe, applications integrating IQ-200 system components and GPIB compatible instruments can be installed and executed on the IQ-203. This configuration, shown in Figure 2-4, is known as the IQ-203 Controller configuration.

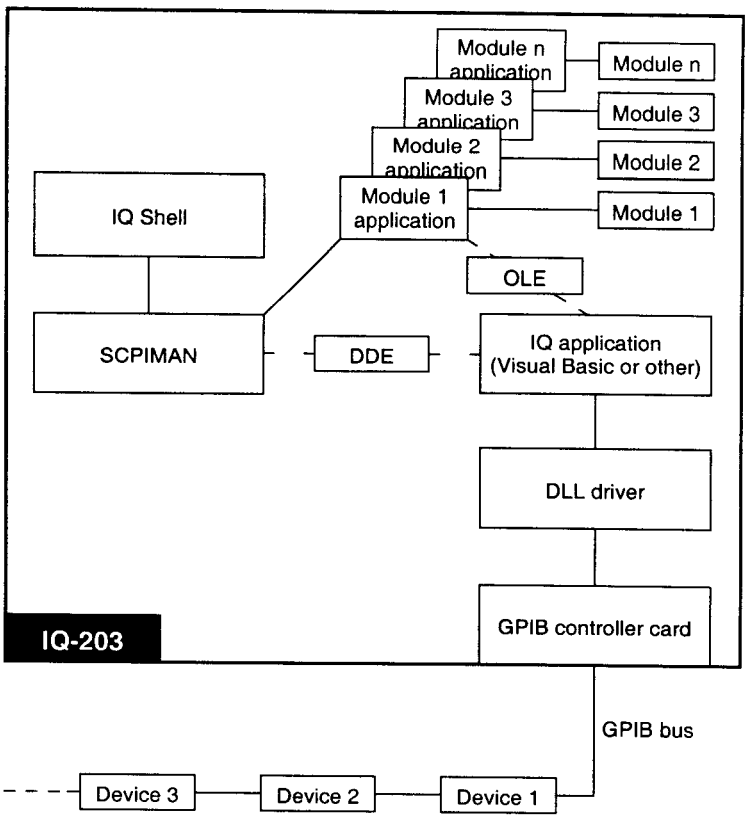

Figure 2-4. *GPIB Controller Configuration*

CAUTION

The GPIB controller card must be installed at the factory. Attempting to install any other GPIB card will void the product warranty.

In this particular setup, the IQ performs the role of system controller, controlling the IQ modules by a DDE link (or OLE link if using the IQ-SDK) and controlling the external GPIB chain using the National Instruments DLL driver and controller card.

Applications can be written using any programming environment that supports both DDE and GPIB communication.

Note: *The GPIB controller card can also be configured as a GPIB device card.*

The IQ-206 PC Expansion Card with the IQ-206

The IQ-206 PC Expansion Card can be installed in any PC AT compatible computer with an empty ISA expansion slot. This card offers the option of connecting an IQ-206 (up to a maximum of 4) to a host computer. A block diagram for this configuration is shown in Figure 2-5.

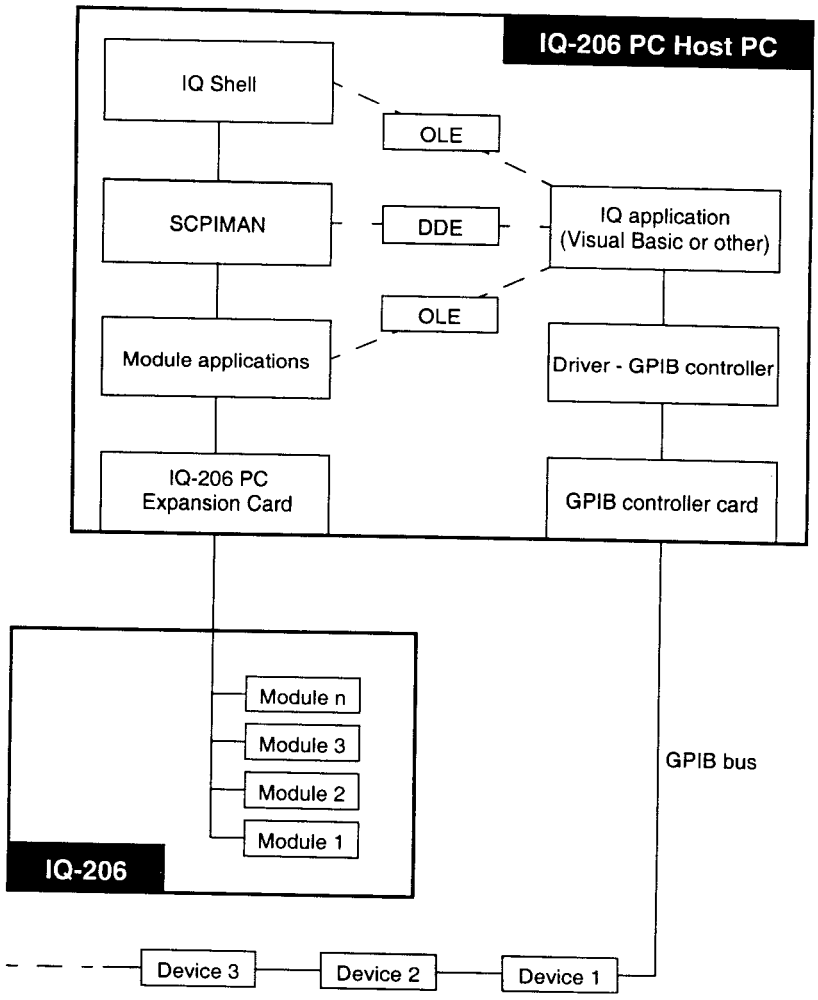

Figure 2-5. IQ-206 with PC Expansion Card

The IQ-206 PC Expansion Card and IQ Software, along with the host computer, emulate the IQ-203 mainframe. Integrated IQ-Applications can be created and executed on the host PC. The application communicates with the SCPI Manager through a DDE link (or OLE if using the IQ-SDK),

which in turn communicates with the IQ module control programs and through the interface card to the modules installed in the IQ-206 Expansion Unit.

With appropriate software and a GPIB controller card installed in the host computer, this setup also permits control of an external GPIB instrument bus. In this case, the application communicates with the IQ modules through the DDE and communicates with the GPIB devices using the GPIB controller interface.

Note: *In this configuration, any modules installed in the IQ-206 are not GPIB instruments. In order to control IQ modules, you must use either a DDE or OLE communiation link.*

Please refer to the documentation supplied with your GPIB controller interface card (not supplied by EXFO for this configuration) for information about programming and controlling GPIB instruments.

3 SCPI Manager

Purpose

The IQ-200 family components are designed to comply with the IEEE-488 and Standard Commands for Programmable Instruments (SCPI) standards. The SCPI standard defines a command structure for all complying instrument manufacturers and ensures a common and easy to read command syntax.

The SCPI Manager program is the interface that provides the link between the IQ-200 Optical Test System modules and any controlling application that supports either a GPIB interface, an RS-232 interface or a Windows Dynamic Data Exchange (DDE) link. The main functions of the SCPI Manager are as follows:

- Maintains communication with the various components of the IQ system
- Keeps track of errors and events
- Validates commands
- Routes commands to the appropriate system component
- Selects between the type of communication—GPIB, RS-232, or DDE

IMPORTANT

The SCPI Manager is designed to fully support the IEEE 488.2 standard for both GPIB and DDE type interfaces. In the DDE mode, the SCPI Manager fully emulates all the standard registers and common commands outlined in Section 7, <Normal bold>SCPI Commands.

The following important concepts regarding the SCPI Manager should be understood:

- The SCPI Manager communicates with the program that controls the module (i.e., the application that is normally used to control a module), and not directly with the module itself.

➤ The SCPI Manager can open only one communication link at a time. Simultaneous communication with both GPIB and DDE or DDE and RS-232 is not supported.

There are SCPI command structures (often referred to as command trees) defined for each of the different IQ modules. These commands are described in detail later in this manual.

Starting the SCPI Manager

In order to control the IQ modules with the GPIB or DDE interface, the SCPI Manager application must be open. The applications for the modules being controlled must also be open.

The SCPI Manager is started by selecting *SCPI Manager* from the **Run** menu in the IQ-200 Optical Test System, as shown in Figure 3-1.

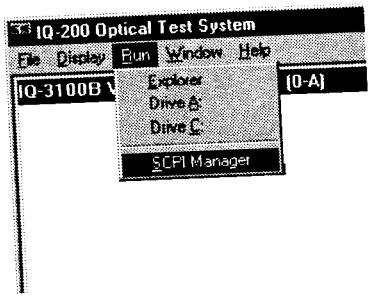

Figure 3-1. *Starting the SCPI Manager*

The SCPI Manager window displaying the current configuration parameters is then displayed.

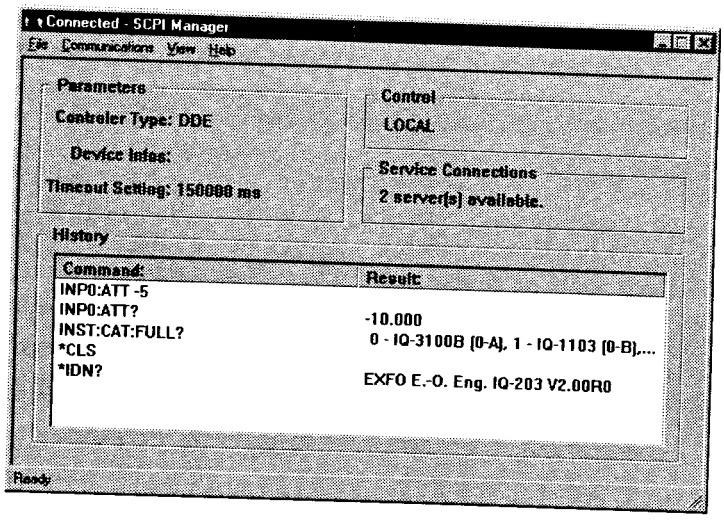

Figure 3-2. SCPI Manager Window

The *Parameters* box displays the current connection type—DDE, GPIB, or RS-232—and, if applicable, the current GPIB address. If the connection type is DDE, the GPIB address is not applicable and is displayed in light gray.

The *Control* box indicates the current control status: Local, Remote, or Remote Lockout. See *Operating Modes* on page 17, for a complete description of the different modes.

The number of active connections (available DDE servers) is also displayed. This value refers to the number of IQ instruments (modules and the IQ-200 Optical Test System) currently in communication with the SCPI Manager.

Note: *The SCPI Manager is always in communication with the IQ-200 Optical Test System. This means that even with no module applications open, there will always be at least one server available. The operating system commands can be used to start module applications.*

An IQ module is in communication with the SCPI Manager if the software application for that module is open. Module applications are opened by pressing the module's LED push-button, by double-clicking the module icon, or by sending the appropriate command to the IQ-200 Optical Test System.

The SCPI Manager window also displays a history of recent commands and error messages.

Note: *It may be convenient to have the SCPI Manager open automatically. This can be easily accomplished by saving the default IQ-200 Optical Test System configuration with the SCPI manager application open.*

Configuring the SCPI Manager

As noted previously, in order to remotely control the IQ system components, the SCPI Manager must be open. However, this does not mean that the SCPI Manager window must always be visible on the IQ system screen. Most of the time the SCPI Manager runs in the background or is minimized.

The following parameters can be modified from within the SCPI Manager:

- Connection type—GPIB or DDE, or RS-232
- GPIB address, 1 to 30 when applicable
- Time-out
- RS-232 protocol parameters
- Termination character (EOS)

All of these parameters are selected from the *Communication Parameters* window, accessed by selecting *Parameters* from the SCPI Manager *Communication* menu.

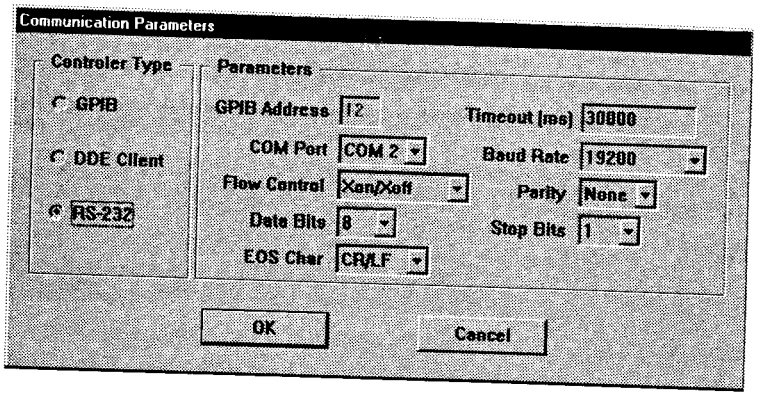

Figure 3-3. SCPI Manager Communications Parameters Window

Depending on the connection type you choose (GPIB, DDE Client, or RS-232), you will need to configure different parameters. The *Timeout* is the maximum time allowed for a module application to reply to a command. If the timeout has expired, a "Device dependent error" is raised in the error list.

Note: *The GPIB connection is used when a GPIB device card is installed in the IQ-203. If a GPIB device card is present, GPIB will be the default communication type. The default GPIB address is 12.*

Operating Modes

Following the IEEE 488 standard, the SCPI Manager supports three operating modes: Local, Remote, and Remote Lockout. The operating mode is sent to and displayed by each module application.

- *Local mode* is the normal operating mode where a module is controlled from its stand-alone software application or using a high level application DDE linked to the SCPI Manager.

- *Remote mode* indicates that the SCPI Manager has been receiving commands from an external controller. Remote mode does permit the user to resume local control. A subsequent remote command will then put the IQ system back in Remote mode.
- *Remote Lockout mode* indicates that a remote application is controlling the SCPI Manager and has enabled the lockout mode. When Remote Lockout is enabled, local control of the instrument is not possible. See GPIB controller documentation for information on how to enable GPIB lockout[1].

Viewing Register Data

The contents of the four primary status and enable registers—Events Enable, Standard Events, Services Enable, and Status Byte—can be viewed by selecting *Summary Registers* from the *View* menu. The screen is similar to the one shown in Figure 3-4.

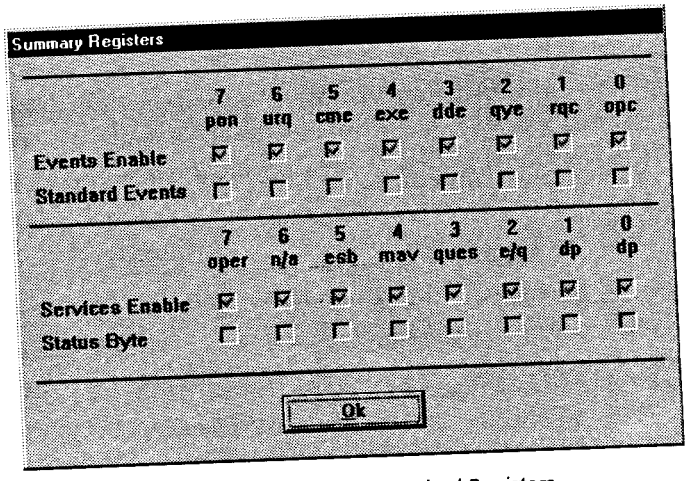

Figure 3-4. Viewing Standard Registers

1. RWLS: remote with lockout state

The significance of each bit in these registers is explained in *Standard Status Data Structure* on page 29. This information may be useful when debugging or troubleshooting.

Other Options

Two options can be selected from the *SCPI Manager Options* window, which is accessible from the *File* menu.

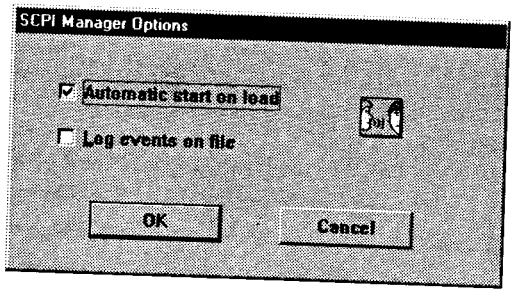

Figure 3-5. *SCPI Manager Options*

- *Automatic start on load* – When selected, the SCPI Manager automatically loads with the IQ Software, allowing communication with the IQ instruments. If it is not selected, the communication is controlled from the *Communications* menu, *Start* and *Stop*. Unless you are having problems or are troubleshooting, we recommend that you leave this item selected.
- *Log events on file* – When selected, all communication events are logged to an EVENTS.LOG file in the sub-directory named "BIN". It is useful to select this option when debugging. By default it is not selected.

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4 The IQ-203 as a GPIB Device

GPIB Capability

The IQ-203 GPIB Device configuration complies to the IEEE 488.2 standard to the extent shown in Table 4-1below.

Code	Function	Capability
SH1	Source handshake	Complete capability
AH1	Acceptor handshake	Complete capability
T6	Talker interface	Basic talker, serial poll, unaddress if MLA, no talk only
L4	Listener interface	Basic listener, unaddress if MTA, no listen only
SR1	Service request	Complete capability
RL1	Remote local	Complete capability
PP0	Parallel poll	No capability
DC1	Device clear	Complete capability
DT1	Device trigger	Accepted but ignored
C0	Controller	No capability
E2	—	Three state output and open collector handshake lines

Table 4-1. IQ-203 GPIB Device Capability

Configuration

The following information describes the GPIB interface driver (IQGPIB.VXD):

- Default GPIB address 12
- Maximum number of IQ-203 on GPIB bus 30
- Input buffer size (circular) 1536 bytes (1.5K)
- Output buffer size (circular) 512 bytes (0.5K)

- Maximum number of messages - Input 20
- Maximum number of messages - Output 20
- Termination character (EOS) 0x0A (line feed)
- Number of bits used - one character 8
- Generate EOI on sending EOS active
- Use of EOS after messages Input, Output
- Command transfer delay None

Getting Started

In order to remotely control the IQ-203 from a host computer, the following items are required:

- IQ-203 c/w option I1 (GPIB Device Card)
- Host computer with GPIB controller card
- GPIB interface cable with standard GPIB connector (P/N GP-130 available from EXFO)
- GPIB application software installed in the host computer

4.1 Establishing GPIB Communication

To initiate GPIB communication with the IQ-203,

1. Connect the IQ-203 to the GPIB bus.
2. Power on the IQ-203.
3. From the IQ-200 Optical Test System *Run* menu, select *SCPI Manager.*
4. As explained in *Configuring the SCPI Manager* on page 16, set the communication type to *GPIB* and select the appropriate GPIB address. The default values are: communication type = GPIB, and GPIB address = 12.

5. From the host computer, send the *ESE 255 and *SRE 255 commands. These two commands set all the bits in both enable registers. See *Standard Status Data Structure* on page 29, for a description of these registers.

The IQ-203 is now ready to receive remote instructions.

IMPORTANT

As mentioned previously, the SCPI manager does not communicate directly with the IQ modules. The SCPI Manager communicates with the executable file (*.exe) that controls the module. For this reason, a module application must be open (may be in background or minimized) when using GPIB control. Module applications may be opened manually (press the LED push-button on the front of the module) or remotely (by sending the INST:STAT command to the IQ-200 Optical Test System).

Programming

Complex measurement programs may be written using any programming environment that supports GPIB communication. GPIB development kits are available for most of the popular commercial programming languages. The IQ-200 Optical Test System offers many commands permitting complete remote control of all the IQ components. These commands adhere to the SCPI standard and are fully explained in *SCPI Commands* on page 29.

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5 Integrated Applications (DDE)

Introduction

As mentioned in *Integrated Applications Using DDE* on page 6, applications can be developed in any programming environment supporting Windows Dynamic Data Exchange (DDE). Applications controlling one or many modules can be created. This offers the user enormous flexibility for customizing a particular module or creating complex custom measurement procedures, without requiring any external communication bus.

DDE is a mechanism supported by most Windows applications that allows two programs to exchange data. A DDE link requires that one application act as server (source) and the other application act as client (destination). As far as the IQ is concerned, the SCPI Manager is the DDE server and the integrated application is the DDE client.

Regardless of the programming environment, commands in the application are sent to the SCPI Manager, interpreted, and dispatched to the appropriate module control software. The response to the commands is returned to the integrated application.

IMPORTANT

It is important to understand that the SCPI Manager does not communicate directly with the IQ modules. The SCPI Manager communicates with the executable file (example IQPM.exe for the IQ-1100 Power Meter) that normally controls the module. For this reason, the module application must be open when controlling an IQ module from a remote location.

Understanding the SCPI standard and the IQ SCPI command format is very important when developing integrated applications. The command format and the specific commands are described in detail in *SCPI Commands* on page 29.

IQ-Applications using the DDE link with the SCPI Manager will run on both the IQ-203 and a host computer with a PC Expansion card connected to an IQ-206.

Opening a DDE Communication Channel

To successfully open a DDE link with the SCPI Manager,

- the IQ Optical Test System software must be open on either the IQ-203 or on a host computer equipped with the IQ-206 PC Expansion Card,
- the SCPI Manager must be open with communication type set to DDE,
- the appropriate link commands must be executed, and
- the SCPI Manager registers must be initialized.

A DDE link for an integrated IQ application can be graphically represented as shown in Figure 5-1.

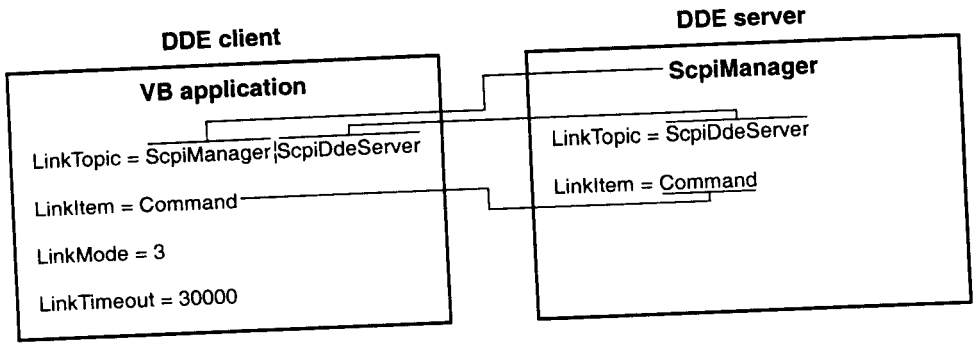

Figure 5-1. *DDE Communication with SCPI Manager*

The DDE protocol is well documented in many books dealing with Windows programming. Even though the basic concepts regarding DDE are similar for all programming languages, there will be, however, different syntax and commands for different languages. Please refer to the documentation provided with your programming language for specific information on programming with DDE.

6 The IQ-203 as a GPIB Controller

Introduction

As pointed out in the overview, the IQ-203 can be equipped with a GPIB controller interface card. In this configuration, the IQ-203 will operate as a fully functioning GPIB Talker/Listener/Controller, while simultaneously controlling the operation of the IQ-200 system components. Integrated applications that control both the external GPIB instruments and the IQ-200 system components can be developed and executed.

Supplied Hardware and Software

The following items are supplied as part of the IQ-203 GPIB Controller option (option I2):

- A National Instruments AT-GPIB/TNT interface board installed in the IQ-203
- NI-488.2 software (AT-GPIB/TNT) for Windows installed on the IQ-203 hard drive
- National Instruments GPIB instruction manuals
- Backup floppy disks containing the NI-488.2 software

CAUTION

The GPIB controller card must be installed at the factory. Attempting to install any other GPIB card will void the product warranty.

Configuration

The NI AT-GPIB interface card installed in the IQ-203 is preset for the following configuration:

- Primary address 2A0h
- IRQ 5 on IQ (Pentium), IRQ 11 on IQ (486)
- No DMA

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7 SCPI Commands

Standard Status Data Structure

Figure 7-1 on page 30 illustrates the four common Status and Enable registers as defined by IEEE 488.2. This diagram is a useful aid in understanding the general commands and how a service request (SRQ) is generated. The four registers are:

- Standard Event Status Register (ESR)
- Standard Event Status Enable Register (ESE)
- Status Byte Register (STB)
- Service Request Enable Register (SRE)

Bit	ESR	ESE	STB	SRE
0	Operation Complete	Operation Complete	Source Status	Source Status
1	Request Control	Request Control	N/A	N/A
2	Query Error	Query Error	Error Bit	Error Summary Bit
3	Device Dependent Error	Device Dependent Error	Questionable Status	Questionable Status
4	Execution Error	Execution Error	Message Available	Event Status Summary Bit
5	Command Error	Command Error	Event Status Summary Bit	Message Available
6	User Request	User Request	Master Summary Status	Request Service / Master Summary Status
7	Power On	Power On	Operation Status	Operation Status

Table 7-1. Standard Registers

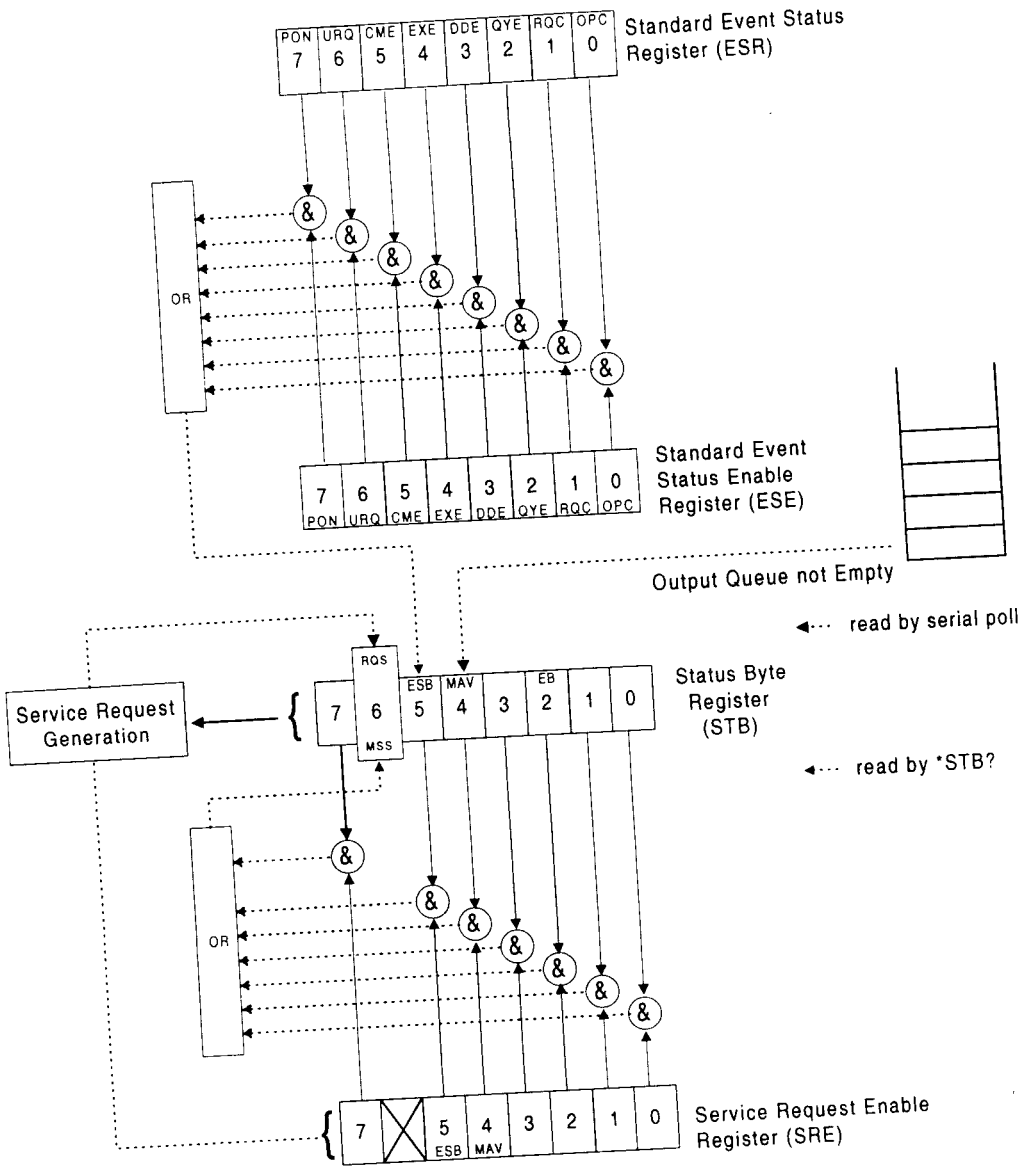


Figure 7-1. Standard Status Data Structures (IEEE 488.2)

An SRQ is forced when a bit is set in the STB and at the same time the corresponding SRE bit is set. When the SRQ is generated, the RQS bit is set to 1, and remains set until read by a serial poll. Once the RQS is read, it returns to 0.

General Commands

The SCPI Manager recognizes all of the general commands identified as mandatory by IEEE 488.2. These commands, as well as some optional general commands, and the programming state commands, are summarized in Table 7-2.

Command	Function
*CLS	Clear status command
*ESE	Standard event status enable command
*ESE?	Standard event status enable query
*ESR?	Standard event status register query
*IDN?	Identification query
*LOK	Set Remote Lockout programming state
*OPC	Operation complete command
*OPC?	Operation complete query
*REM	Set Remote programming state
*RST	Reset command
*SRE	Service request enable command
*SRE?	Service request enable query
*STB?	Read status byte query
*TST?	Self test query

Table 7-2. General Commands Summary

These commands are fully explained hereafter.

*CLS

Description This command sets the contents of the Standard Event Register (ESR), the Status Byte Register (STB), and the Error Queue (ERR) to zero. This command is commonly used to clear the status registers before enabling SRQ. Note that the output queue, Standard Event Status Enable Register (ESE), and Service Request Enable Register (SRE) are not affected.

Syntax *CLS

*ESE

Description This command is used to set bits in the Standard Event Status Enable Register (ESE) to a new value (initial value is 255). The contents of the ESE register are logically ANDed with the ESR register. A non zero result will set the Event Summary Bit (ESB) of the Status Byte Register (STB). This command is useful for selecting which events may generate an SRQ.

Syntax *ESE<space><value>

Parameter The <value> parameter must be between 0 and 255.

*ESE?

Description This query reads the contents of the Standard Event Status Enable Register (ESE).

Syntax *ESE?

Response A binary integer between 0 and 255.

*ESR?

Description This query reads the contents of the Standard Event Status Register (ESR).

Syntax *ESR?

Response A binary integer between 0 and 255.

*IDN?

Description This query reads the IQ system identification string.

Syntax *IDN?

Response "EXFO E.-O. Eng. IQ-200 OTS Vxx.xx", where xx.xx is the current product version.

*LOK

Description This command is used to set the Remote Lockout programming state.

Syntax *LOK<space><data>

Parameters The <data> parameter can be "1" to set the Remote programming state to Remote Lockout or "0" to set the Remote programming state to Remote.

*OPC

Description This command will cause the SCPI Manager to generate the "Operation complete" message in the Standard Event Status Register (ESR) when all pending selected SCPI Manager's operations have been completed.

Syntax *OPC

Example *OPC;*IDN?

*OPC?

Description This query puts an ASCII 1 in the output queue when the content of the input queue has been processed. This query is useful to prevent another command from being processed until the current command is complete.

Syntax *OPC?

Response "1"

*REM

Description This command is used to set the Remote programming state.

Syntax *REM<space><data>

Parameters The <data> parameter can be "1" to set the Remote programming state to Remote or "0" to set the Remote progamming state to Local.

*RST

Description This command empties the step response list. It is only seen when it is part of another multiple command. In the example below, by adding this command after *IDN?, you will not be able to access the answer. The *RST, in this instance, erases the identification string. In addition, this command performs the following operations:

1. Return to initial state before command was sent and not necessarily to previous settings.
2. Force the device to enter into an Operation Complete Command Idle State (OCIS).
3. Force the device to enter into an Operation Complete Query Active State (OQAS).
4. Initialize previous responses unless there has been a program message terminator preceded by an *RST.

Syntax *RST

Example *IDN?;*RST<NL>

*SRE

Description This command sets bits in the Service Request Enable Register (SRE; initial value is 255), and enables the corresponding bit in the Status Byte Register (STB). The command can be used to select which events can initiate a service request.

Syntax *SRE<space><value>

Parameter The <value> parameter must be between 0 and 255.

*SRE?

Description This query returns the contents of the Service Request Enable Register (SRE).

Syntax *SRE?

Response A binary integer between 0 and 255.

*STB?

Description This query returns the contents of the Status Byte Register (STB).

Syntax *STB?

Response A binary integer between 0 and 255.

*TST?

Description This query initiates an internal self-test and returns a binary value indicating the results of the test. If an error occurs, it is possible to return the error using the SYST:ERR? query.

Syntax *TST?

Response A binary value:
"0" -test is complete with no errors
"1" -test is complete with errors

System Commands

STATus:OPERation:CONDition?

Description This query returns the value of the CONDITION register in the OPERATION node.

Syntax STAT:OPER:COND?

Response A binary integer between 0 and 65 536.

STATus:OPERation:ENABle

Description This command resets the value of the ENABLE register for the OPERATION node.

Syntax STAT:OPER:ENAB<space><numeric>

Parameters The <numeric> parameter must be between 0 and 65 536.

STATus:OPERation:ENABle?

Description This query returns the value of the ENABLE register for the OPERATION node.

Syntax STAT:OPER:ENAB?

Response A binary integer between 0 and 65 536.

STATus:OPERation:EVENt?

Description This query returns the value of the EVENT register in the OPERATION node. The STAT:OPER? query gives the same result.

Syntax STAT:OPER:EVEN?

Response A binary integer between 0 and 65 536.

STATus:OPERation:NTR

Description This command resets the value of the NEGATIVE TRANSITION register for the OPERATION node.

Syntax STAT:OPER:NTR<space><numeric>

Parameters The <numeric> parameter must be between 0 and 65 536.

STATus:OPERation:NTR?

Description This query returns the value of the NEGATIVE TRANSITION register for the OPERATION node.

Syntax STAT:OPER:NTR?

Response A binary integer between 0 and 65 536.

STATus:OPERation:PTR

Description This command resets the value of the POSITIVE TRANSITION register for the OPERATION node.

Syntax STAT:OPER:PTR<space><numeric>

Parameters The <numeric> parameter must be between 0 and 65 536.

STATus:OPERation:PTR?

Description This query returns the value of the POSITIVE TRANSITION register for the OPERATION node.

Syntax STAT:OPER:PTR?

Response A binary integer between 0 and 65 536.

STATus:PRESet

Description This command sets all the registers for all the nodes to a default value.

Syntax STAT:PRES<space><numeric>

Parameters The <numeric> parameter must be between 0 and 65 536.

STATus:QUEStionable:CONDition?

Description This query returns the value of the CONDITION register for the QUESTIONABLE node.

Syntax STAT:QUES:COND?

Response A binary integer between 0 and 65 536.

STATus:QUEStionable:ENABle

Description This command resets the value of the ENABLE register for the QUESTIONABLE node.

Syntax STAT:QUES:ENAB<space><numeric>

Parameters The <numeric> parameter must be between 0 and 65 536.

STATus:QUEStionable:ENABle?

Description This query returns the value of the ENABLE register for the QUESTIONABLE node.

Syntax STAT:QUES:ENAB?

Response A binary integer between 0 and 65 536.

STATus:QUEStionable:EVENt?

Description This query returns the value of the EVENT register for the QUESTIONABLE node.

Syntax STAT:QUES:EVEN?

Response A binary integer between 0 and 65 536.

STATus:QUEStionable:NTR

Description This command resets the value of the NEGATIVE TRANSITION register for the QUESTIONABLE node.

Syntax STAT:QUES:NTR<space><numeric>

Parameters The <numeric> parameter must be between 0 and 65 536.

STATus:QUEStionable:NTR?

Description This query returns the value of the POSITIVE TRANSITION register for the QUESTIONABLE node.

Syntax STAT:QUES:NTR?

Response A binary integer between 0 and 65 536.

STATus:QUEStionable:PTR

Description This command resets the value of the POSITIVE TRANSITION register for the QUESTIONABLE node.

Syntax STAT:QUES:PTR<space><numeric>

Parameters The <numeric> parameter must be between 0 and 65 536.

STATus:QUEStionable:PTR?

Description This query returns the value of the POSITIVE TRANSITION register for the QUESTIONABLE node.

Syntax STAT:QUES:PTR?

Response A binary integer between 0 and 65 536.

SYSTem:ERRor?

Description This command returns the next error in the list. When an error is generated, an error number is sent to the error list. The error list is accessed with the SYST:ERR? query. If the list contains 20 errors and a new error occurs, the first error will be erased.

Syntax SYST:ERR?

Response See error list and descriptions in *Error Messages* on page 377.

SYSTem:VERSion?

Description This query returns the current system software version.

Syntax SYST:VERS?

Response "EXFO E.-O. Eng. IQ-200 OTS Vxx.xx", where xx.xx is the current product version.

IQ-200 Command Structure

The IQ-200 commands follow the guidelines determined by the Standard Commands for Programmable Instruments (SCPI) consortium. Due to the modular nature of the IQ-200 product family, the command format is, however, slightly modified so that specific modules in the system may be addressed.

The IQ-203, connected to 4 IQ-206 expansion units, may accommodate a maximum of 27 modules. These modules may be the same type (e.g., 27 source modules) or they may be different modules. The SCPI commands for the IQ modules incorporate a module address modifier at the end of the command subsystem identifier to specify a particular module. For example, the command syntax:

FORM(0..26):READ[:DATA]<space><digits>

is used to change the measurement display resolution (number of digits after the decimal point) for an IQ-1100 Power Meter.

In this particular example,

- FORM identifies that the command is a part of the SCPI FORMat subset of commands
- (0..26) is the module address modifier and identifies the specific module to which the command is addressed

Note: *Commands sent to the IQ Optical Test System do not require the address modifier.*

- READ and DATA are keywords that define the function of the command
- [ ] indicates that a keyword or a parameter is optional
- <space> is included to indicate that a space is required
- <digits> is the command parameter
- Keywords must be separated by a colon

For example, the typical command FORM2:READ:DATA 1 instructs the module located in IQ position 2, to display a power measurement with 1 digit after the decimal point.

Note: *It is recommended that you retrieve the response immediately after each query.*

Module SCPI Command Address

As previously mentioned, the IQ-200 system can accommodate up to 27 modules. This maximum configuration is shown in Figure 7-2 on next page. The physical location and the module SCPI command address of each module is shown in the diagram.

Note: *When using the IQ-206 Expansion Unit and the IQ-200 PC Expansion Card connected to a host computer, modules 0, 1, and 2 do not exist. The module located in slot A of the first IQ-206 (1-A) is addressed as module 3 with the rest of the modules following in sequence. The 0, 1, and 2 addresses are reserved for modules installed in the IQ-203 Mainframe.*

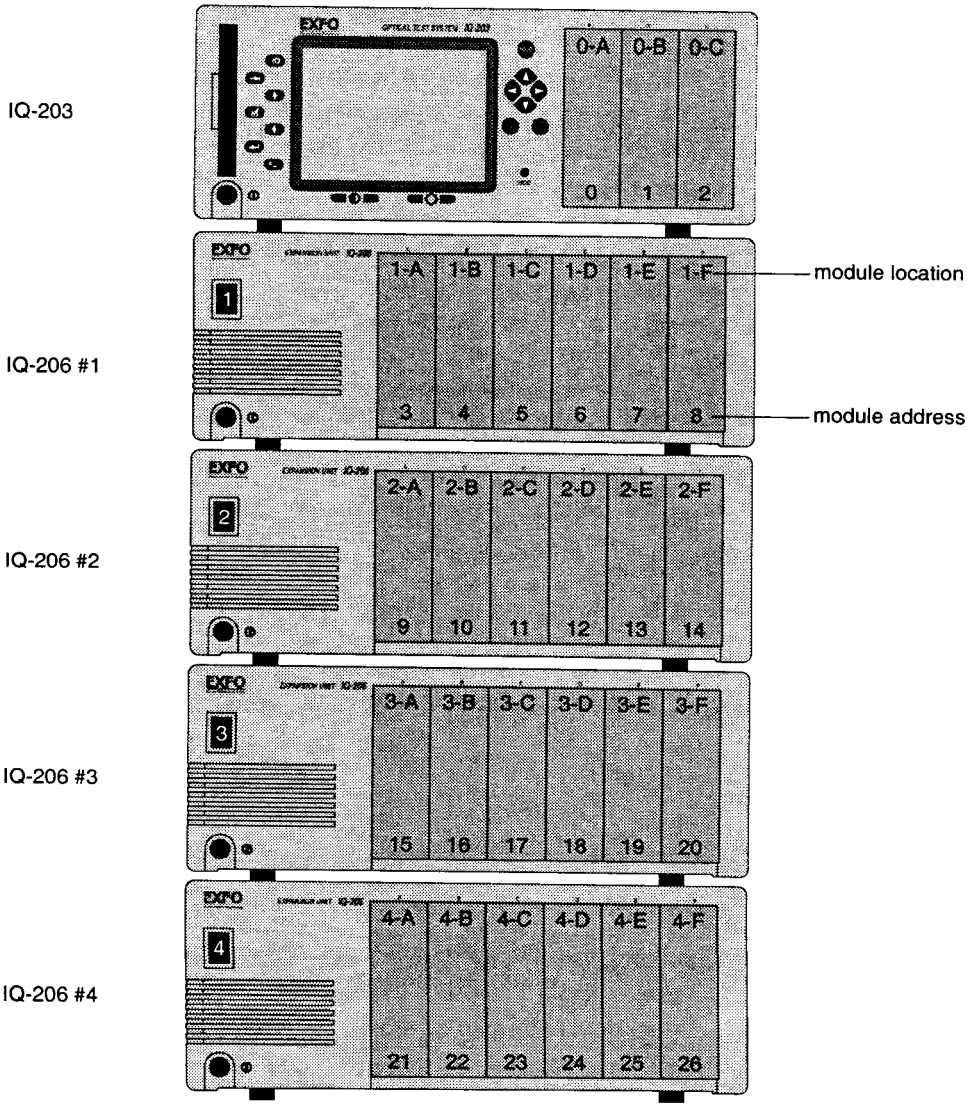


Figure 7-2. *IQ-200 Module Addresses*

IQ-200 Optical Test System Commands

The following commands are addressed to the IQ operating system, otherwise known as the IQ Optical Test System. It should be noted that these commands do not require the command address modifier.

INSTrument:CATalog?

Description This query returns a list of strings identifying the available modules with their model numbers and physical locations. The list is separated by commas.

Syntax INST:CAT?

Response A list of strings identifying both the model number and physical location of the available modules. For example, "0-IQ-2123-BLC (0-A),1-IQ-1103 (0-B)" as return means that a dual wavelength Fabry-Perot source is located in the first slot of the IQ-203 and a single-channel InGaAs power meter is located in the second slot of the IQ-203. For information on physical location number conventions, see *Module SCPI Command Address* on page 43.

Example INST:CAT?

INSTrument:CATalog:FULL?

Description This query returns a list of strings identifying the available modules with their address number, model numbers, and physical locations. The list is separated by commas.

Syntax INST:CAT:FULL?

Response A list of strings identifying the address number, model number, and physical location of the available modules. For example, "0-IQ-2123-BLC (0-A),1-IQ-1103 (0-B)" as return means that a dual wavelength Fabry-Perot source is located in the first slot of the IQ-203 and a single-channel InGaAs power meter is located in the second slot of the IQ-203. For information on address and physical location number conventions, see *Module SCPI Command Address* on page 43.

Example INST:CAT:FULL?

INSTrument:STATe

Description This command opens or closes the software application that is required to operate a specific module.

Syntax INST:STAT<space><boolean>,<address>

Parameters The <boolean> parameter is:
"1" or "ON" -open the application
"0" or "OFF" -close the application
The <address> parameter is a number (0 to 26) matching the module logical number.

Example INST:STAT 1,1 would activate the application for the module located in the second slot of the IQ-203.

Note A 5 second delay minimum should be added after sending this command to allow the application to be loaded, before sending new commands to the matching module. If the next command is not destined for this module, no delay is required.

INSTrument:STATe?

Description This query returns a value indicating whether the application for a specific module is open or closed.

Syntax INST:STAT?<space><address>

Parameters The <address> parameter is a number (0 to 26) matching the module logical number (see Figure 7-2).

Response A value indicating whether the specified application is open:
"1" -the application is open
"0" -the application is closed

Example INST:STAT? 1

SHELl:DATE

Description This command sets the IQ system date.

Syntax SHEL:DATE<space><YYYY>,<MM>,<DD>

Parameters The <YYYY> parameter represents the year.
The <MM> parameter represents the month (01 to 12).
The <DD> parameter represents the day (01 to 31).

Example SHEL:DATE 1999,11,02

SHELl:DATE?

Description This query returns the IQ system date.

Syntax SHEL:DATE?

Response The IQ system date in the "MM/DD/YY" format, where:
"MM" represents the month
"DD" represents the day
"YY" represents the year

Example SHEL:DATE?

SHELI:LIGHt

Description This command turns off or on the IQ-203/IQ-206 front panel lights, including the integrated VGA display and the module LED push buttons. The external monitor and keyboard are not affected by this command.

Syntax SHEL:LIGH<space><boolean>

Parameters The <boolean> parameter can be:
"1" or "ON" -turn on the front panel lights
"0" or "OFF" -turn off the front panel lights

Example SHEL:LIGH OFF

SHELI:LIGHt?

Description This query returns the state of the IQ system front panel lights (on or off).

Syntax SHEL:LIGH?

Response A boolean value:
"1" -the front panel lights are on
"0" -the front panel lights are off

Example SHEL:LIGH?

SHELI:TIME

Description This command sets the IQ system time (24 hour format).

Syntax SHEL:TIME<space><HH>,<MM>,<SS>

Parameters The <HH> parameter represents the hours.
The <MM> parameter represents the minutes.
The <SS> parameter represents the seconds.

Example SHEL:TIME 14,23,00

SHELl:TIME?

Description This query returns the IQ system time (24 hour format).

Syntax SHEL:TIME?

Response The IQ system time in the "HH:MM:SS" format, where:
"HH" represents the hours (24 hour format).
"MM" represents the minutes.
"SS" represents the seconds.

Example SHEL:TIME?

IQ Power Meter Series Commands

These commands are applicable to all IQ power meters, including the IQ-1100 single-channel, IQ-1200 4-channel, and the IQ-1500 Calibration Power Meter modules.

ABORt

Description This command stops any measurement in progress. For the IQ-1200 4-Channel Power Meter, this command stops the measurement on all 4 channels.

Syntax ABOR(0..26)

Example ABOR4

FETCh[:SCALar]:POWer:DC?

Description This query returns the stored value (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax FETC(0..26)[:SCAL]:POW:DC?

Response A power measurement in the "±999.999E±99" exponential format in the currently selected unit. The number of digits after the decimal point depends on the selected resolution. To know the current measurement unit, use the SENS:POW:UNIT? query.

Example FETC4:SCAL:POW:DC?

See also INIT:CONT, INIT:CONT?, INIT[:IMM], and READ:SCAL:POW:DC?

FORMat:READings[:DATA]

Description This command changes the resolution of the displayed power value, when dB or dBm is selected (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax FORM(0..26):READ[:DATA]<space><digits>

Parameters The <digits> parameter can be:
"0" -zero digit after the decimal point
"1" -one digit after the decimal point
"2" -two digits after the decimal point
"3" -three digits after the decimal point
"4" -autoresolution, determined by the measured power level

Example FORM4:READ:DATA 3

INITiate:CONTinuous

Description This command starts or stops continuous power measurements (for all channels if using the IQ-1200 4-Channel Power Meter).

Syntax INIT(0..26):CONT<space><boolean>

Parameters The <boolean> value refers to:
"0" -stop measurements
"1" -start measurements

Example INIT4:CONT 1

See also FETC:SCAL:POW:DC?, INIT:CONT?, INIT[:IMM], and READ:SCAL:POW:DC?

INITiate:CONTinuous?

Description This query returns a value indicating whether continuous power measurements are in progress (for all channels if using the IQ-1200 4-Channel Power Meter).

Syntax INIT(0..26):CONT?

Response "0" -stopped
"1" -started

Example INIT4:CONT?

See also FETC:SCAL:POW:DC?, INIT:CONT, INIT[:IMM], and READ:SCAL:POW:DC?

INITiate[:IMMediate]

Description This command stores a power measurement value (for all channels if using the IQ-1200 4-Channel Power Meter).

Syntax INIT(0..26)[:IMM]

Example INIT4:IMM

See also FETC:SCAL:POW:DC?, INIT:CONT, INIT:CONT?, and READ:SCAL:POW:DC?

INSTrument:NSELect

Description This command selects a power meter channel when using the IQ-1200 4-Channel Power Meter. Until a new channel is selected, any subsequent commands will be directed to this channel. This command is specific to the IQ-1200 4-Channel Power Meter. An error message appears if the command is sent to a single-channel power meter.

Syntax INST(0..26):NSEL<space><numeric_value>

Parameters The <numeric_value> parameter can be 1, 2, 3, or 4.

Example INST4:NSEL 4

MMEMory:ACQuisition

Description This command initiates a data acquisition. Acquisition data, at the selected sampling rate, will be recorded to the system hard disk in C:\IQ\USERFILE\<IQ1X00>\GPIBPM##.DAT, where X stands for "1", "2", or "5" depending on the power meter and ## is the logical module number (0..26). The acquisition will continue for 9999 hours, 59 minutes, and 59 seconds or until an acquisition stop (MMEM:ACQ 0) command is transmitted.

Syntax MMEM(0..26):ACQ<space><boolean>

Parameters The <boolean> acquisition can be:
"1" -start the data acquisition
"0" -stop the data acquisition

Example MMEM4:ACQ 1

MMEMory:ACQuisition?

Description This query returns a value indicating whether a data acquisition is in progress.

Syntax MMEM(0..26):ACQ?

Response The response is in the format:
"1" -data acquisition is in progress
"0" -data acquisition is not in progress

Example MMEM4:ACQ?

READ[:SCALar]:POWer:DC?

Description This query performs an initiate and fetch (for the selected channel when using the IQ-1200 4-Channel Power Meter). A measurement value is stored and returned.

Syntax READ(0..26)[:SCAL]:POW:DC?

Response A power measurement in the "±999.999E±99" exponential format in the currently selected unit. The number of digits after the decimal point depends on the selected resolution.

Example READ4:SCAL:POW:DC?

See also FETC:SCAL:POW:DC?, INIT:CONT, INIT:CONT?, and INIT[:IMM]

READ[:SCALar]:POWer:MODE

Description This command activates or deactivates the validation mode for power readings when automatically adjusting the power scale. This command applies to the IQ-1200 only.

Syntax READ(0..26)[:SCAL]:POW:MODE<space><numeric>

Parameters The <numeric> parameter represents the validation mode:
"0" = deactivate the validation mode
"1" = activate the validation mode.

Note When the validation mode is activated, it ensures that the power readings do not match an unstable power value while automatically adjusting the power scale. When it is deactivated, it is possible to receive unstable power readings.

Example READ4:SCAL:POW:MODE 1

READ[:SCALar]:POWer:MODE?

Description This query returns the state of the validation mode of power readings in scale adjustments (IQ-1200 only).

Syntax READ(0..26)[:SCAL]:POW:MODE?

Response A boolean value:
"0" = validation mode deactivated
"1" = validation mode activated

Example READ4:SCAL:POW:MODE?

SENSitivity:AVERage[:STATe]

Description This command activates or deactivates data averaging. It is specific to the IQ-1100 Single-Channel Power Meter.

Syntax SENS(0..26):AVER[:STAT]<space><boolean>

Parameters The <boolean> parameter can be:
"0" -disable averaging
"1" -enable averaging

Example SENS4:AVER:STAT 1

SENSitivity:AVERage:STATe?

Description This query returns a value indicating whether data averaging is enabled or disabled. It is specific to the IQ-1100 Single-Channel Power Meter.

Syntax SENS(0..26):AVER:STAT?

Response "0" -averaging is disabled
"1" -averaging is enabled

Example SENS4:AVER:STAT?

SENSitivity:CORRection:COLLect:ZERO

Description This command performs an offset nulling measurement (for the selected channel when using the IQ-1200 4-Channel Power Meter). If light is detected, the "Light on detector" error message appears.

Syntax SENS(0..26):CORR:COLL:ZERO[<space>ALL]

Parameters The optional <ALL> parameter will perform the NULL on all four channels of the IQ-1200.

Example SENS4:CORR:COLL:ZERO

SENSitivity:CORRection:OFFSet[:MAGNitude]

Description This command sets an offset value that is applied when dB or dBm is selected (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):CORR:OFFS[:MAGN]
<space><numeric_value>
[<space>DB]

Parameters The <numeric_value> parameter is an offset in dB.
-99.999 ≤ numeric_value ≤ 99.999 (dB). If an invalid parameter is entered, the "Data type error" message appears.

Example SENS4:CORR:OFFS:MAGN 22.105

SENSitivity:FREQuency

Description This command selects a data sampling rate.

Syntax SENS(0..26):FREQ<space><numeric_value>[<space>HZ]

Parameters The <numeric_value> parameter is the sampling rate in sec^{-1}:

0.1, 0.5, 1.0, 5.0, 10.0, 20.0, or 40.0	IQ-1100
2.5	IQ-1200
0.1, 0.5, 1.0, 2.0, or 5.0	IQ-1500

If an invalid parameter is entered, the "Data type error" message appears.

Note On an IQ-1500, the sampling rate can be modified only in Normal mode and not in Calibration mode. On an IQ-1200, the sampling rate cannot be modified.

Example SENS4:FREQ 1

SENSitivity:FREQuency?

Description This query returns the current sampling rate.

Syntax SENS(0..26):FREQ?

Response Returns the current sampling rate in samples per second:

0.1, 0.5, 1.0, 5.0, 10.0, 20.0, or 40.0	IQ-1100
2.5	IQ-1200
0.1, 0.5, 1.0, 2.0, or 5.0	IQ-1500

Example
SENS4:FREQ?
5.0

SENSitivity:FREQuency:CATalog?

Description This query returns a list of available sampling rates.

Syntax SENS(0..26):FREQ:CAT?

Response List of available sampling rates in the format:

0.1, 0.5, 1.0, 5.0, 10.0, 20.0 or 40.0	IQ-1100
2.5	IQ-1200
0.1, 0.5, 1.0, 2.0 or 5.0	IQ-1500

Example SENS4:FREQ:CAT?

SENSitivity:POWer:REFerence?

Description This query returns the reference power for the current wavelength (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):POW:REF?

Response Current reference value in dBm, which can be any value within the power range of the power meter in the "99.999 dBm" format.

Example SENS4:POW:REF?
49.428 dBm

SENSitivity:POWer:REFerence:DISPlay

Description This command performs a new reference measurement for the current wavelength and changes the display to read relative power (dB) (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):POW:REF:DISP

Example SENS4:POW:REF:DISP

SENSitivity:POWer:REFerence:STATe

Description This command selects whether absolute (dBm) or relative power measurements are performed (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):POW:REF:STAT<space><boolean>

Parameters The <boolean> value represents either dB or dBm:
"0" -select absolute or dBm
"1" -select relative or dB

Example SENS4:POW:REF:STAT 0

SENSitivity:POWer:REFerence:STATe?

Description This query returns a value indicating whether the power meter is displaying absolute (dBm) or relative power values (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):POW:REF:STAT?

Response "0" -absolute mode (dBm or watt)
"1" -relative mode (dB)

Example SENS4:POW:REF:STAT?

SENSitivity:POWer:UNIT

Description This command changes the absolute measurement display unit: dBm or watts (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):POW:UNIT<space><value>

Parameters The <value> parameter can be:
"DBM" or "0" -set power display to dBm
"W" or "1" -set power display to W units (pW, nW, μW, mW)

Example SENS4:POW:UNIT DBM

See also SENS:POW:UNIT? and UNIT:POW

SENSitivity:POWer:UNIT?

Description This query returns the current absolute power measurement display unit (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):POW:UNIT?

Response "0" -current unit is dBm
"1" -current unit is W (pW, nW, µW, or mW)

Example SENS4:POW:UNIT?

See also SENS:POW:UNIT and UNIT:POW

SENSitivity:POWer:WAVelength

Description This command selects a new operating wavelength (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):POW:WAV<space><numeric_value>
[<space>NM]

Parameters The <numeric_value> parameter is an operating wavelength in nm. Any wavelength within spectral range of the power meter optical detector at 1 nm resolution (0.1 nm for the IQ-1500 Calibration Power Meter) may be selected. See the power meter instruction manual for the exact spectral range for each detector type. An invalid parameter will raise a "Data type error" message.

Example SENS4:POW:WAV 1310

SENSitivity:POWer:WAVelength?

Description This query returns the currently selected calibrated wavelength (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax SENS(0..26):POW:WAV?

Response The current wavelength in nanometers (nm) in the "9999 nm" format (9999.9 for the IQ-1500). See the power meter instruction manual for the exact spectral range for each detector type.

Example SENS4:POW:WAV?
1310 nm

UNIT:POWer

Description This command changes the measurement unit (for the selected channel when using the IQ-1200 4-Channel Power Meter).

Syntax UNIT(0..26):POW<space><value>

Parameters The <value> parameter can be:
"DB" or "0" -set measurement unit to dB
"DBM" or "1" -set measurement unit to dBm
"W" or "2" -set measurement unit to W (pW, nW, μW, mW)

Example UNIT4:POW DBM

See also SENS:POW:UNIT and SENS:POW:UNIT?

IQ-1600 High-Speed Power Meter Commands

These commands are applicable to the IQ-1610 Single-Channel, the IQ-1620 Dual-Channel, and the IQ-1640 Four-Channel power meter modules.

ABORt

Description This command stops any measurement in progress in Continuous mode, on all channels when using a multi-channel high-speed power meter.

Syntax ABOR(0..26)

Example ABOR3

FETCh[:SCALar]:POWer:DC?

Description This query returns the stored value (for the selected channel when using a multi-channel high-speed power meter).

Syntax FETC(0..26)[:SCAL]:POW:DC?

Response A power measurement in the "±999.9999E±99" exponential format in the currently selected unit. The number of digits after the decimal point depends on the selected resolution. To change the resolution of the displayed power value in dB or dBm, use the FORM:READ[:DATA] command. To know the current measurement unit, use the SENS:POW:UNIT? query.

Example FETC3:SCAL:POW:DC?

See also INIT:CONT, INIT:CONT?, INIT[:IMM], and READ[:SCAL]:POW:DC?

FORMat:READings[:DATA]

Description This command changes the resolution of the power value when dB or dBm is selected (for the selected channel when using a multi-channel high-speed power meter).

Syntax FORM(0..26):READ[:DATA]<space><digits>

Parameters The <digits> parameter can be:
"0" -zero digit after the decimal point
"1" -one digit after the decimal point
"2" -two digits after the decimal point
"3" -three digits after the decimal point
"4" -four digits after the decimal point
"5" -auto-resolution, determined by the measured power level

Example FORM3:READ:DATA 3

INITiate:AUTOstop

Description This command starts or stops an acquisition using the number of points set with the TRAC:POIN command, and the sampling rate set with the SENS:FREQ[:CONT] or the SENS:FREQ:NCON commands.

Syntax INIT(0..26):AUTO<space><boolean>[,<value>]

Parameters The <boolean> value refers to:
"0" -stop acquisition
"1" -start acquisition
The optional <value> parameter can be:
"CONT" or "0" -set Continuous acquisition rate
"NCON" or "1" -set Single acquisition rate.
The <value> parameter is considered only when starting an acquisition. If the <value> parameter is absent, the acquisition starts in Continuous mode by default.

Example INIT3:AUTO: 1,CONT

See also ABOR, INIT:AUTO:NCON, INIT:CONT, INIT:CONT?, INIT[:IMM], and TRAC:POIN

INITiate:AUTOstop?

Description This query returns a value indicating whether a programmed (or "Autostop") acquisition is in progress.

Syntax INIT(0..26):AUTO?

Response "0" -Autostop acquisition is off
"1" -Autostop acquisition is on

Example INIT3:AUTO?

See also ABOR, INIT:AUTO, INIT:CONT, INIT:CONT?, INIT[:IMM], and TRAC:POIN

INITiate:CONTinuous

Description This command starts or stops power measurements (for all channels when using a multi-channel high-speed power meter) in Continuous mode.

Syntax INIT(0..26):CONT<space><boolean>

Parameters The <boolean> value refers to:
"0" -stop measurements
"1" -start measurements

Example INIT3:CONT 1

See also FETC[:SCAL]:POW:DC?, INIT:CONT?, INIT[:IMM], and READ[:SCAL]:POW:DC?

INITiate:CONTinuous?

Description This query returns a value indicating whether power measurements are in progress (for all channels when using a multi-channel high-speed power meter) in Continuous mode.

Syntax INIT(0..26):CONT?

Response "0" -measurements stopped
"1" -measurements started

Example INIT3:CONT?

See also FETC[:SCAL]:POW:DC?, INIT[:IMM], and READ[:SCAL]:POW:DC?

INITiate:EXTRema

Description This command starts or stops Min/Max power measurements in Continuous acquisition mode (for all channels when using a multi-channel high-speed power meter).

Syntax INIT(0..26):EXTR<space><boolean>

Parameters The <boolean> value refers to:
"0" -stop Min/Max measurements
"1" -start Min/Max measurements

Example INIT3:EXTR 1

INITiate:EXTRema?

Description This query returns a value indicating whether Min/Max power measurements are in progress in Continuous acquisition mode (for all channels when using a multi-channel high-speed power meter).

Syntax INIT(0..26):EXTR?

Response "0" -Min/Max measurements are stopped
"1" -Min/Max measurements in progress

Example INIT3:EXTR?

INITiate[:IMMediate]

Description This command stores a power measurement value (for all channels when using a multi-channel high-speed power meter).

Syntax INIT(0..26)[:IMM]

Example INIT3:IMM

See also FETC[:SCAL]:POW:DC? and READ[:SCAL]:POW:DC?

INST:NSELect

Description This command selects a power meter channel (when using a multi-channel high-speed power meter). Until a new channel is selected, any subsequent commands will be directed to this channel. An error message appears if the command is sent to a single-channel power meter.

Syntax INST(0..26):NSEL<space><numeric_value>

Parameters The <numeric_value> parameter can be 1, 2, 3, or 4.

Example INST3:NSEL 4

INST:NSELect?

Description This query returns the currently selected power meter channel (when using a multi-channel high-speed power meter).

Syntax INST(0..26):NSEL?

Response A numeric value: 1, 2, 3, or 4.

Example INST3:NSEL?

MEASure[:SCALar]:POWer:MAXimum?

Description This query returns the maximum power measurement value recorded for the currently selected channel in Continuous acquisition mode.

Syntax MEAS(0..26)[:SCAL]:POW:MAX?

Response A power measurement in the "±999.9999E±99" exponential format in the currently selected unit. The number of digits after the decimal point depends on the selected resolution. To change the resolution of the displayed power value in dB or dBm, use the FORM:READ[:DATA] command. To know the current measurement unit, use the SENS:POW:UNIT? query.

Example MEAS3:SCAL:POW:MAX?

See also MEAS:SCAL:POW:MIN?

MEASure[:SCALar]:POWer:MINimum?

Description This query returns the minimum power measurement value recorded for the currently selected channel in Continuous acquisition mode.

Syntax MEAS(0..26)[:SCAL]:POW:MIN?

Response A power measurement in the "±999.9999E±99" exponential format in the currently selected unit. The number of digits after the decimal point depends on the selected resolution. To change the resolution of the displayed power value in dB or dBm, use the FORM:READ[:DATA] command. To know the current measurement unit, use the SENS:POW:UNIT? query.

Example MEAS3:SCAL:POW:MIN?

See also MEAS:SCAL:POW:MAX?

MMEMory:ACQuisition

Description This command starts or stops a file acquisition using the set Continuous or Single acquisition rate. Acquisition data will be recorded to the system hard disk in the \IQ\USERFILE\IQ1600 directory. The acquisition will start until an acquisition stop (MMEM:ACQ 0) command is sent, otherwise will last for the duration set using the MMEM:ACQ:DURA command.

Syntax MMEM(0..26):ACQ<space><boolean>[,<value>]

Parameters The <boolean> parameter can be:
"0" -stop file acquisition
"1" -start file acquisition
The optional <value> parameter can be:
"CONT" or "0" -set Continuous acquisition rate
"NCON" or "1" -set Single acquisition rate.
The <value> parameter is considered only when starting an acquisition. If the <value> parameter is absent, the acquisition starts in Continuous mode by default.

Example MMEM3:ACQ 1,CONT

See also MMEM:ACQ?, MMEM:ACQ:DURA, and MMEM:ACQ:DURA?

MMEMory:ACQuisition?

Description This query returns a value indicating whether a file acquisition is in progress.

Syntax MMEM(0..26):ACQ?

Response The response is in the format:
"0" -no file acquisition in progress
"1" -file acquisition in progress

Example MMEM3:ACQ?

See also MMEM:ACQ, MMEM:ACQ:DURA, and MMEM:ACQ:DURA?

MMEMory:ACQuisition:DURAtion

Description This command defines the duration of the file acquisition.

Syntax MMEM(0..26):ACQ:DURA<space><numeric_value><numeric_value><numeric_value>

Parameters The 1st <numeric_value> parameter represents the hours, from 0 to 9999.
The 2nd <numeric_value> parameter represents the minutes, from 0 to 59.
The 3rd <numeric_value> parameter represents the seconds, from 0 to 59.

Example MMEM3:ACQ:DURA 0,30,15

See also MMEM:ACQ, MMEM:ACQ?, and MMEM:ACQ:DURA?

Note If the set duration is greater than that permitted in Single acquisition mode, the duration of the next Single acquisition will be the maximum permitted for the current Single acquisition rate. Example: when using a 4096 Hz Single rate, if the set duration is 0000:10:00, the actual duration will be 0000:00:04.

MMEMory:ACQuisition:DURAtion?

Description This query returns a value indicating the duration of the file acquisition (and not the time remaining for the acquisition).

Syntax MMEM(0..26):ACQ:DURA?

Response A value indicating the duration of the file acquisition in the "HHHH:MM:SS" format.

Example MMEM3:ACQ:DURA?

See also MMEM:ACQ, MMEM:ACQ?, and MMEM:ACQ:DURA

READ[:SCALar]:POWer:DC?

Description This query performs an initiate and fetch (for the selected channel when using a multi-channel high-speed power meter). A measurement value is stored and returned.

Syntax READ(0..26)[:SCAL]:POW:DC?

Response A power measurement in the "±999.9999E±99" exponential format in the currently selected unit. The number of digits after the decimal point depends on the selected resolution.

Example READ3:SCAL:POW:DC?

See also FETC[:SCAL]:POW:DC?, INIT:AUTO, INIT:CONT, INIT:CONT?, and INIT[:IMM]

CALibration:VALue

Description This command is used to set the calibration value of the instrument.

Syntax CAL(0..26):VAL<space><numeric>

Parameters The <numeric> parameter represents the new calibration value in the "9.999E±999" format. Depending on the current power unit, the numeric parameter is read in W or in dBm.

Note To determine the calibration value to enter, connect the source output to a power meter. The power read by the power meter is the parameter to enter with the CAL:VAL command.

To return the unit to its original factory calibration, use the value returned by CAL:RES? as a parameter in the CAL:VAL command.

The value used must not be more than 10 times greater or less than 10 times the factory calibration value. An attempt to exceed these limits will raise a "Parameter out of range" error message.

Example CAL4:VAL 0.002225

or

CAL4:VAL 2.225E-3

See also CAL:RES?

IQ-2400 WDM Laser Source Commands

The four different source operation modes available on the IQ-2400 WDM Laser Source are explained more in detail in *IQ-2400 WDM Laser Source Operation Modes* on page 143.

CALibration:RESetvalue?

Description This query returns the original calibration value used at the factory. To return the unit to its original factory calibration, use the value returned by CAL:RES? as a parameter to the CAL:VAL command.

Syntax CAL(0..26):RES?

Response A value representing the original calibration value used at the factory, in the "9999.999E±999" format. Depending on the current power unit, the original calibration value will be read in W or in dBm.

Example CAL4:RES?

See also CAL:VAL

SOURce:PROTection:SOFtExist?

Description This query returns a value indicating whether a software key-activated master control is present.

Syntax SOUR(0..26):PROT:SOFE?

Parameters The "safekey" string.

Response A boolean value:
"1" -software key is present
"0" -software key is not present

Example SOUR4:PROT:SOFE?

See also SOUR:PROT:RPWD, SOUR:PROT:SOFS?, and SOUR:PROT:SPWD

SOURce:PROTection:SOFtState?

Description This query returns the status of the software key-activated master control.

Syntax SOUR(0..26):PROT:SOFS?

Response A boolean value:
"1" -software key is activated
"0" -software key is not activated

Example SOUR4:PROT:SOFS?

See also SOUR:PROT:RPWD, SOUR:PROT:SOFE?, and SOUR:PROT:SPWD

SOURce:PROTection:RemovePassWorD

Description This command allows you to remove the software protection password.

Syntax SOUR(0..26):PROT:RPWD

Example SOUR4:PROT:RPWD

See also SOUR:PROT:SOFE? and SOUR:PROT:SOFS?

SOURce:PROTection:SetPassWorD

Description This command allows you to enter the software protection password.

Syntax SOUR(0..26):PROT:SPWD<string>

Parameters The "safekey" string.

Note Entering the password is necessary to activate the source.

Example SOUR4:PROT:SPWDsafekey

See also SOUR:PROT:SOFE? and SOUR:PROT:SOFS?

SOURce:POWer:STATe?

Description This query returns a value indicating the state of the optical source (on or off).

Syntax SOUR(0..26):POW:STAT?

Response A boolean value:
"1" -the source is on
"0" -the source is off

Example SOUR4:POW:STAT?

SOURce:PROTection:HARdExist?

Description This query returns a value indicating whether the integrated remote interlock connector is present.

Syntax SOUR(0..26):PROT:HARE?

Response A boolean value:
"1" -interlock connector is present
"0" -interlock connector is not present

Example SOUR4:PROT:HARE?

SOURce:PROTection:HARdState?

Description This query returns a value indicating the status of the integrated interlock connector.

Syntax SOUR(0..26):PROT:HARS?

Response A boolean value:
"1" -interlock connector is open
"0" -interlock connector is closed

Example SOUR4:PROT:HARS?

IQ-2300 ASE Laser Source Commands

SOURce:POWer:ATTenuation

Description This command changes the source internal attenuation. The source output power is at its maximum when the attenuation is set to 0.0 dB.

Syntax SOUR(0..26):POW:ATT<space><float>

Parameters A float parameter between 0.0 and 3.0 dB. The attenuation is a positive value.

Example SOUR4:POW:ATT 2.3

SOURce:POWer:ATTenuation?

Description This query returns the internal source power attenuation value.

Syntax SOUR(0..26):POW:ATT?

Response A float value between 0.0 and 3.0 (in dB).

Example SOUR4:POW:ATT?

SOURce:POWer:STATe

Description This command turns on or off the currently selected optical source. When the source is on, the red LED on the front of the module illuminates.

Syntax SOUR(0..26):POW:STAT<space><boolean>

Parameters A boolean parameter:
"1" -turn the source on
"0" -turn the source off

Example SOUR4:POW:STAT 1

SOURce:POWer:WAVelength:COUNt?

Description This query returns the number of available sources on the module.

Syntax SOUR(0..26):POW:WAV:COUN?

Response A value representing the number of sources:
"1" -one wavelength available
"2" -two wavelengths available

Example SOUR4:POW:WAV:COUN?

SOURce:POWer:WAVelength:DUAL?

Description This query returns a value indicating whether two sources are simultaneously selected on the module.

Syntax SOUR(0..26):POW:WAV:DUAL?

Response A boolean value:
"0" -one wavelength selected
"1" -two wavelengths selected (only possible with an IQ-2123BH hybrid source)

Note If the source is not a hybrid source (IQ-2123BH), this query will always return "0".

Example SOUR4:POW:WAV:DUAL?

SOURce:POWer:STATe?

Description This query returns a value indicating the state of the optical source (on or off).

Syntax SOUR(0..26):POW:STAT?

Response "0" -the source is off
"1" -the source is on

Example SOUR4:POW:STAT?

SOURce:POWer:WAVelength

Description This command selects a wavelength when using a dual-wavelength source module (IQ-2112 or IQ-2123).

Syntax SOUR(0..26):POW:WAV<space><value>

Parameters The <value> parameter can be:
"UPP" -switch to the highest wavelength
"LOW" -switch to the lowest wavelength
"DUAL" -activate both sources on a hybrid source (IQ-2123BH)

Example SOUR4:POW:WAV UPP

SOURce:POWer:WAVelength?

Description This query returns a value indicating which wavelength is currently selected.

Syntax SOUR(0..26):POW:WAV?

Response A four-digit number identifying the current wavelength (in nm) in the "9999" format.

Example SOUR4:POW:WAV?

SOURce:POWer:ATTenuation

Description This command changes the source internal attenuation. The source power is at its maximum when the attenuation is set to 0.0 dB.

Syntax SOUR(0..26):POW:ATT<space><value>[<space><units>]

Parameters The <value> parameter is between 0.0 and 10.0 for laser sources and between 0.0 and 6.0 for LED sources. The attenuation is a positive value in dB.
The <units> parameter is DB and is optional.

Note On the IQ-2123BH, no attenuation can be set when both sources are active.

Example SOUR4:POW:ATT 5.2 DB

SOURce:POWer:ATTenuation?

Description This query returns the internal source power attenuation value.

Syntax SOUR(0..26):POW:ATT?

Response A value between 0.0 and 10.0 (in dB) in the "99.9" format.

Example SOUR4:POW:ATT?

SOURce:POWer:STATe

Description This command turns on or off the optical source. When the source is on, the red LED (Active) on the front of the module illuminates.

Syntax SOUR(0..26):POW:STAT<space><state>

Parameters The <state> parameter is a boolean value:
"0" or "OFF" -turn off the source
"1" or "ON" -turn on the source

Example SOUR4:POW:STAT ON

IQ-2100 Light Source Commands

SOURce:AM[:INTernal]:FREQuency

Description This command selects the internal modulation frequency. The internal modulation is 50 % duty cycle at the selected frequency.

Syntax SOUR(0..26):AM[:INT]:FREQ<space><value>
[<space><units>]

Parameters The <value> parameter represents the new modulation frequency: 270 Hz, 1000 Hz, 2000 Hz, or CW (or 0) for no modulation).
The <units> parameter is optional and can be HZ or KHZ.

Note No modulation can be set on the IQ-2123BH.

Example SOUR4AM:INT:FREQ 270 HZ -set modulation to 270 Hz
or
SOUR4:AM:INT:FREQ CW -set modulation to none

SOURce:AM[:INTernal]:FREQuency?

Description This query returns a value indicating the current internal modulation frequency. If the source is in CW mode, the function will return "0".

Syntax SOUR(0..26):AM[:INT]:FREQ?

Response A four-digit integer identifying the frequency (in Hz) in the "9999" format. If the source is in CW mode, the return value is "0".

Example SOUR4:AM:FREQ?

TRIGger:SEQuence:STATe?

Description This query returns the status of the trigger condition.

Syntax TRIG(0..26):SEQ:STAT?

Response
"0" -trigger inactive
"1" -trigger active

Example TRIG3:SEQ:STAT?

See also TRIG:SEQ:LEV, TRIG:SEQ:LEV?, TRIG:SEQ:SLOP, TRIG:SEQ:SLOP?, TRIG:SEQ:SOUR, TRIG:SEQ:SOUR?, and TRIG:SEQ:STAT

UNIT:POWer

Description This command changes the measurement unit (for the selected channel when using a multi-channel high-speed power meter).

Syntax UNIT(0..26):POW<space><value>

Parameters The <value> parameter can be:
"DB" or "0" -set measurement unit to dB
"DBM" or "1" -set measurement unit to dBm
"W" or "2" -set measurement unit to W (pW, nW, μW, mW...)
"W/W" or "3" -set measurement unit to W/W (pW/W, ...)

Example UNIT3:POW DBM

See also SENS:POW:UNIT and SENS:POW:UNIT?

TRIGger:SEQuence:SOURce?

Description This query returns the source of the trigger condition.

Syntax TRIG(0..26):SEQ:SOUR?

Response
"EXTERNAL" -external trigger
"INTERNAL1" -channel 1
"INTERNAL2" -channel 2 (IQ-1620 or IQ-1640)
"INTERNAL3" -channel 3 (IQ-1640)
"INTERNAL4" -channel 4 (IQ-1640)

Example TRIG3:SEQ:SOUR?

See also TRIG:SEQ:LEV, TRIG:SEQ:LEV?, TRIG:SEQ:SLOP, TRIG:SEQ:SLOP?, TRIG:SEQ:SOUR, TRIG:SEQ:STAT, and TRIG:SEQ:STAT?

TRIGger:SEQuence:STATe

Description This command sets the state of the trigger condition.

Syntax TRIG(0..26):SEQ:STAT<space><boolean>

Parameters The <boolean> parameter represents the status of the trigger condition:
"0" -deactivate trigger condition
"1" -activate trigger condition

Example TRIG3:SEQ:STAT 0

See also TRIG:SEQ:LEV, TRIG:SEQ:LEV?, TRIG:SEQ:SLOP, TRIG:SEQ:SLOP?, TRIG:SEQ:SOUR, TRIG:SEQ:SOUR?, and TRIG:SEQ:STAT?

TRIGger:SEQuence:SLOPe?

Description This query returns the rising or falling edge status of the trigger condition, i.e., whether positive or negative transitions will trigger the acquisition.

Syntax TRIG(0..26):SEQ:SLOP?

Response
POSITIVE -rising edge trigger
NEGATIVE -falling edge trigger

Example TRIG3:SEQ:SLOP?

See also TRIG:SEQ:LEV, TRIG:SEQ:LEV?, TRIG:SEQ:SLOP, TRIG:SEQ:SOUR, TRIG:SEQ:SOUR?, TRIG:SEQ:STAT, and TRIG:SEQ:STAT?

TRIGger:SEQuence:SOURce

Description This command sets the source of the trigger condition.

Syntax TRIG(0..26):SEQ:SOUR<space><value>

Parameters The <value> parameter can be:
"EXT" or "0" -external trigger
"INT1" or "1" -channel 1
"INT2" or "2" -channel 2 (IQ-1620 or IQ-1640)
"INT3" or "3" -channel 3 (IQ-1640)
"INT4" or "4"-channel 4 (IQ-1640)

Example TRIG3:SEQ:SOUR EXT

See also TRIG:SEQ:LEV, TRIG:SEQ:LEV?, TRIG:SEQ:SLOP, TRIG:SEQ:SLOP?, TRIG:SEQ:SOUR, TRIG:SEQ:SOUR?, TRIG:SEQ:STAT, and TRIG:SEQ:STAT?

TRIGger:SEQuence:LEVel?

Description This query returns the power level of the trigger condition to be met to start an acquisition, in dBm or W depending on the currently selected unit.

Syntax TRIG(0..26):SEQ:LEV?

Response The trigger power level in the "-90.000" to "+90.000" (dBm) or in the "+001.0000" (pW) to "+999.9999" (kW) format depending on the currently selected unit.

Example TRIG3:SEQ:LEV?

See also TRIG:SEQ:LEV, TRIG:SEQ:SLOP, TRIG:SEQ:SLOP?, TRIG:SEQ:SOUR, TRIG:SEQ:SOUR?, TRIG:SEQ:STAT, and TRIG:SEQ:STAT?

TRIGger:SEQuence:SLOPe

Description This command sets the edge status of the trigger condition, i.e., defines whether acquisitions will be triggered by positive or negative transitions.

Syntax TRIG(0..26):SEQ:SLOP<space><value>

Parameters The <value> parameter defines the trigger condition status:
"NEG" or "0" -falling edge trigger
"POS" or "1" -rising edge trigger

Example TRIG3:SEQ:SLOP POS

See also TRIG:SEQ:LEV, TRIG:SEQ:LEV?, TRIG:SEQ:SLOP, TRIG:SEQ:SLOP?, TRIG:SEQ:SOUR, TRIG:SEQ:SOUR?, TRIG:SEQ:STAT, and TRIG:SEQ:STAT?

TRIGger:POSition:CATalog?

Description This query returns a list of values indicating the available values of the trigger position, i.e., the percentage of points that will be acquired in Single acquisition mode before the trigger is met.

Syntax TRIG(0..26):POS:CAT?

Response A range of values in the "99;99;99..." format representing the available trigger positions.

Example TRIG3:POS:CAT?

See also TRIG:POS

TRIGger:SEQuence:LEVel

Description This command sets the power level of the trigger condition to be met to start an acquisition in dBm or W, depending on the currently selected unit. The trigger level must be set in absolute power measurement mode and must be within the range of the active channel.

Syntax TRIG(0..26):SEQ:LEV<numeric_value><unit>

Parameters The <numeric_value> is the trigger power level in the "-90.000" to "+90.000" (dBm) or in the "+001.0000" (pW) to "+999.9999" (kW) format.

The <unit> parameter represents the unit:

"DBM" -dBm

"W" -W units (pW, nW, μW, mW...)

Example TRIG3:SEQ:LEV 16.804 DBM

See also TRIG:SEQ:LEV?, TRIG:SEQ:SLOP, TRIG:SEQ:SLOP?, TRIG:SEQ:SOUR, TRIG:SEQ:SOUR?, TRIG:SEQ:STAT, and TRIG:SEQ:STAT?

TRIGger:POSition

Description This command sets the position of the trigger. The percentage (in 5 % steps from 5 % to 50 %) applies to file acquisitions in Single mode (MMEM:ACQ 1,NCON) and to programmed acquisitions (INIT:AUTO 1,NCON). For a file acquisition, it is the percentage of the total duration (e.g., 50 % of 10 seconds means 5 sec. before the trigger and 5 sec. after the trigger). For a programmed acquisition, it is the percentage of points (e.g., 25 % of 1000 points means 250 points before the trigger and 750 points after the trigger).

Syntax TRIG(0..26):POS<space><value>

Parameters The <value> parameter can be:

"TRIG_POS0" or "0"	-0 %
"TRIG_POS5" or "5"	-5 %
"TRIG_POS10" or "10"	-10 %
...	
"TRIG_POS45" or "45"	-45 %
"TRIG_POS50" or "50"	-50 %

Example TRIG3:POS 20 or TRIG3:POS TRIG_POS20

See also TRIG:CAT?

TRIGger:POSition?

Description This query returns a value indicating the position of the trigger, i.e., the percentage of points that will be acquired in Single acquisition mode before the trigger is met.

Syntax TRIG(0..26):POS?

Response A value in the "99" format representing the percentage of points before the trigger.

Example TRIG3:POS?

TRACe:POINts?

Description This query returns the number of points acquired so far (for the currently selected channel when using a multi-channel high-speed power meter).

Syntax TRAC(0..26):POIN?

Response The number of points in the "99999" format.

Example TRAC3:POIN?

See also TRAC:DATA?

Note This query can be used before, during, and after the programmed acquisition (started using the INIT:AUTO command). Tip: this query is especially useful for determining the end of a programmed acquisition.

TRACe:MINimum?

Description This query returns the minimum power measurement value previously acquired with the INIT:AUTO 1,NCON or MMEM:ACQ: 1,NCON command (in Single acquisition mode) and for the currently selected channel when using a multi-channel high-speed power meter.

Syntax TRAC(0..26):MIN?

Response A power measurement in the "±999.9999E±99" exponential format in the currently selected unit. The number of digits after the decimal point depends on the selected resolution. To change the resolution of the displayed power value in dB or dBm, use the FORM:READ[:DATA] command. To know the current measurement unit, use the SENS:POW:UNIT? query.

Example TRAC3:MIN?

See also TRAC:MAX?

TRACe:POINts

Description This command sets the number of points that will be used in the next programmed acquisition via the INIT:AUTO command. The maximum possible value is 16 383.

Syntax TRAC(0..26):POIN<space><numeric_value>[,ALL]

Parameters The <numeric_value> parameter is the number of points to be acquired using a programmed acquisition in the "99999" format.

The optional [ALL] parameter indicates if the number of points applies to the currently selected channel or to all channels (when using a multi-channel high-speed power meter).

Example TRAC3:POIN 1200 (1200 points for active channel)
TRAC3:POIN 1200,ALL (1200 points for all channels)

See also INIT:AUTO, TRAC:DATA? and TRAC:POIN?

TRACe:DATA?

Description This query returns the power measurements previously acquired with the INIT:AUTO command (for the currently selected channel when using a multi-channel high-speed power meter).

Syntax TRAC(0..26):DATA?<space><segment_nb>

Response Power measurements in the "±999.9999E±99; ±999.9999E±99;..." format.
The <segment_nb> parameter is the segment number. Each segment contains a maximum of 4096 values. The first segment bears number 0.

Example TRAC3:DATA? 4

See also TRAC:POIN

TRACe:MAXimum?

Description This query returns the maximum power measurement value previously acquired with the INIT:AUTO 1,NCON or MMEM:ACQ: 1,NCON command (in Single acquisition mode) and for the currently selected channel when using a multi-channel high-speed power meter.

Syntax TRAC(0..26):MAX?

Response A power measurement in the "±999.9999E±99" exponential format in the currently selected unit. The number of digits after the decimal point depends on the selected resolution. To change the resolution of the displayed power value in dB or dBm, use the FORM:READ[:DATA] command. To know the current measurement unit, use the SENS:POW:UNIT? query.

Example TRAC3:MAX?

See also TRACE:MIN?

SENSitivity:POWer:WAVelength

Description This command selects a new operating wavelength (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:WAV<space><numeric_value>
[<space>NM]

Parameters The <numeric_value> parameter is an operating wavelength using nm. Any wavelength within the spectral range of the power meter optical detector at 0.01 nm resolution may be selected. See the power meter instruction manual for the exact spectral range of each detector type. An invalid parameter will raise an "Illegal parameter value" error message.

Example SENS3:POW:WAV 1310.12

SENSitivity:POWer:WAVelength?

Description This query returns the currently selected wavelength (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:WAV?

Response The current wavelength in nanometers (nm) in the "9999.99 nm" format.

Example SENS3:POW:WAV?
1310.12 nm

SENSitivity:POWer:UNIT

Description This command changes the absolute measurement display unit: dBm or W (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:UNIT<space><value>

Parameters The <value> parameter can be:
"DBM" or "0" -set power display to dBm
"W" or "1" -set power display to W (pW, nW, μW, mW...)

Example SENS3:POW:UNIT DBM

See also SENS:POW:UNIT? and UNIT:POW

SENSitivity:POWer:UNIT?

Description This query returns the current absolute power measurement display unit (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:UNIT?

Response "0" -current unit is dBm
"1" -current unit is W (pW, nW, μW, mW...)

Example SENS3:POW:UNIT?

See also SENS:POW:UNIT and UNIT:POW

SENSitivity:POWer:REFerence:STATe

Description This command selects whether absolute (dBm or W) or relative (dB or W/W) power measurements are performed (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:REF:STAT<space><boolean>

Parameters The <boolean> value represents either dB and W, or dBm and W/W:
"0" -select absolute (dBm or W)
"1" -select relative (dB or W/W)

Example SENS3:POW:REF:STAT 0

SENSitivity:POWer:REFerence:STATe?

Description This query returns a value indicating whether the high-speed power meter is displaying absolute (dBm or W) or relative (dB or W/W) power values (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:REF:STAT?

Response "0" -absolute mode (dBm or W)
"1" -relative mode (dB or W/W)

Example SENS3:POW:REF:STAT?

SENSitivity:POWer:REFerence?

Description This query returns the reference power for the current wavelength (for the currently selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:REF?

Response Current reference value in dBm or W (depending on the current unit), which can be any value within the power range of the power meter in the "±999.9999" (dBm) or "+9.9999E-999" (W) format.

Example SENS3:POW:REF?
49.428 dBm

SENSitivity:POWer:REFerence:DISPlay

Description This command performs a new reference measurement for the current wavelength and changes the display to read relative power (dB or W/W), for the selected channel when using a multi-channel high-speed power meter.

Syntax SENS(0..26):POW:REF:DISP

Example SENS3:POW:REF:DISP

SENSitivity:POWer:RANGe:LOW

Description This command sets the power measurement range to manual low (for the currently selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:RANG:LOW<space><numeric_value>

Parameters The <numeric_value> parameter can be 1, 2, 3, 4, 5, or 6 corresponding to manual LR1 to LR6.

Example SENS3:POW:RANG:LOW 4

See also SENS:POW:RANG?, SENS:POW:RANG:AUTO, SENS:POW:RANG:AUTO?, SENS:POW:RANG:HIGH, and SENS:POW:RANG:LIST?

SENSitivity:POWer:REFerence

Description This command sets a user-defined reference value (in dBm or W), for the selected channel when using a multi-channel high-speed power meter.

Syntax SENS(0..26):POW:REF<space><numeric_value><unit>

Parameters The <numeric_value> parameter is the user-defined reference value, in the "999.9999" (dBm) or "+9.9999E-999" (W) format.

The <unit> parameter represents the unit:

"DBM" -set dBm
"W" -set W
"MW" -set mW
"UW" -set μW
"NW" -set nW
"PW" -set pW

Example SENS3:POW:REF 10NW

SENSitivity:POWer:RANGe:HIGH

Description This command sets the power measurement range to manual high (for the currently selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):POW:RANG:HIGH<space><numeric_value>

Parameters The <numeric_value> parameter can be 1, 2, 3, or 4 corresponding to manual HR1 to HR4.

Example SENS3:POW:RANG:HIGH 2

See also SENS:POW:RANG?, SENS:POW:RANG:AUTO, SENS:POW:RANG:AUTO?, SENS:POW:RANG:LIST?, and SENS:POW:RANG:LOW

SENSitivity:POWer:RANGe:LIST?

Description This query returns the list of all available measurement ranges, expressed in dBm or W depending on the current unit.

Syntax SENS:POW:RANG:LIST?

Response The list of available measuring ranges (in dBm or W) in the "±99.99 to ±99.99" (dBm) or "±999.9999E±99 to ±999.9999E±99" (W) format:

"AUTO" -automatic range (Autorange)
"HR1..4" -high range
"LR1..6" -low range

Example SENS3:POW:RANG:LIST?

See also SENS:POW:RANG?, SENS:POW:RANG:AUTO, SENS:POW:RANG:AUTO?, SENS:POW:RANG:HIGH, and SENS:POW:RANG:LOW

SENSitivity:POWer:RANGe:AUTOmatic

Description This command sets the power measurement range to automatic (Autorange), for the currently selected channel when using a multi-channel high-speed power meter.

Syntax SENS(0..26):POW:RANG:AUTO<space><boolean>

Parameters The <boolean> parameter can be:
"0" -disable Autorange
"1" -enable Autorange

Example SENS3:POW:RANG:AUTO 1

See also SENS:POW:RANG?, SENS:POW:RANG:AUTO?, SENS:POW:RANG:HIGH, SENS:POW:RANG:LIST?, and SENS:POW:RANG:LOW

Note The Autorange function can be performed in Continuous acquisition mode only. When Autorange is deactivated, LR1 is activated by default.

SENSitivity:POWer:RANGe:AUTOmatic?

Description This query returns a value indicating whether automatic power measurement range (Autorange) is enabled or disabled, for the currently selected channel when using a multi-channel high-speed power meter.

Syntax SENS(0..26):POW:RANG:AUTO?

Response "0" -Autorange is disabled
"1" -Autorange is enabled

Example SENS:POW:RANG:AUTO?

See also SENS:POW:RANG?, SENS:POW:RANG:AUTO, SENS:POW:RANG:HIGH, SENS:POW:RANG:LIST?, and SENS:POW:RANG:LOW

SENSitivity:POWer:RANGe?

Description This query returns the currently selected power measurement range (for the selected channel when using a multi-channel high-speed power meter), expressed in dBm or W depending on the current unit.

Syntax SENS(0..26):POW:RANG?

Response The currently selected range (in dBm or W) in the "±99.99 to ±99.99" (dBm) or "+999.99E±999 to +999.99E±999" (W) format:

"AUTO" -automatic range (Autorange)
"HR1..4" -high range
"LR1..6" -low range

Example SENS3:POW:RANG?

See also SENS:POW:RANG:AUTO, SENS:POW:RANG:AUTO?, SENS:POW:RANG:HIGH, SENS:POW:RANG:LIST?, and SENS:POW:RANG:LOW

SENSitivity:FREQuency:NCONtinuous?

Description This query returns the single acquisition rate.

Syntax SENS(0..26):FREQ:NCON?

Response The current single acquisition rate in the "9999.9" format.

Example SENS3:FREQ:NCON?

See also SENS:FREQ[:CONT], SENS:FREQ:CONT?, SENS:FREQ[:CONT]:CAT?, SENS:FREQ:NCON, and SENS:FREQ:NCON:CAT?

SENSitivity:FREQuency:NCONtinuous:CATalog?

Description This query returns the list of available single acquisition rates.

Syntax SENS(0..26):FREQ:NCON:CAT?

Response The list of available single acquisition rates in the "9999.9;9999.9;..." format.

Example SENS3:FREQ:NCON:CAT?

See also SENS:FREQ[:CONT], SENS:FREQ:CONT?, SENS:FREQ[:CONT]:CAT?, SENS:FREQ:NCON, and SENS:FREQ:NCON?

SENSitivity:FREQuency[:CONTinuous]:CATalog?

Description This query returns the list of available continuous acquisition rates.

Syntax SENS(0..26):FREQ[:CONT]:CAT?

Response The list of available continuous acquisition rates in the "999.999;999.999;..." format.

Example SENS3:FREQ:CONT:CAT?

See also SENS:FREQ[:CONT], SENS:FREQ:CONT?, SENS:FREQ:NCON, SENS:FREQ:NCON?, and SENS:FREQ:NCON:CAT?

SENSitivity:FREQuency:NCONtinuous

Description This command sets the single acquisition rate.

Syntax SENS(0..26):FREQ:NCON<space><numeric_value>[<space>HZ]

Parameters The <numeric_value> parameter is the single acquisition rate in the "9999" format: 512 Hz, 1024 Hz, 2048 Hz, and 4096 Hz. If an invalid parameter is entered, the "Illegal parameter value" error message appears.

Example SENS3:FREQ:NCON 512

See also SENS:FREQ[:CONT], SENS:FREQ:CONT?, SENS:FREQ[:CONT]:CAT?, SENS:FREQ:NCON?, and SENS:FREQ:NCON:CAT?

SENSitivity:FREQuency[:CONTinuous]

Description This command sets the continuous acquisition rate.

Syntax SENS(0..26):FREQ[:CONT]<space><numeric_value>
[<space>HZ]

Parameters The <numeric_value> parameter is the continuous acquisition rate: 0.250 Hz, 0.500 Hz, 1 Hz, 2 Hz, 4 Hz, 8 Hz, 16 Hz, 32 Hz, 64 Hz, 128 Hz, and 256 Hz.
If an invalid parameter is entered, the "Invalid sampling rate" error message appears.

Example SENS3:FREQ:CONT 1

See also SENS:FREQ:CONT?, SENS:FREQ[:CONT]:CAT?, SENS:FREQ:NCON, SENS:FREQ:NCON?, and SENS:FREQ:NCON:CAT?

SENSitivity:FREQuency:CONTinuous?

Description This query returns the current continuous acquisition rate.

Syntax SENS(0..26):FREQ:CONT?

Response The current continuous acquisition rate in the "999.999" format.

Example SENS3:FREQ:CONT?

See also SENS:FREQ[:CONT], SENS:FREQ[:CONT]:CAT?, SENS:FREQ:NCON, SENS:FREQ:NCON?, and SENS:FREQ:NCON:CAT?

SENSitivity:CORRection:OFFSet[:MAGNitude]

Description This command sets a correction factor (for the selected channel when using a multi-channel high-speed power meter). The correction factor will be a positive or negative value when dB or dBm units are selected, or a positive value when W or W/W units are selected.

Syntax SENS(0..26):CORR:OFFS[:MAGN]<space><numeric_value><space><unit>

Parameters The <numeric_value> parameter is a correction factor with dB or W/W units.

-10.0 ≤ numeric_value ≤ 6.989 (dB)

0.1 ≤ numeric_value ≤ 5.0 (W/W)

The <unit> parameter can be DB or W/W

If an invalid <numeric_value> parameter is entered, the "Parameter out of range" message appears.

If an invalid <unit> parameter is entered, the "Data type error" message appears.

Example SENS3:CORR:OFFS:MAGN 22.105 DB

Note The correction factor when expressed in W/W indicates the ratio between the power received (in W) and the reference (in W) for the current wavelength and channel.

SENSitivity:CORRection:COLLect:ZERO

Description This command performs an offset nulling measurement (on the currently selected channel when using a multi-channel high-speed power meter). If light is detected, the "Light detected" error message is raised.

Syntax SENS(0..26):CORR:COLL:ZERO[<space>ALL]

Parameters The optional <ALL> parameter will perform the null measurement on all channels when using a multi-channel high-speed power meter.

Example SENS3:CORR:COLL:ZERO

Note The "Null All" function is specific to the multi-channel power meter.

SENSitivity:AVERage[:STATe]

Description This command activates or deactivates data averaging (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):AVER[:STAT]<space><boolean>

Parameters The <boolean> parameter can be:
"0" -disable averaging
"1" -enable averaging

Example SENS3:AVER:STAT 1

SENSitivity:AVERage:STATe?

Description This query returns a value indicating whether data averaging is enabled or disabled (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):AVER:STAT?

Response "0" -averaging is disabled
"1" -averaging is enabled

Example SENS3:AVER:STAT?

SENSitivity:AVERage:COUNt

Description This command sets the number of power measurements that will be used to compute data averaging (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS:AVER:COUN<space><digit>

Parameters The <digit> parameter is the number of power measurements to be used to compute data averaging in the "999" format.

Example SENS:AVER:COUN 12

See also SENS:AVER:COUN?, SENS:AVER:STAT, and SENS:AVER:STAT?

SENSitivity:AVERage:COUNt?

Description This query returns the number of power measurements used to compute data averaging (for the selected channel when using a multi-channel high-speed power meter).

Syntax SENS(0..26):AVER:COUN?

Response The number of power measurements used to compute data averaging in the "999" format.

Example SENS3:AVER:COUN?

See also SENS:AVER:COUN, SENS:AVER:STAT, and SENS:AVER:STAT?

INPut:CHANnel?

Description This query returns the channel number of the module. The available wavelength band is divided into channels. Each channel is characterized by a number. The output of each module corresponds to one channel and cannot be modified.

Syntax INP(0..26):CHAN?

Response An unsigned integer representing the channel number in the "99" format, between 00 and 99.

Example INP4:CHAN?

See also SOUR:CURR:CHAN?, SOUR:TEMP:CHAN?, SOUR:WAV:CHAN?, SOUR:POW:CHAN?, and SOUR:CURR:CHBA?

OUTPut:SOURce:ACCOutput

Description This command sets the delta temperature (in °C) and the delta current of the laser (in amperes).

Syntax OUTP(0..26):SOUR:ACCO<space><deltaT>,<deltaC>

Parameters The <deltaT> parameter represents the delta temperature of the laser (in °C) in the "9999.99" format. The value used must be equal to or between the values returned by SOUR:TEMP:LIM:LOW? and SOUR:TEMP:LIM:HIGH?.

The <deltaC> parameter represents the delta current of the laser (in amperes) in the "±99.99" format. The value used must be equal to or between the values returned by SOUR:CURR:LIM:LOW? and SOUR:CURR:LIM:HIGH?.

The SOUR:CURR:LIM:STEP? and SOUR:TEMP:LIM:STEP? queries return the module sensitivity.

A request to change the value by a quantity less than the step will be ignored.

Note This command must only be called when the module is either in High Wavelength Stability or On/Off modulation mode. If the module is not in these modes, the parameters will be read as a requested wavelength and a requested power, and the "Invalid mode" error message will be raised.

Example OUTP4:SOUR:ACCO 0.1,0.0001

See also SOUR:CURR:LIM:HIGH?, SOUR:CURR:LIM:LOW?, SOUR:CURR:LIM:STEP?, SOUR:TEMP:LIM:HIGH?, SOUR:TEMP:LIM:LOW?, and SOUR:TEMP:LIM:STEP?

OUTPut:SOURce:APCOutput

Description This command is used to set the wavelength (if the current spectral unit is nm) or the frequency (if the current spectral unit is THz) and the power of the signal.

Syntax OUTP(0..26):SOUR:APCO<space><wave>,<power>

Parameters The <wave> parameter represents a new wavelength (if the current spectral unit is nm), or a new frequency (if the current spectral unit is THz) in the "±9.999E+9" format. The value used must be equal to or between the values returned by the SOUR:WAV:LIM:LOW? and SOUR:WAV:LIM:HIGH? queries.

The <power> parameter represents a new power of the signal in W or dBm (depending on the current power unit) in the "±9.999E+9" format. The value used must be equal to or between the values returned by SOUR:POW:LIM:LOW and SOUR:POW:LIM:HIGH.

The SOUR:WAV:LIM:STEP? and SOUR:POW:LIM:STEP? queries return the module sensitivity.

A request to change the value by a quantity less than the step will be ignored.

Note This command must only be called when the module is either in Normal or Normal/Dither mode. If the module is not in these modes, the parameters will be read as a requested delta temperature and a requested delta current, and the "Invalid mode" error message will be raised.

Example OUTP4:SOUR:APCO 1550,2.54

See also SOUR:POW:LIM:HIGH?, SOUR:POW:LIM:LOW?, SOUR:POW:LIM:STEP?, SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:LOW?, SOUR:WAV:LIM:STEP?, UNIT:POW, and UNIT:WAV

OUTPut:SOURce:MODE

Description This command sets the operation mode of the source.

Syntax OUTP(0..26):SOUR:MODE<space><parameter>

Parameters A parameter indicating the new source mode:

"0" or "APC"	-set Normal mode
"1" or "ACC"	-set High Wavelength Stability mode
"2" or "APCDITHER"	-set Normal mode with Dither modulation
"3" or "ACCONOFF"	-set On/Off modulation mode

Note After the mode is changed, the module needs some time to stabilize. It is very important not to change the mode while the module is stabilizing. This would cause the module to return to its central wavelength in Normal mode. Before changing the mode, you should poll OUTP:STAB? until it returns "1", indicating that the module has stabilized.

Example OUTP4:SOUR:MODE APC

OUTPut:SOURce:MODE?

Description This query returns the current operation mode of the source.

Syntax OUTP(0..26):SOUR:MODE?

Response A value representing the current mode of the source:

"0" -the source is set to Normal mode
"1" -the source is set to High Wavelength Stability mode
"2" -the source is set to Normal mode with Dither modulation
"3" -the source is set to On/Off modulation mode

Example OUTP4:SOUR:MODE?

OUTPut:SOURce:SETPoint

Description This command sets the module to a predefined setpoint. No command is provided to create setpoints. Setpoints have to be created from within the IQ application software.

Syntax OUTP(0..26):SOUR:SETP<space><setpoint>,<mode>

Parameters The <setpoint> parameter is a string parameter representing the name of the setpoint. This name is not case-sensitive.

The <mode> parameter represents the mode of the setpoint:

"0" or "APC" -Normal mode

"1" or "ACC" -High Wavelength Stability (HWS) mode

Note Note that no modulation is associated with a setpoint. Therefore, a setpoint created in Normal or Normal with Dither modulation mode will be considered as having Normal (APC) mode. A setpoint created in either HWS or On/Off modulation mode will have HWS (ACC) mode. In turn, a setpoint having Normal mode can be used in Normal or Normal with Dither mode. Also, a setpoint having HWS mode can be used as well in On/Off modulation mode. The mode must be supplied because setpoints in Normal and HWS mode may have the same name. Therefore, the application will search for the specified setpoint with the specified mode. If such a setpoint exists, the application will adjust the wavelength, power, current step, and temperature step according to the setpoint. If the setpoint does not exist, there will be no change.

Modes: If the instrument is in Normal or Normal with Dither modes and the setpoint is in Normal mode, there will be no change to the mode of the instrument. If the setpoint has HWS mode, the application will go to HWS mode. If the instrument is in HWS or On/Off mode and the setpoint is in HWS mode, there will be no change in mode. If the setpoint has Normal mode, the instrument will go to Normal mode.

Example OUTP4:SOUR:SETP config05,1

See also SOUR:CURR:ACCB and SOUR:CURR:ACCB?

OUTPut:SOURce:STATe

Description This command turns on or off the currently selected optical source. When the source is on, the red LED on the front of the module illuminates.

Syntax OUTP(0..26):SOUR:STAT<space><boolean>

Parameters The <boolean> value can be:
"1" or "ON" -turn the source on
"0" or "OFF" -turn the source off

Note An invalid parameter will turn the module off.

Example OUTP4:SOUR:STAT ON

OUTPut:SOURce:STATe?

Description This query returns a value indicating the state of the optical source (on or off).

Syntax OUTP(0..26):SOUR:STAT?

Response "1" -the source is on
"0" -the source is off

Example OUTP4:SOUR:STAT?

OUTPut:STABle?

Description This query indicates whether the source is stable or stabilizing.

Syntax OUTP(0..26):STAB?

Response A boolean value:
"1" -the module has stabilized
"0" -the module is stabilizing

Note After the mode is changed, the module needs some time to stabilize. It is very important not to change the mode while the module is stabilizing. This would cause the module to return to its central wavelength in Normal mode. Before changing the mode, you should poll OUTP:STAB? until it returns "1", indicating that the module has stabilized.

Example OUTP4:STAB?

See also OUTP:STAT?

OUTPut:STATe?

Description This query returns that state of the source module following its last command execution.

Syntax OUTP(0..26):STAT?

Response A value indicating the state of the source module:

"00"	-the state is Normal;
"01"	-the module is stabilizing;
"11"	-the requested wavelength or temperature cannot be maintained. The module has become unstable. This applies to all modes (APC, ACC, or Modulation);
"12"	-in Normal or Dither mode, this means that the wavelength has stabilized. In HWS or On/Off modulation mode, this means that the temperature has stabilized;
"13"	-the requested power or current cannot be maintained. The module has become unstable. This applies to all modes (APC, ACC, or Modulation);
"14"	-in Normal or Dither mode, this means that the power has stabilized. In HWS or On/Off modulation mode, this means that the current has stabilized;
"21"	-the requested power is too low (APC mode);
"22"	-the requested power is too high (APC mode);
"23"	-the requested current is too low (ACC mode);
"24"	-the requested current is too high (ACC mode);
"25"	-the requested wavelength is too low (APC mode) or the requested temperature is too high (ACC mode);
"26"	-the requested wavelength is too high (APC mode) or the requested temperature is too low (ACC mode);
"27"	-the requested modulation amplitude is too low;
"28"	-the requested modulation amplitude is too high;
"29"	-using the present module calibration, the calculations do not converge;
"91"	-fatal error: the laser temperature is out of range;

Response *(continued)*

"92"	-fatal error: the TEC is not operating properly;
"94"	-fatal error: the ambient temperature is out of range;
"95"	-fatal error: the ADC is not operating properly;
"98"	-fatal error: the laser current is out of range;
"99"	-fatal error: the laser power is out of range.

Note This query should be used only to gain information on certain potential error conditions. To find out whether the source module is stable, you should use the STAB? query.

Example OUTP4:STAT?

See also OUTP:STAB?

SOURce:CURRent:ACCBase

Description This command is used to set the ACC base current (in amperes). The base current is the actual current of the laser. For this command to function properly, the instrument must be in High Wavelength Stability or On/Off modulation mode and the OUTP:STAB? query must return "1" (stable). Normally, this command would rarely be used.

Syntax SOUR(0..26):CURR:ACCB

Parameters The desired current of the module, in the "+9.999E+9" format.

Note The current properties of the laser may change with time. For this reason, if a setpoint was defined in High Wavelength Stability or On/Off modulation mode, and you want to return to it at a later date, the wavelength and power may differ from those defined with the current step and temperature step when the setpoint was created. To cancel this effect, when creating a setpoint in the above named modes, the base current is recorded internally. This base current is sent to the instrument when returning to the mentioned setpoint. All this is done automatically and is transparent to the user.

Example SOUR4:CURR:ACCB

See also OUTP:SOUR:SETP

SOURce:CURRent:ACCBase?

Description This query returns the ACC base current (in amperes). For this query to function properly, the instrument must be in High Wavelength Stability or On/Off modulation mode and the OUTP:STAB? query return "1" (stable).

Syntax SOUR(0..26):CURR:ACCB?

Response A value representing the ACC base current (in amperes) in the "9999.999E±9" format.

Example SOUR4:CURR:ACCB?

See also OUTP:STAB?

SOURce:CURRent:CHANnel?

Description This query returns the calibrated current of the current channel (in amperes).

Syntax SOUR(0..26):CURR:CHAN?

Response A value representing the calibrated current of the current channel (in amperes) in the "9999.999E±9" format.

Example SOUR4:CURR:CHAN?

See also OUTP:SOUR:ACCO

SOURce:CURRent:CHBAse?

Description This query returns the channel base current (in amperes).

Syntax SOUR(0..26):CURR:CHBA?

Response A value representing the base current of the current channel (in amperes) in the "9999.999E±9" format.

Example SOUR4:CURR:CHBA?

See also SOUR:CURR:ACCB

SOURce:CURRent:LEVel?

Description This query returns the delta current of the current channel (in amperes).

Syntax SOUR(0..26):CURR:LEV?

Response A value representing the delta current of the current channel (in amperes) in the "9999.999E±9" format.

Example SOUR4:CURR:LEV?

See also SOUR:CURR:ACCB, SOUR:POW:LEV?, SOURCE:TEMP:LEV?, and SOUR:WAV:LEV?.

SOURce:CURRent:LIMit:HIGH?

Description This query returns the maximum delta current (in amperes) used with the OUTP:SOUR:ACCO command.

Syntax SOUR(0..26):CURR:LIM:HIGH?

Response A value representing the maximum delta current (in amperes) in the "+9999.999E±9" format. The return value will be positive.

Example SOUR4:CURR:LIM:HIGH?

See also OUTP:SOUR:ACCO, SOUR:CURR:LIM:LOW?, and SOUR:CURR:LIM:STEP?

SOURce:CURRent:LIMit:LOW?

Description This query returns the minimum delta current (in amperes) used with the OUTP:SOUR:ACCO command.

Syntax SOUR(0..26):CURR:LIM:LOW?

Response A value representing the minimum delta current (in amperes) in the "-9999.999E±9" format. The return value will be negative.

Example SOUR4:CURR:LIM:LOW?

See also OUTP:SOUR:ACCO, SOUR:CURR:CHAN?, SOUR:CURR:LIM:HIGH?, and SOUR:CURR:LIM:STEP?

SOURce:CURRent:LIMit:STEP?

Description This query returns the minimum step available (in amperes) when changing the laser current with the OUTP:SOUR:ACCO command.

Syntax SOUR(0..26):CURR:LIM:STEP?

Response A value representing the minimum step available (in amperes) in the "9999.999E±9" format.

Note An attempt to change the laser current by a quantity less than the minimum step will be ignored.

Example SOUR4:CURR:LIM:STEP?

See also OUTP:SOUR:ACCO, SOUR:CURR:LIM:HIGH?, and SOUR:CURR:LIM:LOW?

SOURce:POWer:CHANnel?

Description This query returns the channel calibrated output power (in W or in dBm depending on the current power unit).

Syntax SOUR(0..26):POW:CHAN?

Response A value representing the channel calibrated output power (in W or in dBm depending on the current power unit) in the "9999.999E±9" format.

Example SOUR4:POW:CHAN?

SOURce:POWer:LEVel?

Description This query returns the channel delta output power (in W or in dBm depending on the current power unit).

Syntax SOUR(0..26):POW:LEV?

Response A value representing the channel delta output power (in W or in dBm depending on the current power unit) in the "9999.999E±9" format.

Example SOUR4:POW:LEV?

See also SOUR:CURR:ACCB, SOUR:CURR:LEV?, SOURCE:TEMP:LEV?, and SOUR:WAV:LEV?.

SOURce:POWer:LIMit:HIGH?

Description This query returns the maximum power at which the output signal can be set (in W or in dBm depending on the current power unit) with the OUTP:SOUR:APCO command.

Syntax SOUR(0..26):POW:LIM:HIGH?

Response A value representing the maximum power at which the output signal can be set (in W or in dBm depending on the current power unit) in the "9999.999E±9" format.

Note To set the signal output power, use the OUTP:SOUR:APCO command.

Example SOUR4:POW:LIM:HIGH?

See also OUTP:SOUR:APCO, SOUR:POW:LIM:LOW?, SOUR:POW:LIM:STEP?, and UNIT:POW

SOURce:POWer:LIMit:LOW?

Description This query returns the minimum power (in W or in dBm depending on the current power unit) that can be used with the OUTP:SOUR:APCO command.

Syntax SOUR(0..26):POW:LIM:LOW?

Response A value representing the minimum power (in W or in dBm depending on the current power unit) in the "±9999.999E±9" format.

Note To set the signal output power, use the OUTP:SOUR:APCO command.

Example SOUR4:POW:LIM:LOW?

See also OUTP:SOUR:APCO, SOUR:POW:LIM:HIGH?, SOUR:POW:LIM:STEP?, and UNIT:POW

SOURce:POWer:LIMit:STEP?

Description This query returns the minimum step (in W or in dBm depending on the current power unit) that can be used when changing the power with the OUTP:SOUR:APCO command.

Syntax SOUR(0..26):POW:LIM:STEP?

Response A value representing the minimum power step (in W or in dBm depending on the current power unit) in the "9999.999E±9" format.

Note An attempt to change the output power by a quantity less than the minimum step will be ignored.

Example SOUR4:POW:LIM:STEP?

See also OUTP:SOUR:APCO, SOUR:POW:LIM:HIGH?, SOUR:POW:LIM:LOW?, and UNIT:POW

SOURce:PULM:INTernal:DEPTh

Description This command is used to set the dither modulation signal depth (in amperes). If the module is not in Dither modulation mode, this command will have no effect.

Syntax SOUR(0..26):PULM:INT:DEPT<space><numeric>

Parameters The <numeric> parameter represents the new dither modulation signal depth (in amperes) in the "±9.999E+9" format.

Example SOUR4:PULM:INT:DEPT 0.001

See also SOUR:PULM:INT:DEPT?, SOUR:PULM:LIM:DEPT:HIGH?, SOUR:PULM:LIM:DEPT:LOW?, and SOUR:PULM:LIM:DEPT:STEP?

SOURce:PULM:INTernal:DEPTh?

Description This query returns the dither modulation signal depth (in amperes). If the module is not in Dither modulation mode, the return value is undefined.

Syntax SOUR(0..26):PULM:INT:DEPT?

Response A value representing the current dither modulation signal depth (in amperes) in the "9999.999E+9" format.

Example SOUR4:PULM:INT:DEPT?

See also SOUR:PULM:INT:DEPT, SOUR:PULM:LIM:DEPT:HIGH?, SOUR:PULM:LIM:DEPT:LOW?, and SOUR:PULM:LIM:DEPT:STEP?

SOURce:PULM:INTernal:FREQuency

Description This command is used to set the frequency (in Hz) of the internal dither or On/Off modulation signal. If the module is not in Dither or On/Off modulation mode, this command will have no effect.

Syntax SOUR(0..26):PULM:INT:FREQ<space><numeric>

Parameters The <numeric> parameter represents the new frequency (in Hz) of the internal dither or On/Off modulation signal in the "9.999E+9" format.

If the frequency you want to set is to be used in Dither modulation mode, make sure it is equal to or greater than the value returned by SOUR:PULM:LIM:FREQ:DMIN? query and equal to or smaller than the value returned by SOUR:PULM:LIM:FREQ:DMAX?

If the frequency you want to set is to be used in On/Off modulation mode, make sure it is equal to or greater than the value returned by SOUR:PULM:LIM:FREQ:OMIN? and equald to or smaller than the value returned by SOUR:PULM:LIM:FREQ:OMAX?

Example SOUR4:PULM:INT:FREQ 1000

See also SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:OMIN?, SOUR:PULM:LIM:FREQ:RANGE?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:INTernal:FREQuency?

Description This query returns the frequency (in Hz) of the internal dither or On/Off modulation signal. If the module is not in Dither or On/Off modulation mode, the return value is undefined.

Syntax SOUR(0..26):PULM:INT:FREQ?

Response A value representing the internal dither or On/Off modulation signal (in Hz) in the "999999.9" format.

Example SOUR4:PULM:INT:FREQ?

See also SOUR:PULM:INT:FREQ, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:OMIN?, SOUR:PULM:LIM:FREQ:RANGE?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:INTernal:SHAPe

Description This command is used to set the shape of the internal dither modulation signal. If the module is not in Dither modulation mode, this command will have no effect.

Syntax SOUR(0..26):PULM:INT:SHAP<space><shape>

Parameters The <shape> parameter is an integer representing the new shape of the internal dither modulation signal:
"0" -set a square wave
"1" -set a sawtooth wave

Example SOUR4:PULM:INT:SHAP 1

SOURce:PULM:INTernal:SHAPe?

Description This query returns the shape of the internal dither modulation signal. If the module is not in Dither modulation mode, the return value is undefined.

Syntax SOUR(0..26):PULM:INT:SHAP?

Response An integer representing the current shape of the internal dither modulation signal:
"1" -indicate a sawtooth wave shape
"0" -indicate a square wave shape

Example SOUR4:PULM:INT:SHAP?

SOURce:PULM:LIMit:DEPTh:HIGH?

Description This query returns the maximum depth at which the dither modulation signal can be set (in amperes) with the SOUR:PULM:INT:DEPT command.

Syntax SOUR(0..26):PULM:LIM:DEPT:HIGH?

Response A value representing the maximum depth at which the dither modulation signal can be set (in amperes) in the "9999.999E±9" format.

Note To set the dither modulation signal depth, use the SOUR:PULM:INT:DEPT command.

Example SOUR4:PULM:LIM:DEPT:HIGH?

See also SOUR:PULM:INT:DEPT, SOUR:PULM:INT:DEPT?, SOUR:PULM:LIM:DEPT:LOW?, and SOUR:PULM:LIM:DEPT:STEP?

SOURce:PULM:LIMit:DEPTh:LOW?

Description This query returns the minimum depth at which the dither modulation signal can be set (in amperes) with the SOUR:PULM:INT:DEPT command.

Syntax SOUR(0..26):PULM:LIM:DEPT:LOW?

Response A value representing the minimum depth at which the dither modulation signal can be set (in amperes) in the "9999.999E±9" format.

Note To set the dither modulation signal depth, use the SOUR:PULM:INT:DEPT command.

Example SOUR4:PULM:LIM:DEPT:LOW?

See also SOUR:PULM:INT:DEPT, SOUR:PULM:INT:DEPT?, SOUR:PULM:LIM:DEPT:HIGH?, and SOUR:PULM:LIM:DEPT:STEP?

SOURce:PULM:LIMit:DEPTh:STEP?

Description This query returns the minimum step available (in amperes) when changing the dither modulation signal depth with the SOUR:PULM:INT:DEPT command.

Syntax SOUR(0..26):PULM:LIM:DEPT:STEP?

Response A value representing the minimum step available for the dither modulation signal depth (in amperes) in the "9999.999E±9" format.

Note The step is an indication of the module sensitivity. An attempt to change the dither modulation signal depth by a quantity less than the minimum step will be ignored.

Example SOUR4:PULM:LIM:DEPT:STEP?

See also SOUR:PULM:INT:DEPT, SOUR:PULM:INT:DEPT?, SOUR:PULM:LIM:DEPT:HIGH?, and SOUR:PULM:LIM:DEPT:LOW?

SOURce:PULM:LIMit:FREQuency:DMAX?

Description This query returns the maximum modulation frequency possible in Dither mode (in Hz).

Syntax SOUR(0..26):PULM:LIM:FREQ:DMAX?

Response A value representing the maximum modulation frequency possible in Dither mode (in Hz) in the "999999" format.

Example SOUR4:PULM:LIM:FREQ:DMAX?

See also SOUR:PULM:INT:FREQ, SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:OMIN?, SOUR:PULM:LIM:FREQ:RANGE?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:LIMit:FREQuency:DMIN?

Description This query returns the minimum modulation frequency possible in Dither mode (in Hz).

Syntax SOUR(0..26):PULM:LIM:FREQ:DMIN?

Response A value representing the minimum modulation frequency possible in Dither mode (in Hz) in the "999999" format.

Example SOUR4:PULM:LIM:FREQ:DMIN?

See also SOUR:PULM:INT:FREQ, SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:OMIN?, SOUR:PULM:LIM:FREQ:RANGE?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:LIMit:FREQuency:HIGH?

Description The available modulation frequencies may be divided into more than one range. Each range has a minimum frequency, a maximum and a step. This query returns the maximum frequency (in Hz) at which the internal dither or On/Off modulation signal can be set for the specified range with the SOUR:PULM:INT:FREQ command.

Syntax SOUR(0..26):PULM:LIM:FREQ:HIGH?<space><rangeIndex>

Parameter The <rangeIndex> parameter represents the index of the range in the "9" format. The smallest index is 0.

Response A value representing the maximum modulation frequency of the range that was used as a parameter, in the "999999.9" format.

Note In Dither modulation mode, make sure that this value does not exceed the value returned by SOUR:PULM:LIM:FREQ:DMAX, which is the maximum dither modulation frequency. In On/Off modulation, make sure that this value does not exceed the value returned by SOUR:PULM:LIM:FREQ:OMAX.

To set the the frequency of the internal dither or On/Off modulation signal, use the SOUR:PULM:INT:FREQ command.

Example SOUR4:PULM:LIM:FREQ:HIGH? 0

See also SOUR:PULM:INT:FREQ, SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:OMIN?, SOUR:PULM:LIM:FREQ:RANGE?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:LIMit:FREQuency:LOW?

Description The available modulation frequencies may be divided into more than one range. Each range has a mimimum frequency, a maximum and a step. This query returns the minimum frequency (in Hz) at which the internal dither or On/Off modulation signal can be set for the specified range with the SOUR:PULM:INT:FREQ command.

Syntax SOUR(0..26):PULM:LIM:FREQ:LOW?<space><rangeIndex>

Parameter The <rangeIndex> parameter represents the index of the range in the "9" format. The smallest index is 0.

Response A value representing the minimum frequency (in Hz) at which the internal dither or On/Off modulation signal can be set for the specified range, in the "999999.9" format.

Note In Dither modulation mode, make sure that this value is not smaller than the value returned by SOUR:PULM:LIM:FREQ:DMIN?, which is the minimum dither modulation frequency. In On/Off modulation, make sure that this value is not smaller than the value returned by SOUR:PULM:LIM:FREQ:OMIN?.

To set the the frequency of the internal dither or On/Off modulation signal, use the SOUR:PULM:INT:FREQ command.

Example SOUR4:PULM:LIM:FREQ:LOW? 0

See also SOUR:PULM:INT:FREQ, SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:OMIN?, SOUR:PULM:LIM:FREQ:RANGE?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:LIMit:FREQuency:OMAX?

Description This query returns the maximum modulation frequency possible in On/Off mode (in Hz).

Syntax SOUR(0..26):PULM:LIM:FREQ:OMAX?

Response A value representing the maximum modulation frequency possible in On/Off mode (in Hz) in the "999999" format.

Example SOUR4:PULM:LIM:FREQ:OMAX?

See also SOUR:PULM:INT:FREQ, SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMIN?, SOUR:PULM:LIM:FREQ:RANGE?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:LIMit:FREQuency:OMIN?

Description This query returns the minimum modulation frequency possible in On/Off mode (in Hz).

Syntax SOUR(0..26):PULM:LIM:FREQ:OMIN?

Response A value representing the minimum modulation frequency possible in On/Off mode (in Hz) in the "999999" format.

Example SOUR4:PULM:LIM:FREQ:OMIN?

See also SOUR:PULM:INT:FREQ, SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:RANGE?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:LIMit:FREQuency:RANGe?

Description This query returns the number of modulation frequency ranges. The smallest range is 0.

Syntax SOUR(0..26):PULM:LIM:FREQ:RANG?

Response A value representing the number of modulation frequency ranges in the "9" format.

Example SOUR4:PULM:LIM:FREQ:RANG?

See also SOUR:PULM:INT:FREQ, SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:OMIN?, and SOUR:PULM:LIM:FREQ:STEP?

SOURce:PULM:LIMit:FREQuency:STEP?

Description The available modulation frequencies may be divided into more than one range. Each range has a mimimum frequency, a maximum and a step. This query returns the minimum step available for the specified range (in Hz) when changing the frequency with the SOUR:PULM:INT:FREQ command.

Syntax SOUR(0..26):PULM:LIM:FREQ:STEP?<space><rangeIndex>

Parameter The <rangeIndex> parameter represents the index of the range in the "9" format. The smallest index is 0.

Response A value representing the minimum step available for the specified range of frequencies (in Hz) in the "999999.9" format.

Note An attempt to change the frequency by less than the minimum step will be ignored.

Example SOUR4:PULM:LIM:FREQ:STEP? 0

See also SOUR:PULM:INT:FREQ, SOUR:PULM:INT:FREQ?, SOUR:PULM:LIM:FREQ:DMAX?, SOUR:PULM:LIM:FREQ:DMIN?, SOUR:PULM:LIM:FREQ:HIGH?, SOUR:PULM:LIM:FREQ:LOW?, SOUR:PULM:LIM:FREQ:OMAX?, SOUR:PULM:LIM:FREQ:OMIN?, and SOUR:PULM:LIM:FREQ:RANGE?

SOURce:PULM:SOURce

Description This command is used to set the source of the modulation signal (Internal or External). If the module is not in On/Off modulation mode, this command will have no effect.

Syntax SOUR(0..26):PULM:SOUR<space><modul>

Parameters The <modul> parameter represents the new source of the modulation signal:

"0" or "INT" -set Internal modulation
"1" or "EXT" -set External modulation

Note A dither modulation signal may only be used with Internal synchronization. When you choose Normal with Dither modulation mode, the source will automatically be set to Internal. On/Off modulation may be used with Internal or External synchronization. To use the Internal On/Off modulation signal, this parameter must be set to Internal. To use an External On/Off modulation signal, this parameter must be set to External, and the desired signal must be sent to the appropriate input.

If the module is in Dither modulation mode and you try to set the source to External, the "Invalid mode" error message will be raised.

Example SOUR4:PULM:SOUR 1

SOURce:PULM:SOURce?

Description This query returns the current source of the modulation signal (Internal or External). If the module is not in Dither or On/Off modulation mode, the return value is undefined. If the module is in Dither modulation mode, the return value will always be 1.

Syntax SOUR(0..26):PULM:SOUR?

Response A value representing the current source of the modulation signal (Internal or External):
"0" -source set to Internal modulation
"1" -source set to External modulation

Example SOUR4:PULM:SOUR?

SOURce:TEMPerature:CHANnel?

Description This query returns the channel calibrated temperature (in °C).

Syntax SOUR(0..26):TEMP:CHAN?

Response A value representing the calibrated temperature of the current channel (in °C) in the "±99.99" format.

Example SOUR4:TEMP:CHAN?

See also OUTP:SOUR:ACCO

SOURce:TEMPerature:LEVel?

Description This query returns the channel delta temperature (in °C).

Syntax SOUR(0..26):TEMP:LEV?

Response A value representing the delta temperature of the current channel (in °C) in the "±99.99" format, between.

Example SOUR4:TEMP:LEV?

See also SOUR:CURR:ACCB, SOUR:CURR:LEV?, SOURCE:POW:LEV?, and SOUR:WAV:LEV?.

SOURce:TEMPerature:LIMit:HIGH?

Description This query returns the maximum value at which the delta temperature (in °C) can be set with the OUTP:SOUR:ACCO command.

Syntax SOUR(0..26):TEMP:LIM:HIGH?

Response A value representing the maximum value at which the delta temperature (in °C) can be set in the "+99.99" format. The return value will be positive.

Example SOUR4:TEMP:LIM:HIGH?

See also OUTP:SOUR:ACCO, SOUR:TEMP:CHAN?, SOUR:TEMP:LIM:LOW?, and SOUR:TEMP:LIM:STEP?

SOURce:TEMPerature:LIMit:LOW?

Description This query returns the minimum value at which the delta temperature can be set (in °C) with the OUTP:SOUR:ACCO command.

Syntax SOUR(0..26):TEMP:LIM:LOW?

Response A value representing the minimum value at which the delta temperature (in °C) can be set in the "-99.99" format. The return value will be negative.

Example SOUR4:TEMP:LIM:LOW?

See also OUTP:SOUR:ACCO, SOUR:TEMP:CHAN?, SOUR:TEMP:LIM:HIGH?, and SOUR:TEMP:LIM:STEP?

SOURce:TEMPerature:LIMit:STEP?

Description This query returns the minimum step available (in °C) when changing the temperature with the OUTP:SOUR:ACCO command.

Syntax SOUR(0..26):TEMP:LIM:STEP?

Response A value representing the minimum step available (in °C) for the temperature in the "99.99" format.

Note An attempt to change the temperature by a quantity less than the minimum step will be ignored.

Example SOUR4:TEMP:LIM:STEP?

See also OUTP:SOUR:ACCO, SOUR:TEMP:LIM:HIGH?, and SOUR:TEMP:LIM:LOW?

SOURce:WAVelength:CHANnel?

Description Depending on the current spectral setting, this query returns the calibrated wavelength (in nm) or central channel frequency (in THz).

Syntax SOUR(0..26):WAV:CHAN?

Response A value representing the calibrated central wavelength of the channel in the "9999.99" (nm) or "999.999" (THz) format.

Example SOUR4:WAV:CHAN?

SOURce:WAVelength:LEVel?

Description Depending on the current spectral setting, this query returns the actual wavelength (in nm) or central channel frequency (in THz).

Syntax SOUR(0..26):WAV:LEV?

Response A value representing the actual central wavelength of the channel in the "9999.99" (nm) or "999.999" (THz) format.

Example SOUR4:WAV:LEV?

See also SOUR:CURR:ACCB, SOUR:CURR:LEV?, SOURCE:POW:LEV?, and SOUR:TEMP:LEV?.

SOURce:WAVelength:LIMit:HIGH?

Description Depending on the current spectral unit, this query returns the maximum wavelength (in nm) or the minimum frequency (in THz) at which the laser can be set with the OUTP:SOUR:APCO command.

Syntax SOUR1:WAV:LIM:HIGH?

Response A value in the "9999.99" (nm) or "999.99" (THz) format.

Example SOUR4:WAV:LIM:HIGH?

See also OUTP:SOUR:APCO, SOUR:WAV:LIM:LOW?, SOUR:WAV:LIM:STEP?, and UNIT:WAV

SOURce:WAVelength:LIMit:LOW?

Description Depending on the current spectral unit, this query returns the minimum wavelength (in nm) or the maximum frequency (in THz) at which the laser can be set with the OUTP:SOUR:APCO command.

Syntax SOUR(0..26):WAV:LIM:LOW?

Response A value in the "9999.99" (nm) or "999.99" (THz) format.

Example SOUR4:WAV:LIM:LOW?

See also OUTP:SOUR:APCO, SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:STEP?, and UNIT:WAV

SOURce:WAVelength:LIMit:STEP?

Description This query returns the minimum step available when changing the output wavelength (or frequency). Depending on the current spectral unit, the return value will be in nanometers (nm) or in terahertz (THz).

Syntax SOUR(0..26):WAV:LIM:STEP?

Response A value in the "9999.99" (nm) or "999.99" (THz) format.

Note An attempt to change the output by a quantity less than the minimum step will be ignored.

Example SOUR4:WAV:LIM:STEP?

See also OUTP:SOUR:APCO, SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:LOW?, and UNIT:WAV

UNIT:POWer

Description This command is used to set the power unit (dBm or W).

Syntax UNIT(0..26):POW<space><unit>

Parameters The <unit> parameter represents the new spectral unit:
"0" or "DB" -select dBm
"1" or "W" -select W

Example UNIT4:POW 1

See also OUTP:SOUR:APCO, SOUR:POW:LIM:HIGH?, SOUR:POW:LIM:LOW?, and SOUR:POW:LIM:STEP?

UNIT:WAVelength

Description This command is used to set the spectral unit (nanometers or terahertz).

Syntax UNIT(0..26):WAV<space><unit>

Parameters The <unit> parameter represents the new spectral unit:
"0" or "NM" -select nanometers
"1" or "THZ" -select terahertz

Example UNIT4:WAV 1

See also OUTP:SOUR:APCO, SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:LOW?, and SOUR:WAV:LIM:STEP?

IQ-2400 WDM Laser Source Operation Modes

The IQ-2400 offers four different source operation modes: Normal, High Wavelength Stability, Dither modulation, and On/Off modulation.

Output Signal	Without Modulation	With Modulation
Automatic current control	High Wavelength Stability mode	On/Off modulation mode
Automatic current control from monitor	Normal mode	Dither modulation mode

Table 7-3. Output Signal vs. Modulation Mode

Normal Mode

Normal mode is used to maximize output power stability. This mode is the default, meaning that it is used to tune wavelength and power throughout their respective ranges (2 nm for wavelength and 10 dB for power). To maintain power at the specified level, the monitor current at the rear end of the laser will be held constant. Laser current intensity is adjusted in real time to produce a constant output power. Since peak wavelength varies with laser current intensity, the emission spectrum is slightly enlarged.

High Wavelength Stability Mode

High Wavelength Stability mode is used when central wavelength stability is critical. In High Wavelength Stability mode, current is constant thus maintaining wavelength stability. Once power and wavelength have been set to the required levels (in Normal mode), choose High Wavelength Stability mode to enhance wavelength stability at the established value. A limited tuning range is permitted around this value (±1°C for wavelength or ±1 mA for current). Power stability can be enhanced after a very long stabilization period (typically 2 days).

Dither Modulation Mode

This mode is a combination of Normal mode and Dithering. In dither modulation, the user can have a 1 mA to 5 mA tone (dithering), which can either be a square or triangle wave.

In Dither modulation mode,

- you can set the modulation frequency (using the SOUR:PULM:INT:FREQ command)
- you can set the dither depth (using the SOUR:PULM:INT:DEPT command)
- you can set the dither shape (using the SOUR:PULM:INT:SHAP command)
- the modulation is internal

On/Off Modulation Mode

On/Off Modulation (50% duty cycle) halves the average power available from the source module. This mode controls current during the "on" cycle of the signal. The tuning range for temperature and current are the same as in High Wavelength Stability mode.

In On/Off modulation mode, you can

- set the modulation frequency (using the SOUR:PULM:INT:FREQ command)
- set the source of the modulation signal (using the SOUR:PULM:SOUR command)

Signal Modulation

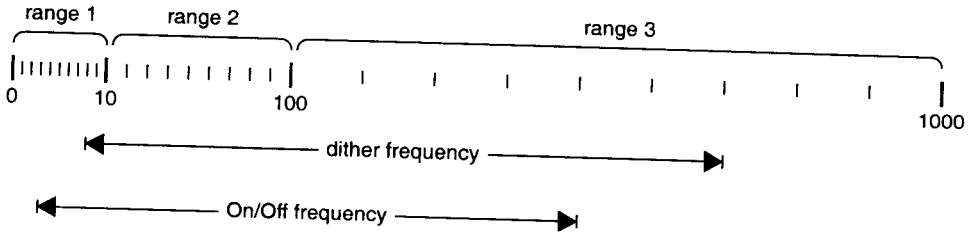
Available Modulation Frequencies

The modulation frequencies available on the IQ-2400 WDM Laser Source may be divided into ranges. Each range has its own resolution (i.e., minimum step between the available frequencies). The following figure illustrates how frequencies are divided (the figure uses fake numbers and is not to scale).

So in this particular example,

- the SOUR:PULM:LIM:FREQ:RANG? query would return "3" (the number of frequency ranges)
- the SOUR:PULM:LIM:FREQ:LOW? query for range 2 would return "20" (the lower limit of the specified range)
- the SOUR:PULM:LIM:FREQ:HIGH? query for range 2 would return "100" (the upper limit of the specified range)
- the SOUR:PULM:LIM:FREQ:STEP? query for range 2 would return "10" (the resolution of the specified range).

In fact, not all the modulation frequencies are available in Dither and On/Off modulation modes. The following figure illustrates how the modulation frequencies available in Dither and On/Off modulation modes could be distributed (the figure uses fake numbers and is not to scale).



So in this particular example,

- the SOUR:PULM:LIM:FREQ:DMIN? query would return "8" (the minimum frequency available in Dither modulation mode)
- the SOUR:PULM:LIM:FREQ:DMAX? query would return "700" (the maximum frequency available in Dither modulation mode)

- the SOUR:PULM:LIM:FREQ:OMIN? query would return "3" (the minimum frequency available in On/Off modulation mode)
- the SOUR:PULM:LIM:FREQ:OMAX? query would return "500" (the maximum frequency available in On/Off modulation mode)

Setting the Modulation Frequency

So when you want to set a specific frequency,

1. Find out in how many ranges the modulation frequencies are divided (using the SOUR:PULM:LIM:FREQ:RANG? query).
2. Find out in which range is the frequency you want to set (using the SOUR:PULM:LIM:FREQ:LOW? and the SOUR:PULM:LIM:FREQ:HIGH? queries).
3. Find out the resolution of the range that contains the frequency you want to set (using the SOUR:PULM:LIM:FREQ:STEP? query).
4. Verify that the frequency you want to set respects the resolution of its range. If you attempt to set a frequency that is not available, the signal will be modulated at the closest available frequency.
5. If the frequency you want to set is to be used in Dither modulation mode, make sure it is equal to or greater than the value returned by SOUR:PULM:LIM:FREQ:DMIN? and equal to or smaller than the value returned by the SOUR:PULM:LIM:FREQ:DMAX? query.

   If the frequency you want to set is to be used in On/Off modulation mode, make sure it is equal to or greater than the value returned by SOUR:PULM:LIM:FREQ:OMIN? and equal to or smaller than the value returned by the SOUR:PULM:LIM:FREQ:OMAX? query.
6. Set the module to the desired modulation mode (using the OUTP:SOUR:MODE command).
7. Enter the desired modulation frequency (using the SOUR:PULM:INT:FREQ command).

Setting the Source of the Modulation

In On/Off modulation mode, you can select the source of the modulation (internal or external). In Dither modulation mode, the source of the modulation can only be internal.

To set the source of the modulation, use the SOUR:PULM:SOUR command. To find out the present source of the modulation, use the SOUR:PULM:SOUR? query.

Setting the Depth of the Dither Modulation Signal

In Dither modulation mode, you can select the depth of the dither modulation signal, using the SOUR:PULM:INT:DEPT command. To determine valid parameters for the dither modulation depth, use the SOUR:PULM:LIM:DEPT:HIGH?, SOUR:PULM:LIM:DEPT:LOW?, and SOUR:PULM:LIM:DEPT:STEP? queries.

To find out the present depth of the dither modulation, use the SOUR:PULM:INT:DEPT? query.

Setting the Shape of the Dither Modulation Signal

In Dither modulation mode, you can select the shape of the modulation (square or sawtooth). To set the shape of the modulation, use the SOUR:PULM:INT:SHAP command. To find out the present shape of the modulation, use the SOUR:PULM:INT:SHAP? query.

Source Parameters

Source parameters available for modification depend on the active source operation mode mode. To set the source operation mode, use the OUTP:SOUR:MODE command. To find out the present source operation mode, use the OUTP:SOUR:MODE? query.

Source Operation in Normal Mode

The Normal mode (Normal mode and Dither modulation mode) is the source operation mode used most of the time. It allows you to adjust the spectral value (wavelength or frequency) and source power.

To adjust the spectral value and source power, use the OUTP:SOUR:APCO command. To determine valid spectral value parameters, use the SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:LOW?, and SOUR:WAV:LIM:STEP? queries. To determine valid source power parameters, use the SOUR:POW:LIM:HIGH?, SOUR:POW:LIM:LOW?, and SOUR:POW:LIM:STEP? queries.

To find out the present spectral setting, use the SOUR:WAV:LEV? query. To find out the present source power setting, use the SOUR:POW:LEV? query.

Source Operation in High Wavelength Stability Mode

Once the power and wavelength have been set to the desired levels in Normal mode, you can switch to High Wavelength Stability mode (High Wavelength Stability mode and On/Off modulation mode) to fine tune wavelength and power settings. By doing this, you enhance wavelength stability.

When you switch from Normal mode to HWS mode, the present laser temperature is recorded as the base temperature. To fine tune the wavelength, you can adjust the laser temperature by ±1°C around the base temperature. The temperature offset from the base temperature is called delta temperature.

Also, when you switch from Normal mode to HWS mode, the present laser current is recorded as the base current. To fine tune the power, you can adjust the laser current by ±1 mA around the base current. The current offset from the base current is called delta current.

To adjust the delta temperature and the delta current, use the OUTP:SOUR:ACCO command. To determine valid delta temperature parameters, use the SOUR:TEMP:LIM:HIGH?, SOUR:TEMP:LIM:LOW?, and SOUR:TEMP:LIM:STEP? queries. To determine valid delta current parameters, use the SOUR:CURR:LIM:HIGH?, SOUR:CURR:LIM:LOW?, and SOUR:CURR:LIM:STEP? queries.

To find out the present delta temperature setting, use the SOUR:TEMP:LEV? query. To find out the present delta current setting, use the SOUR:CURR:LEV? query.

Using Setpoints

Setpoints are source settings to which the user often needs to return with great accuracy. From EXFO's IQ application software, it is easy to create and manage setpoints (refer to the *IQ Source Series* instruction manual). To return to a setpoint existing in EXFO's IQ application software, use the OUTP:SOUR:SETP command.

To create a setpoint using the SCPI commands, you need to set the source to the point where you want to return, and then record the source parameters at that point. So whenever you want to return to this setpoint, you just have to re-enter the recorded source parameters.

To create a setpoint using the SCPI commands,

1. Set the IQ-2400 to Normal mode (using the OUTP:SOUR:MODE command).
2. Adjust the source wavelength and power (using the OUTP:SOUR:APCO command).
3. Record the source wavelength obtained with the SOUR:WAV:LEV? query.
4. Record the source power obtained with the SOUR:POW:LEV? query.
5. Switch to High Wavelength Stability mode (using the OUTP:SOUR:MODE command).
6. Adjust the source temperature and current (using the OUTP:SOUR:ACCO command).
7. Record the base current obtained with the SOUR:CURR:ACCB? query.
8. Record the delta temperature obtained with the SOUR:TEMP:LEV? query.
9. Record the delta current obtained with the SOUR:CURR:LEV? query.

To return to a setpoint created using the SCPI commands,

1. Set the IQ-2400 to Normal mode (using the OUTP:SOUR:MODE command).

2. Adjust the source wavelength and power to previously recorded values (using the OUTP:SOUR:APCO command).
3. Switch to High Wavelength Stability mode (using the OUTP:SOUR:MODE command).
4. Adjust the base current to the previously recorded value (using the SOUR:CURR:ACCB command).
5. Adjust the source temperature and current to previously recorded values (using the OUTP:SOUR:ACCO command).

Central Wavelength

Each IQ-2400 WDM Laser Source module is designed to generate a signal at one central wavelength. EXFO attributes an identification number to the central wavelength. To find out the central wavelength identification number of your module, use the INP:CHAN? query. The following table lists the possible identification numbers and the corresponding central wavelengths:

Identification number	Wavelength
92	1525.66
93	1526.44
94	1527.22
95	1527.99
96	1528.77
97	1529.55
98	1530.33
99	1531.12
00	1531.90
01	1532.68
02	1533.47
03	1534.25

Table 7-4. Wavelength vs. Identification Number (Part 1 of 3)

Identification number	Wavelength
04	1535.04
05	1535.82
06	1536.61
07	1537.40
08	1538.19
09	1538.98
10	1539.77
11	1540.56
12	1541.35
13	1542.14
14	1542.94
15	1543.73
16	1544.53
17	1545.32
18	1546.12
19	1546.92
20	1547.72
21	1548.51
22	1549.32
23	1550.12
24	1550.92
25	1551.72
26	1552.52
27	1553.33
28	1554.13
29	1554.94
30	1555.75
31	1556.55

Table 7-4. Wavelength vs. Identification Number (Part 2 of 3)

Identification number	Wavelength
32	1557.36
33	1558.17
34	1558.98
35	1559.79
36	1560.61
37	1561.42
38	1562.23
39	1563.05
40	1563.86
41	1564.68
42	1565.50
43	1566.31
44	1567.13
45	1567.95
46	1568.77

Table 7-4. Wavelength vs. Identification Number (Part 3 of 3)

When you want to return to the module central wavelength, you do the same as for any setpoint: you find out the source parameters necessary to attain the central wavelength and then set these parameters.

To find out the parameters necessary to attain the central wavelength,

1. Record the source wavelength obtained with the SOUR:WAV:CHAN? query.
2. Record the source power obtained with the SOUR:POW:CHAN? query.
3. Record the base current obtained with the SOUR:CURR:CHBA? query.
4. Record the delta temperature obtained with the SOUR:TEMP:CHAN? query.
5. Record the delta current obtained with the SOUR:CURR:CHAN? query.

To set the central wavelength,

1. Set the IQ-2400 to Normal mode (using the OUTP:SOUR:MODE command).
2. Adjust the source wavelength and power to previously recorded values (using the OUTP:SOUR:APCO command).
3. Switch to High Wavelength Stability mode (using the OUTP:SOUR:MODE command).
4. Adjust the base current to the previously recorded value (using the SOUR:CURR:ACCB command).
5. Adjust the source temperature and current to previously recorded values (using the OUTP:SOUR:ACCO command).

IQ-2600 Tunable Laser Source Commands

OUTPut:ASE?

Description This query returns a value indicating whether the ASE option is available on the tunable laser source module.

Syntax OUTP(0..26):ASE?

Response A boolean value indicating whether the ASE option is available on the tunable laser source module:
"0" -the ASE option is not available
"1" -the ASE option is available

Example OUTP4:ASE?

See also OUTP:MODE and OUTP:MODE?

OUTPut:MODE

Description This command is used to set the source mode (Tunable or ASE).

Syntax OUTP(0..26):MODE<space><mode>

Parameters The <mode> parameter is a boolean parameter representing the source mode:
"0" -set Tunable mode
"1" -set ASE mode

Note This command cannot be performed if the module is in Program or Sweep mode.

Example OUTP4:MODE 1

See also OUTP:ASE? and OUTP:MODE?

OUTPut:MODE?

Description This query returns the current source mode (Tunable or ASE).

Syntax OUTP(0..26):MODE?

Response A boolean value representing the current source mode:
"0" -the source is in Tunable mode
"1" -the source is in ASE mode

Example OUTP4:MODE?

See also OUTP:ASE? and OUTP:MODE

OUTPut:STATe

Description This command is used to activate or deactivate the source.

Syntax OUTP(0..26):STAT<space><state>

Parameters The <state> parameter is a boolean parameter representing the source state:
"0" -deactivate the source
"1" -activate the source

Example OUTP4:STAT 1

OUTPut:STATe?

Description This query returns the current source state.

Syntax OUTP(0..26):STAT?

Response A boolean value representing the current source state:
"0" -the source is deactivated
"1" -the source is activated

Example OUTP4:STAT?

PROGram:SELected:NAME

Description This command is used to load a program.

Syntax PROG(0..26):SEL:NAME<space><progname>

Parameters The <progname> parameter represents the full DOS path and name of the tunable laser source program file to load.

Note This command cannot be performed if the application is running in ASE or Sweep mode.

Example PROG4:SEL:NAME C:\IQ\2600\PROG0026.PRG

PROGram:SELected:NAME?

Description This query returns the full DOS path and name of the currently loaded program file.

Syntax PROG(0..26):SEL:NAME?

Response The full DOS path and name of the currently loaded tunable laser source program file.

Example PROG4:SEL:NAME?

PROGram:SELected:STATe

Description This command controls the state of the currently loaded program.

Syntax PROG(0..26):SEL:STAT<space><progstate>

Parameters The <progstate> parameter represents the new program state:
"0" or "RUN" -start the program
"1" or "PAUS" -pause the program
"2" or "STOP" -stop the program
"3" or "CONT"-restart a program after a pause

Note This command cannot be performed if the application is running in ASE or Sweep mode.

Example PROG4:SEL:STAT 3

PROGram:SELected:STATe?

Description This query returns the state of the currently loaded program.

Syntax PROG(0..26):SEL:STAT?

Response The state of the currently loaded program:
"RUNNING" -the program is running
"PAUSE" -the program is paused
"STOP" -the program is stopped
"WAITING" -preprogrammed delay

Example PROG4:SEL:STAT?

SOURce:POWer:LEVel:IMMediate:AMPLitude

Description This command is used to set the source output power (in dBm).

Syntax SOUR(0..26):POW:LEV:IMM:AMPL<space><power>

Parameters The <power> parameter represents the new source output power (in dBm) in the "±99.9" format. The value must be equal to or greater than the value returned by SOUR:POW:LIM:LOW? and equal to or smaller than the value returned by SOUR:POW:LIM:HIGH?

Note This command cannot be performed if the module is in ASE mode. If the entered value is out of range, the closest available value will be selected.

Example SOUR4:POW:LEV:IMM:AMPL 03.4

See also SOUR:POW:LEV:IMM:AMPL?, SOUR:POW:LIM:HIGH?, SOUR:POW:LIM:LOW?, and SOUR:POW:LIM:STEP?

SOURce:POWer:LEVel:IMMediate:AMPLitude?

Description This query returns the source output power (in dBm).

Syntax SOUR(0..26):POW:LEV:IMM:AMPL?

Response The current source output power (in dBm) in the "±99.9" format.

Note When in ASE mode, this command will return an invalid value. In case of no power, the "-----" message is returned.

Example SOUR4:POW:LEV:IMM:AMPL?

See also SOUR:POW:LEV:IMM:AMPL, SOUR:POW:LIM:HIGH?, SOUR:POW:LIM:LOW?, and SOUR:POW:LIM:STEP?

SOURce:POWer:LIMit:HIGH?

Description This query returns the maximum source output power (in dBm) that can be set with the SOUR:POW:LEV:IMM:AMPL command.

Syntax SOUR(0..26):POW:LIM:HIGH?

Response The maximum source output power (in dBm) in the "±99.9" format.

Example SOUR4:POW:LIM:HIGH?

See also SOUR:POW:LEV:IMM:AMPL, SOUR:POW:LEV:IMM:AMPL?, SOUR:POW:LIM:LOW?, and SOUR:POW:LIM:STEP?

SOURce:POWer:LIMit:LOW?

Description This query returns the minimum source output power (in dBm) that can be set with the SOUR:POW:LEV:IMM:AMPL command.

Syntax SOUR(0..26):POW:LIM:LOW?

Response The minimum source output power (in dBm) in the "±99.9" format.

Example SOUR4:POW:LIM:LOW?

See also SOUR:POW:LEV:IMM:AMPL, SOUR:POW:LEV:IMM:AMPL?, SOUR:POW:LIM:HIGH?, and SOUR:POW:LIM:STEP?

SOURce:POWer:LIMit:STEP?

Description This query returns the minimum output power step (in dBm) that can be used when changing the source output power with the SOUR:POW:LEV:IMM:AMPL command.

Syntax SOUR(0..26):POW:LIM:STEP?

Response The minimum output power step (in dBm) in the "±99.9" format.

Example SOUR4:POW:LIM:STEP?

See also SOUR:POW:LEV:IMM:AMPL, SOUR:POW:LEV:IMM:AMPL?, SOUR:POW:LIM:HIGH?, and SOUR:POW:LIM:LOW?

SOURce:SWEep:CENTer?

Description This query returns the center wavelength for the current sweep program in the current spectral unit (nm or THz).

Syntax SOUR(0..26):SWE:CENT?

Response The center wavelength for the current sweep program in the current spectral unit in the "9999.99" (nm) or "999.999" (THz) format.

Example SOUR4:SWE:CENT?

SOURce:SWEep:COUNt

Description This command is used to specify how many times you want the sweep program to loop. To specify whether or not you want the sweep program to loop, use the SOUR:SWE:REPE command.

Syntax SOUR(0..26):SWE:COUN<space><count>

Parameters The <count> parameter represents the new number of loops in the "999" format. For continuous repetition, enter "0".

Example SOUR4:SWE:COUN 132

SOURce:SWEep:COUNt?

Description This query returns the number of repetitions set for the sweep program.

Syntax SOUR(0..26):SWE:COUN?

Response The number of repetitions set for the sweep program. "0" makes the program loop continuously.

Example SOUR4:SWE:COUN?

SOURce:SWEep:PROGram?

Description This function is used to set the parameters for a sweep program. During a sweep program, the application sweeps between two wavelengths: the minimum and the maximum wavelengths. This function also returns the validated parameters.

Syntax SOUR(0..26):SWE:PROG?<space><central>,,<time>

Parameters The <central> parameter represents the center wavelength (the wavelength halfway between the minimum and the maximum wavelengths). The format must be "9999.99" (nm) or "999.999" (THz).

The parameter represents the wavelength range to be swept below and above the center wavelength: span = (max. wavelength – min. wavelength) / 2. The current spectral measurement unit applies (nm or THz). The format must be "9999.99" (nm) or "999.999" (THz).

The <time> parameter represents the duration of the sweep. The format must be "HHHH:MM:SS".

Response A value confirming the new settings. If the entered parameters are not valid, the application will make the necessary changes. The format is "9999.99;99.99;999:99:99" (when the current spectral unit is nm) or "999.999;9.999;9999:99:99" (when the current spectral unit is THz).

Note It is strongly recommended that you perform the SOUR:SWE:REV command before the SOUR:SWE:PROG? query.

Example SOUR4:SWE:PROG? 1552.52,10.00,0000:01:00

SOURce:SWEep:REPeat

Description This command is used to specify whether or not you want the sweep program to loop. The sweep program will loop the number of times set by the SOUR:SWE:COUN command.

Syntax SOUR(0..26):SWE:REP<space><loop>

Parameters The <loop> parameter is a boolean parameter indicating whether or not the sweep program will loop:
"1" -the sweep program will loop
"0" -the sweep program will not loop

Example SOUR4:SWE:REP 1

SOURce:SWEep:REPeat?

Description This query is used to check whether the sweep repeat function is activated. If activated, the sweep program will loop the number of times set by the SOUR:SWE:COUN command.

Syntax SOUR(0..26):SWE:REP?

Response A boolean value indicating the state of the sweep repeat function:
"1" -the sweep repeat function is activated
"0" -the sweep repeat function is deactivated

Example SOUR4:SWE:REP?

SOURce:SWEep:REVerse

Description This command is used to enable and disable the sweep reverse function. When the sweep reverse function is enabled, the sweep program is performed in both directions: in the wavelength ascending and descending order.

Syntax SOUR(0..26):SWE:REV<space><sweep>

Parameters The <sweep> parameter is a boolean parameter indicating whether or not the sweep will be done in both directions:
"1" -enable the sweep reverse function
"0" -disable the sweep reverse function

Example SOUR4:SWE:REV 1

SOURce:SWEep:REVerse?

Description This query returns a value indicating whether the sweep reverse function is enabled.

Syntax SOUR(0..26):SWE:REV?

Response A boolean parameter representing the state of the sweep reverse function:
"1" -the sweep reverse function is enabled
"0" -the sweep reverse function is disabled

Example SOUR4:SWE:REV?

SOURce:SWEep:SPAN?

Description This query returns the wavelength range to be swept below and above the center wavelength.

Syntax SOUR(0..26):SWE:SPAN?

Response A value representing the wavelength range to be swept below and above the center wavelength. The current spectral measurement unit applies (nm or THz). The format is "9999.99" (nm) or "999.999" (THz).

Example SOUR4:SWE:SPAN?

SOURce:SWEep:STATe

Description This function starts or stops the sweep program.

Syntax SOUR(0..26):SWE:STAT<space><state>

Parameters The <state> parameter is a boolean parameter representing the new state of the sweep program:
"1" -start the sweep program
"0" -stop the sweep program

Note This command cannot be performed if the application is running in ASE or Program mode.

Example SOUR4:SWE:STAT 1

SOURce:SWEep:STATe?

Description This query returns a value indicating the state of the sweep program.

Syntax SOUR(0..26):SWE:STAT?

Response A boolean value representing the current state of the sweep program:
"1" -the sweep program is in progress
"0" -the sweep program is not in progress

Example SOUR4:SWE:STAT?

SOURce:SWEep:TIME?

Description This query returns the duration currently set for the sweep.

Syntax SOUR(0..26):SWE:TIME?

Response A value representing the duration currently set for the sweep in the "HHHH:MM:SS" format.

Example SOUR4:SWE:TIME?

SOURce:WAVelength:LENGth

Description This command selects a new source wavelength. The current spectral unit (nm or THz) applies.

Syntax SOUR(0..26):WAV:LENG<space><wave>

Parameters The <wave> parameter represents the new wavelength in the "9999.99" (nm) or "999.999" (THz) format. The value must be equal to or greater than the value returned by SOUR:WAV:LIM:LOW? and equal to or smaller than the value returned by SOUR:WAV:LIM:HIGH?

Note This function cannot be performed if the application is running in ASE, Sweep, or Program mode. If the value is out of range, the closest available value will be selected.

Example SOUR4:WAV:LENG 1310.00

See also SOUR:WAV:LENG?, SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:LOW?, SOUR:WAV:LIM:STEP?, UNIT:WAV, and UNIT:WAV?

SOURce:WAVelength:LENGth?

Description	This query returns the current source wavelength in the current spectral unit (nm or THz).
Syntax	SOUR(0..26):WAV:LENG?
Response	A value representing the current wavelength in the "9999.99" (nm) or "999.999" (THz) format.
Note	This function cannot be performed if the application is running in ASE mode.
Example	SOUR4:WAV:LENG?
See also	SOUR:WAV:LENG, SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:LOW?, SOUR:WAV:LIM:STEP?, UNIT:WAV, and UNIT:WAV?

SOURce:WAVelength:LIMit:HIGH?

Description This query returns the maximum wavelength that can be set with the SOUR:WAV:LENG command. The return value will be in the current spectral unit (nm or THz).

Syntax SOUR(0..26):WAV:LIM:HIGH?

Response A value representing the maximum available wavelength in the "9999.99" (nm) or "999.999" (THz) format.

Example SOUR4:WAV:LIM:HIGH?

See also SOUR:WAV:LENG, SOUR:WAV:LENG?, SOUR:WAV:LIM:LOW?, SOUR:WAV:LIM:STEP?, UNIT:WAV, and UNIT:WAV?

SOURce:WAVelength:LIMit:LOW?

Description This query returns the minimum wavelength that can be set with the SOUR:WAV:LENG command. The return value will be in the current spectral unit (nm or THz).

Syntax SOUR(0..26):WAV:LIM:LOW?

Response A value representing the maximum available wavelength in the "9999.99" (nm) or "999.999" (THz) format.

Example SOUR4:WAV:LIM:LOW?

See also SOUR:WAV:LENG, SOUR:WAV:LENG?, SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:STEP?, UNIT:WAV, and UNIT:WAV?

SOURce:WAVelength:LIMit:STEP?

Description This query returns the minimum wavelength step that can be used when changing the wavelength with the SOUR:WAV:LENG command. The return value will be in the current spectral unit (nm or THz).

Syntax SOUR(0..26):WAV:LIM:STEP?

Response A value representing the minimum wavelength step available in the "9999.99" (nm) or "999.999" (THz) format.

Example SOUR4:WAV:LIM:STEP?

See also SOUR:WAV:LENG, SOUR:WAV:LENG?, SOUR:WAV:LIM:HIGH?, SOUR:WAV:LIM:LOW?, UNIT:WAV, and UNIT:WAV?

UNITe:WAVelength

Description This command changes the spectral measurement unit (nm or THz). This command cannot be used in ASE, Program, or Sweep mode.

Syntax UNIT(0..26):WAV<space><unit>

Parameters The <unit> parameter is a boolean parameter representing the new spectral measurement unit:
"1" -use THz
"0" -use nm

Example UNIT4:WAV 1

UNITe:WAVelength?

Description This query returns the current spectral measurement unit.

Syntax UNIT(0..26):WAV?

Response A boolean value representing the current spectral measurement unit:
"1" -indicate THz
"0" -indicate nm

Example UNIT4:WAV?

IQ-3100/3300 Variable Attenuator/Reflector Commands

The IQ-3100 Variable Attenuator and IQ-3300 Variable Reflector are modules that share the same commands. The parameters in the following commands can be either attenuation values (IQ-3100) or reflection values (IQ-3300), depending on the module type.

IMPORTANT

For the purpose of these commands, both attenuation and reflection (return loss) are considered to be positive values.

INPut:ARESolution?

Description	This query returns the smallest attenuation or reflection step available. Use this command to determine the maximum resolution of the attenuation or reflection setting.
Syntax	INP(0..26):ARES?
Response	An attenuation or reflection value in the "-9.999" format. The unit is dB.
Example	INP4:ARES?

INPut:ATTenuation

Description This command sets the attenuation or reflection to a specific value. The valid range of values depends on the type of module, the configuration, and the current wavelength. See the appropriate module instruction manual. The resolution of the value is 0.005 dB for singlemode attenuators, and 0.01 dB for multimode attenuators and variable reflectors.

Syntax INP(0..26):ATT<space><value>[<space><units>]

Parameters The <value> parameter can be:

a valid attenuation or reflection value followed by the [DB] unit

or

"MIN" -set the module to the minimum setting for the current wavelength

"MAX" -set the module to the maximum setting for the current wavelength

Note that, depending on the current measurement mode, the <value> parameter takes different values.

In Absolute mode:

<value> = actual attenuation

In Reference mode:

<value> = actual attenuation - reference value (INP:OFFS?)

In Offset mode:

<value> = actual attenuation + wavelength-specific offset

Therefore, when in Reference or Offset mode, the range of the accepted values for the <value> parameter will change according to the current reference or offset value.

Example INP4:ATT -15.355 DB

INPut:ATTenuation?

Description This query returns a value indicating the current attenuation or reflection setting, or the minimum/maximum attenuation or reflection setting.

Syntax INP(0..26):ATT?[<space><value>]

Parameters The <value> parameter is optional and can be:

"MIN" -obtain the minimum setting for the current wavelength

"MAX" -obtain the maximum setting for the current wavelength

Response The attenuation or reflection value in the "±999.999" format. The unit is dB.

Example INP4:ATT? MIN

or

INP4:ATT?

INPut:OFFSet

Description This command sets a reference value. When the module is set to Relative mode, the displayed attenuation or reflection is relative to this reference value. This command will have no effect when in Absolute mode.

Syntax INP(0..26):OFFS<space><value>[<space><DB>]

Parameters The <value> parameter can be a valid attenuation or reflection value followed by the (optional) [DB] unit. The value must be between -0.800 and -99.995.

Example INP4:OFFS -12.345 DB

INPut:OFFSet?

Description This query returns the current reference value.

Syntax INP(0..26):OFFS?

Response The current reference in the "±999.999" format. The unit is dB.

Example INP4:OFFS?

INPut:OFFSet:DISPlay

Description This command sets the reference value to the current absolute attenuation or reflection setting. The displayed attenuation or reflection will be relative to the reference.

Syntax INP(0..26):OFFS:DISP

Example INP4:OFFS:DISP

INPut:WAVelength

Description This command selects a specific calibrated wavelength. The wavelength range depends on the type and configuration of the module. See the appropriate module instruction manual for further information.

Syntax INP(0..26):WAV<space><numeric_value>[<space><NM>]

Parameters The <numeric_value> parameter is the current wavelength in the 9999.9[NM] format. The unit is optional.

Example INP4:WAV 1310 NM

INPut:WAVelength?

Description This query returns a value indicating the currently selected wavelength, the minimum available wavelength, or the maximum available wavelength.

Syntax INP(0..26):WAV?[<space><min_or_max>]

Parameters The <min_or_max> parameter is optional and can be:
"MIN" -request minimum wavelength
"MAX" -request maximum wavelength

Response The wavelength in the "9999.9" format. The unit is nm.

Example INP4:WAV? MAX
or
INP4:WAV?

OUTPut:APMode

Description This command selects absolute or relative attenuation or reflection display. When "absolute" is selected, the absolute attenuation or reflection introduced by the module is displayed. When relative display is selected, attenuation or reflection relative to the current reference is displayed.

Syntax OUTP(0..26):APM<space><boolean>

Parameters The <boolean> parameter can be:
"0" or "OFF" -Relative display mode
"1" or "ON" -Absolute display mode

Example OUTP4:APM ON

OUTPut:APMode?

Description This query returns a value indicating whether or not Absolute display mode is selected.

Syntax OUTP(0..26):APM?

Response "0" -Relative display mode is selected
"1" -Absolute display mode is selected

Example OUTP4:APM?

OUTPut[:STATe]

Description This command controls the shutter. With an attenuator, the shutter blocks optical continuity. For a variable reflector, the shutter removes the reflection generating mirror from the circuit and optical continuity is maintained.

Syntax OUTP(0..26)[:STAT]<space><boolean>

Parameters The <boolean> parameter can be:
"0" or "OFF" -close the shutter optically
"1" or "ON" -open the shutter optically

Example OUTP4:STAT ON

OUTPut[:STATe]?

Description This query returns the state of the instrument shutter.

Syntax OUTP(0..26):[STAT?]

Response "0" -the shutter is optically closed
"1" -the shutter is optically open

Example OUTP4:STAT?

PROGram:SELected:NAME

Description This command loads a previously defined attenuation or reflection program into the module's internal memory.

Syntax PROG(0..26):SEL:NAME<space><string>

Parameters The <string> parameter is the path and filename of the program to be loaded.

Example PROG4:SEL:NAME C:\IQ\USERFILE\PROGFVA.PRG

PROGram:SELected:NAME?

Description This query returns the name and path of the currently loaded attenuation or reflection program.

Syntax PROG(0..26):SEL:NAME?

Response Returns a string identifying the path and name of the program file in the "C:\IQ\USERFILE\PROGFVA.PRG" format.

Example PROG4:SEL:NAME?

PROGram:SELected:STATe

Description This command controls the state of the currently loaded program.

Syntax PROG(0..26):SEL:STAT<space><value>

Parameters The <value> parameter can be:

"0" or "RUN"	-start the program
"1" or "PAUSe"	-pause the program
"2" or "STOP"	-stop program execution
"3" or "CONTinue"	-resume a paused program

Example PROG4:SEL:STAT RUN

PROGram:SELected:STATe?

Description This query returns a value indicating the state of the loaded program.

Syntax PROG(0..26):SEL:STAT?

Response

"STOPPED"	-the program is stopped
"PAUSED"	-the program is paused
"RUNNING"	-the program is in progress

Example PROG4:SEL:STAT?

IQ-3200 Return Loss Meter Commands

ABORt

Description This command stops any measurement currently in process.

Syntax ABOR(0..26)

Example ABOR4

FETCh?

Description This query fetches the last ORL measurement stored into the stack.

Syntax FETC(0..26)?

Response The last ORL measurement stored into the stack (in dB) in the "-999.999" format.

Note To store measurements into the stack, use the INIT:CONT or INIT:IMM commands or the READ:POW? query.

Example FETC4?

See also INIT:CONT, INIT:CONT?, INIT:IMM, and READ:POW?

FORMat:READings:DATA

Description This command changes the resolution of the optical return loss (ORL) measurement.

Syntax FORM(0..26):READ:DATA<space><digits>

Parameters The <digits> parameters can be:
"0" -zero digit after the decimal point
"1" -one digit after the decimal point
"2" -two digits after the decimal point
"3" -three digits after the decimal point
"4" -automatic resolution (determined by the measured value)

Example FORM4:READ:DATA 3

FORMat:READings:DATA?

Description This query returns the current measurement resolution.

Syntax FORM(0..26):READ:DATA?

Response
"0" -zero digit after the decimal point
"1" -one digit after the decimal point
"2" -two digits after the decimal point
"3" -three digits after the decimal point
"4" -automatic resolution (determined by the measured value)

Example FORM4:READ:DATA?

INITiate:CONTinuous

Description This command starts or stops Continuous mode. While Continuous mode is activated, ORL measurements are continuously stored into a stack.

Syntax INIT(0..26):CONT<space><boolean>

Parameters The <boolean> value refers to:
"0" or "OFF" -stop measurements
"1" or "ON" -start measurements

Note To obtain the last measurement stored into the stack, use the FETC? query.

Example INIT4:CONT 1

See also FETC?, INIT:CONT?, INIT:IMM, and READ:POW?

INITiate:CONTinuous?

Description This query returns a value indicating whether Continuous mode is activated.

Syntax INIT(0..26):CONT?

Response A boolean value:
"0" -continuous measurements are not in progress
"1" -continuous measurements are in progress

Example INIT4:CONT?

See also FETC?, INIT:CONT, INIT:IMM, and READ:POW?

INITiate[:IMMediate]

Description This command stores the current measurement into a stack.

Syntax INIT(0..26)[:IMM]

Note To obtain the last measurement stored into the stack, use the FETC? query.

Example INIT4:IMM

See also FETC?, INIT:CONT, INIT:CONT?, and READ:POW?

INPut:OFFSet

Description This command selects an offset value that will be added to (or subtracted from) the ORL measurement.

Syntax INP(0..26):OFFS<space><numeric_value>[<space>DB]

Parameters The <numeric_value> parameter is the desired offset in the "±999.999" format. The [DB] unit is optional.

Example INP4:OFFS 6.2 DB

READ:POWer?

Description This query stores the current ORL measurement into a stack (as with the INIT:IMM command) and fetches it right away (as with the FETC? query).

Syntax READ(0..26):POW?

Response The last ORL measurement value stored into the stack (in dB) in the "±999.999" format.

Example READ4:POW?

See also FETC?, INIT:CONT, INIT:CONT?, and INIT:IMM

SENSitivity:AVERage:STATe

Description This command activates or deactivates data averaging.

Syntax SENS(0..26):AVER[:STAT]<space><boolean>

Parameters The <boolean> parameter can be:
"0" or "OFF" -deactivate data averaging
"1" or "ON" -activate data averaging

Example SENS4:AVER:STAT 1

SENSitivity:AVERage:STATe?

Description This query returns a value indicating whether data averaging is on or off.

Syntax SENS(0..26):AVER:STAT?

Response "0" -averaging is OFF
"1" -averaging is ON

Example SENS4:AVER:STAT?

SENSitivity:CORRection:COLLect:ZERO

Description This command performs an offset nulling measurement.

Syntax SENS(0..26):CORR:COLL:ZERO

Example SENS4:CORR:COLL:ZERO

SENSitivity:FREQuency

Description This command selects a data sampling rate.

Syntax SENS(0..26):FREQ<space><numeric_value>[<space>HZ]

Parameters The <numeric_value> parameter is the sampling rate in units of sec^{-1}: 0.1, 0.5, 1.0, or 5.0

Note If an invalid parameter is entered, the "Data type error" message appears.

Example SENS4:FREQ 0.5

SENSitivity:FREQuency?

Description This query returns the current sampling rate.

Syntax SENS(0..26):FREQ?

Response The current sampling rate in samples per second: 0.1, 0.5, 1.0, or 5.0.

Example SENS4:FREQ?

SENSitivity:FREQuency:CATalog?

Description This query returns the list of available sampling rates.

Syntax SENS(0..26):FREQ:CAT?

Response The list of available sampling rates in the "9.9" format.

Example SENS4:FREQ:CAT?

SENSitivity:POWer:RANGe[:LOWer]?

Description This query returns the minimum measurable reflection.

Syntax SENS(0..26):POW:RANG[:LOW]?

Response The minimum measurable reflection (in dB) in the "-999.9" format.

Example SENS4:POW:RANG:LOW?

SENSitivity:POWer:REFerence

Description This command performs the IQ-3200 reference calibration. The command format includes parameters that also set the calibration reference reflection value. When calibrating with the EXFO supplied reference reflection jumper, the module software automatically determines the correct calibration value based on the currently selected wavelength.

Syntax SENS(0..26):POW:REF <space><value>[<space><units>]

Parameters The <value> parameter can be:

"EXFO"	-use the supplied reference reflection. The numeric value will be provided by the module software
or	
"±99.999"	-a numeric value expressing the reference reflection.

When a numeric value is entered, the <units> parameter must be specified:

"DB"	-the reference reflection is expressed in dB (default).
"%"	-the reference reflection is expressed in %.

Example SENS4:POW:REF EXFO

SENSitivity:POWer:REFLection-free

Description This command performs a zero measurement, eliminating the effects of parasitic reflections. A zero measurement can be performed for each wavelength (maximum 2).

Syntax SENS(0..26):POW:REFL

Example SENS4:POW:REFL

SENSitivity:POWer:WAVelength?

Description This command returns the currently selected wavelength.

Syntax SENS(0..26):POW:WAV?

Response The current wavelength in nanometers (nm) in the "9999" format.

Example SENS4:POW:WAV?

See also SENS:POW:WAV?, SENS:POW:WAV:LIST?, SENS:POW:WAV:PROG, and SENS:POW:WAV:SET

SENSitivity:POWer:WAVelength:LIST?

Description This query returns the list of programmed wavelengths. The maximum number of values in the list is 2. Note that executing this command does not activate the wavelength.

Syntax SENS(0..26):POW:WAV:LIST?

Response There are two wavelengths in the "9999 - 9999" format: the first value is wavelength 1 and the second value is wavelength 2.

Example SENS4:POW:WAV:LIST?

SENSitivity:POWer:WAVelength:PROGram

Description This command programs the two available wavelengths. Any two wavelengths between 1250 nm and 1600 nm at 1 nm resolution can be selected (the 1250—1600-nm range may vary depending on the module).

Syntax SENS(0..26):POW:WAV:PROG<space><sel_lam>,<value>[<space>NM]

Parameters The <sel_lam> parameter identifies which of the programmed wavelengths will be modified. Acceptable values are 1 or 2.
The <value> parameter is a calibrated wavelength. Any wavelength within the spectral range of the IQ-3200 (1250-1650 nm) at 1 nm resolution can be used. The [NM] unit is optional.

Example SENS4:POW:WAV:PROG 1,1310 NM
This command sets wavelength number 1 to 1310 nm.

SENSitivity:POWer:WAVelength:SET

Description This command selects a new wavelength. The wavelength must be one of the two programmed values.

Syntax SENS(0..26):POW:WAV:SET<space><numeric_value>[<space>NM]

Parameters The <numeric_value> parameter is a calibrated wavelength and must be one of the two programmed values. The [NM] unit is optional.

Example SENS4:POW:WAV:SET 1310 NM

IQ-3400 PDL/OL Meter Commands

ABORt

Description This command stops any measurement currently in process.

Syntax ABOR(0..26)

Example ABOR4

DISPlay:CPL

Description This command is used to enable CPL testing mode.

Syntax DISP(0..26):CPL

Example DISP4:CPL

DISPlay:DUT

Description This command is used to enable the DUT testing mode.

Syntax DISP(0..26):DUT

Example DISP4:DUT

DISPlay:ORL

Description This command is used to enable the general ORL mode.

Syntax DISP(0..26):ORL

Example DISP4:ORL

FETCh[:SCALar]:POWer:DC?

Description This query returns the last ORL measurement stored into the stack. This query can only be performed in ORL mode.

Syntax FETC(0..26)[:SCAL]:POW:DC?

Response The last measurement stored into the stack in the "±999.999" format.

Note To store measurements into the stack, use the INIT:CONT or INIT:IMM commands or the READ:POW? query.

Example FETC4:SCAL:POW:DC?

See also INIT:CONT, INIT:CONT?, INIT:IMM, and READ:POW?

FORMat:READings:DATA

Description This command changes the resolution of the displayed ORL or PDL value (number of digits after the decimal point).

Syntax FORM(0..26):READ:DATA<space><resol>

Parameters The <resol> parameter represents the new resolution:
"0" -0 digit after the decimal point
"1" -1 digit after the decimal point
"2" -2 digits after the decimal point
"3" -3 digits after the decimal point
"4" -automatic resolution (determined by the measured value)

Example FORM4:READ:DATA 3

FORMat:READings:DATA?

Description This query returns the current resolution of the displayed value.

Syntax FORM(0..26):READ:DATA?

Response A value representing the new resolution:
"0" -0 digit after the decimal point
"1" -1 digit after the decimal point
"2" -2 digits after the decimal point
"3" -3 digits after the decimal point
"4" -automatic resolution (determined by the measured value)

Example FORM4:READ:DATA?

INITiate:CONTinuous

Description This command can be used only in PDL mode to start or stop a scan.

Syntax INIT(0..26):CONT<space><state>

Parameters The <state> parameter is a boolean parameter:
"1" -start action
"0" -stop action

Note To obtain the last measurement stored into the stack, use the FETC[:SCAL]:POW:DC? query.

Example INIT4:CONT 1

See also INIT:CONT?, INIT:IMM, FETC:SCAL:POW:DC?, and READ:POW?

INITiate:CONTinuous?

Description This query returns a value indicating whether Continuous mode is activated. This query can only be performed in ORL mode.

Syntax INIT(0..26):CONT?

Response A boolean value:
"1" -Continuous mode is activated
"0" -Continuous mode is deactivated

Example INIT4:CONT?

See also INIT:CONT, INIT:IMM, FETC:SCAL:POW:DC?, and READ:POW?

INITiate[:IMMediate]

Description This command stores the current measurement into a stack.

Syntax INIT(0..26)[:IMM]

Note To obtain the last measurement stored into the stack, use the FETC[:SCAL]:POW:DC? query.

Example INIT4:IMM

See also INIT:CONT, INIT:CONT?, FETC:SCAL:POW:DC?, and READ:POW?

INPut:OFFSet

Description This command sets an offset value that is applied to ORL measurements. This command can only be performed in ORL mode.

Syntax INP(0..26):OFFS<space><offset>

Parameters The <offset> parameter represents a new offset value (in dB) in the "±99.999" format.

Example INP4:OFFS 25.000

INPut:OFFSet?

Description This query returns the current offset value that is applied to ORL measurements. This query can only be performed in ORL mode.

Syntax INP(0..26):OFFS?

Response A value representing the current offset (in dB) in the "±99.999" format.

Example INP4:OFFS?

MMEMory:ACQuisition

Description This command starts or stops a PDL scan whether in the DUT or CPL testing mode (acquisition data are saved). This command can only be performed in PDL mode and when no scan (INIT:CONT) is in progress.

Syntax MMEM(0..26):ACQ<space><state>

Parameters The <state> parameter is a boolean parameter:
"1" -start an acquisition
"0" -stop an acquisition

Example MMEM4:ACQ 1

MMEMory:ACQuisition?

Description This query returns a value indicating whether an acquisition is in progress. This query can only be performed in PDL mode.

Syntax MMEM(0..26):ACQ?

Response A boolean value:
"1" -acquisition is in progress
"0" -acquisition is not in progress

Example MMEM4:ACQ?

READ:POWer?

Description This query stores the current ORL measurement into the stack and fetches it right away. This query can only be performed in ORL mode.

Syntax READ(0..26):POW?

Response A value representing the current ORL measurement in the "±999.999" format.

Example READ4:POW?

See also INIT:CONT, INIT:CONT?, INIT:IMM, and FETC:SCAL:POW:DC?

SENSitivity:AVERage:STATe

Description This command activates or deactivates data averaging. This command can only be performed in ORL mode.

Syntax SENS(0..26):AVER:STAT<space><average>

Parameters The <average> parameter is a boolean parameter:
"1" -enable data averaging
"0" -disable data averaging

Example SENS4:AVER:STAT 1

SENSitivity:AVERage:STATe?

Description This query returns a value indicating whether data averaging is enabled.

Syntax SENS(0..26):AVER:STAT?

Response A boolean value:
"1" -data averaging is enabled
"0" -data averaging is disabled

Example SENS4:AVER:STAT?

SENSitivity:CORRection:COLLect:ZERO

Description This command performs an offset nulling measurement. This command cannot be performed if a scan is in progress.

Syntax SENS(0..26):CORR:COLL:ZERO

Example SENS4:CORR:COLL:ZERO

SENSitivity:POWer:CALibrate

Description This command is used to perform a PDL calibration in the DUT or CPL testing mode. This command can only be performed in PDL mode and when a scan is not in progress.

Syntax SENS(0..26):POW:CAL<space><calib>

Parameters The <calib> parameter is a boolean parameter:
"0" -perform a PDL calibration in DUT testing mode
"1" -perform a PDL calibration in CPL testing mode

Example SENS4:POW:CAL 1

SENSitivity:POWer:COUNt

Description This command is used to set the total number of scans to be performed. This command can only be performed in PDL mode and when a scan is not in progress.

Syntax SENS(0..26):POW:COUN<space><scans>

Parameters The <scans> parameter represents the new number of scans in the "9999" format. The value must be between 2 and 9999.

Example SENS4:POW:COUN 1500

SENSitivity:POWer:COUNt?

Description This query returns the number of scans to be performed. This query can only be performed in PDL mode.

Syntax SENS(0..26):POW:COUN?

Response A value representing the number of scans to be performed in the "9999" format.

Example SENS4:POW:COUN?

SENSitivity:POWer:PERiod

Description This command is used to set the period. This command can only be performed in PDL mode and when a scan is not in progress.

Syntax SENS(0..26):POW:PER<space><period>

Parameters The period parameter represents the new period (in seconds) in the "9999" format:
"2" to "9999"-resolution is 0.01 dB
"5" to "9999"-resolution is 0.001 dB

Example SENS4:POW:PER 1675

SENSitivity:POWer:PERiod?

Description This query returns the current period in seconds. This query can only be performed in PDL mode.

Syntax SENS(0..26):POW:PER?

Response A value representing the current period (in seconds) in the "9999" format, between 2 and 9999 (0.01 dB resolution) or between 5 and 9999 (0.001 dB resolution).

Example SENS4:POW:PER?

SENSitivity:POWer:RANGe[:LOWer]?

Description This query returns the minimum measurable reflection. This query can only be performed in ORL mode.

Syntax SENS(0..26):POW:RANG[:LOW]?

Response The minimum measurable reflection (in dB) in the "-999.9" format.

Example SENS4:POW:RANG:LOW?

SENSitivity:POWer:REFerence

Description This command is used to perform the IQ-3400 reference calibration. When using the EXFO supplied reference reflection test jumper, the software automatically determines the appropriate calibration value based on the current wavelength. This command can only be performed in ORL mode.

Syntax SENS(0..26):POW:REF<space><numeric>,<Exfo>,<unit>

Parameters The <numeric> parameter represents the reference in ORL mode (in dB) in the "±99.999" format. Acceptable values are between -50.000 and 100.000 dB.

The <Exfo> parameter is a boolean parameter indicating the type of reference to be used:

"1" -use an EXFO reference

"2" -use another reference than EXFO's

The <unit> parameter represents the measurement unit:

"2" -use dB unit

"3" -use % unit

Example SENS4:POW:REF 25.000,1,3

SENSitivity:POWer:REFLection

Description This command performs a zero measurement for the current wavelength. A zero measurement eliminates the effects of parasitic reflections and must be performed for each wavelength (maximum of 2). This command can only be performed in ORL mode.

Syntax SENS(0..26):POW:REFL

Example SENS4:POW:REFL

SENSitivity:POWer:WAVelength

Description This command selects a new operating wavelength in PDL mode.

Syntax SENS(0..26):POW:WAV<space><wave>

Parameters The <wave> parameter represents the new operating wavelength in PDL mode.

Example SENS4:POW:WAV 1310

See also SENS:POW:WAV?, SENS:POW:WAV:LIST, SENS:POW:WAV:PROG, and SENS:POW:WAV:SET

SENSitivity:POWer:WAVelength?

Description This query returns the wavelength currently selected in the current mode (PDL or ORL).

Syntax SENS(0..26):POW:WAV?

Response A value representing the currently selected wavelength (in nm) in the "9999" format. The value is between 1200 and 1625.

Example SENS4:POW:WAV?

See also SENS:POW:WAV, SENS:POW:WAV:LIST, SENS:POW:WAV:PROG, and SENS:POW:WAV:SET

SENSitivity:POWer:WAVelength:LIST?

Description This query returns the two programmed wavelengths. This query can only be performed in ORL mode.

Syntax SENS(0..26):POW:WAV:LIST?

Response The two programmed wavelengths (in nm) in the "9999;9999" format, each between 780 and 1800.

Example SENS4:POW:WAV:LIST?

See also SENS:POW:WAV, SENS:POW:WAV?, SENS:POW:WAV:PROG, and SENS:POW:WAV:SET

SENSitivity:POWer:WAVelength:PROGram

Description This command is used to program two wavelengths. This command can only be performed in ORL mode.

Syntax SENS(0..26):POW:WAV:PROG<space><case>,<wave>

Parameters The <case> parameter specifies the wavelength to be programmed:
"1" -program the first wavelength
"2" -program the second wavelength
The <wave> parameter represents the new wavelength (in nm) in the "9999" format. The value must be between 1200 and 1625.

Example SENS4:POW:WAV:PROG 2,1310

See also SENS:POW:WAV, SENS:POW:WAV?, SENS:POW:WAV:LIST, and SENS:POW:WAV:SET

SENSitivity:POWer:WAVelength:SET

Description This command selects a new operating wavelength in ORL mode. The wavelength must be one of the two programmed values for the ORL mode.

Syntax SENS(0..26):POW:WAV:SET<space><wave>

Parameters The <wave> parameter represents the new operating wavelength in ORL mode.

Example SENS4:POW:WAV:SET 1310

See also SENS:POW:WAV, SENS:POW:WAV?, SENS:POW:WAV:LIST, and SENS:POW:WAV:PROG

UNIT:POWer

Description This command changes the power measurement unit. This command can only be performed in PDL mode.

Syntax UNIT(0..26):POW<space><unit>

Parameters The <unit> parameter represents the new power measurement unit:
"0" -set dB
"1" -set %

Example UNIT4:POW 1

UNIT:POWer?

Description This query returns the current power measurement unit. This query can only be performed in PDL mode.

Syntax UNIT(0..26):POW?

Response A value representing the current power measurement unit:
"0" -indicate dB
"1" -indicate %

Example UNIT4:POW?

IQ-5100 Polarization Controller Commands

INITiate:SCAN

Description This command is used to start or stop random scanning.

Syntax INIT(0..26):SCAN<space><state>

Parameters The <state> parameter is a boolean parameter:
"1" -start random scanning
"0" -stop random scanning

Example INIT4:SCAN 1

INITiate:SCAN?

Description This query returns a value indicating whether random scanning is in progress.

Syntax INIT(0..26):SCAN?

Response A boolean value:
"1" -random scanning in progress
"0" -random scanning not in progress

Example INIT4:SCAN?

INPut:CELL:VOLTage

Description This command is used to set the voltage for each waveplate. This command cannot be performed while a scan is in progress.

Syntax INP(0..26):CELL:VOLT<space><plate>,<voltage>[<space>V]

Parameters The <plate> parameter identifies the waveplate whose voltage will be set:
"1" -first waveplate
"2" -second waveplate
"3" -third waveplate
"4" -fourth waveplate
The <voltage> parameter represents the voltage to be set to the specified waveplate in the "99.999" format. The voltage must be between 2.000 and 12.000 volts.
The <V> parameter is optional and indicates volt units.

Example INP4:CELL:VOLT 1,4.521 V

INPut:CELL:VOLTage?

Description This query returns the voltage currently set for each waveplate. This query cannot be performed while a scan is in progress.

Syntax INP(0..26):CELL:VOLT?

Response The voltage currently set for each waveplate (from the first to the fourth) in the "99.999 99.999 99.999 99.999" format. The voltage is in volts.

Example INP4:CELL:VOLT?

INSTrument:PERiod

Description This command is used to select a scan period. This command cannot be performed while a scan is in progress.

Syntax INST(0..26):PER<space><period>[<space>SEC]

Parameters The <period> parameter represents the new scan period in seconds: 2.5, 5.0, or 10.0. The <SEC> parameter is optional and indicates units of seconds.

Example INST4:PER 5.0 SEC

INSTrument:PERiod?

Description This query returns the currently set scan period.

Syntax INST(0..26):PER?

Response The currently set scan period in seconds: 2.5, 5.0, or 10.0.

Example INST4:PER?

INSTrument:WAVelength

Description This command is used to select a wavelength. This command cannot be performed while a scan is in progress.

Syntax INST(0..26):WAV<space><wave>[<space>NM]

Parameters The <wave> parameter represents the new operating wavelength in nm in the "9999" format. The value must be between 1200 and 1625. The "NM" is optional and indicates nanometer units.

Example INST4:WAV 1310 NM

INSTrument:WAVelength?

Description This query returns the currently set wavelength in nanometers.

Syntax INST(0..26):WAV?

Response The currently set wavelength (in nm) in the "9999" format.

Example INST4:WAV?

IQ-5200 Optical Spectrum Analyzer Commands

ABORt

Description This command stops an acquisition in progress.

Syntax ABOR(0..26)

Example ABOR4

See also INIT:AUTO, INIT:CONT, INIT:MODE, INIT:MODE?, INIT:REAL, INIT:SCAN, and INIT:SING

CALCulate:ADB

Description This command applies the "R = A/B" mathematical operation to the selected traces. The power unit must be mW.

Syntax CALC(0..26):ADB

Example CALC4:ADB

CALCulate:AMB

Description This command applies the "R = A - B" mathematical operation to the selected traces. The power unit must be dBm.

Syntax CALC(0..26):AMB

Example CALC4:AMB

CALCulate:AMC

Description This command applies the "R = A × C" mathematical operation to the selected trace. The power unit must be mW.

Syntax CALC(0..26):AMC

Example CALC4:AMC

CALCulate:APC

Description This command applies the "R = A + C" mathematical operation to the selected trace. The power unit must be dBm.

Syntax CALC(0..26):APC

Example CALC4:APC

CALCulate:CHANnel:BANDwidth?

Description This query returns the bandwidth of the specified channel, in nm or THz (depending on the current frequency unit).

Syntax CALC(0..26):CHAN:BAND?<space><channel>

Parameters The <channel> parameter is the number of the channel whose bandwidth will be returned, between 1 and 320.

Response The bandwidth of the specified channel (in nm or THz) in the "9999.999" format.

Example CALC4:CHAN:BAND? 23

See also CALC:CHAN:COUN?

CALCulate:CHANnel:CENTer?

Description This query returns the central wavelength or frequency for the specified channel (in nm or THz, depending on the current spectral unit).

Syntax CALC(0..26):CHAN:CENT?<space><channel>

Parameters The <channel> parameter is the number of the channel whose center frequency will be returned. Valid channels are from 1 to 320.

Response The bandwidth of the specified channel (in nm or THz) in the "9999.999" format.

Example CALC4:CHAN:CENT? 23

CALCulate:CHANnel:CLIMits

Description This command adds or modifies a channel in the channel list, based on central wavelength or frequency and bandwidth.

Syntax CALC(0..26):CHAN:CLIM<space> , <bandwidth>[,<number>]

Parameters The parameter is the central wavelength or frequency of the channel (in nm or THz, depending on the current spectral unit) in the "9999.999" format.

The <bandwidth> parameter corresponds to the channel bandwidth (in nm or THz, depending on the current spectral unit) in the "9999.999" format.

The <number> parameter is optional and indicates which channel is to be modified. If no value is entered (default value = 0), a channel will be added to the channel list.

Note The channel list may include up to 320 channels.

Example CALC4:CHAN:CLIM 1670.25,2

See also CALC:CHAN:COUN? and CALC:CHAN:LRLI

CALCulate:CHANnel:COUNt?

Description This query returns the number of channels in the current channel list.

Syntax CALC(0..26):CHAN:COUN?

Response The number of channels in the current channel list in the "999" format, between 0 and 32.

Example CALC4:CHAN:COUN?

See also CALC:CHAN:BAND?

CALCulate:CHANnel:DELete

Description This command erases a channel from the current channel list.

Syntax CALC(0..26):CHAN:DEL<space><channel>

Parameters The <channel> parameter is the number of the channel to be erased. This parameter can be any integer from 1 to 320, or the word "ALL" to erase all channels at once from the current channel list.

Example CALC4:CHAN:DEL 23

CALCulate:CHANnel:LEFT?

Description This query returns the lower limit for the specified channel (in nm or THz, depending on the current spectral unit).

Syntax CALC(0..26):CHAN:LEFT?<space><channel>

Parameters The <channel> parameter is the number of the channel whose lower limit will be returned.

Response The lower limit for the specified channel (in nm or THz, depending on the current spectral unit) in the "9999.999" format.

Example CALC4:CHAN:LEFT? 23

CALCulate:CHANnel:LRLimits

Description This command adds or modifies a channel in the channel list, based on lower and upper limits.

Syntax CALC(0..26):CHAN:LRLI<space><lowlimit>,<uplimit>[,<channel>]

Parameters The <lowlimit> and <uplimit> parameters correspond to the lower and upper channel limits (in nm or THz, depending on the current spectral unit) in the "9999.999" format.
The <channel> parameter is optional and indicates which channel is to be modified. If no value is entered (default value = 0) a channel will be added to the channel list.

Note The channel list may include up to 320 channels.

Example CALC4:CHAN:CLIM 1560.57,1562.35,23

See also CALC:CHAN:CLIM and CALC:CHAN:COUN?

CALCulate:CHANnel:RIGHt?

Description This query returns the upper limit for the specified channel (in nm or THz, depending on the current spectral unit).

Syntax CALC(0..26):CHAN:RIGH?<space><channel>

Parameters The <channel> parameter is the number of the channel whose upper limit will be returned.

Response The upper limit for the specified channel (in nm or THz, depending on the current spectral unit) in the "9999.999" format.

Example CALC4:CHAN:RIGH? 23

CALCulate:CNS

Description This command specifies whether the trace must be recalculated upon acquisition of a new scan.

Syntax CALC(0..26):CNS<space><boolean>

Parameters The <boolean> parameter specifies whether the trace must be recalculated upon acquisition of a new scan. This parameter can be:
"YES" or "1" -activate recalculation
"NO" or "0" -deactivate recalculation

Example CALC4:CNS NO

CALCulate:CNS?

Description This query returns a value indicating whether the trace is recalculated upon acquisition of a new scan.

Syntax CALC(0..26):CNS?

Response
"YES" -the trace is recalculated upon acquisition of a new scan.
"NO" -the trace is not recalculated upon acquisition of a new scan.

Example CALC4:CNS?

CALCulate:DFB

Description This command applies the DFB analysis to trace A.

Syntax CALC(0..26):DFB[<space><bandwidth>]

Parameters The <bandwidth> parameter is optional and has the "99.99" format. The default value is 20.0.

Example CALC4:DFB 10

CALCulate:DFB?

Description This query returns the results of the last DFB analysis. The DFB analysis includes: the main mode wavelength, the peak power, the threshold status, the bandwidth, and the relative power used to compute the bandwidth.

Syntax CALC(0..26):DFB?

Response The results of the last DFB analysis in the "v, w, x, y, z" format, where
"v" is the main mode wavelength (in nm) in the "9999.999" format,
"w" is the peak power (in dBm) in the "±99.99" format,
"x" is the threshold status (ABOVE, BELOW or NO THRESHOLD),
"y" is the relative power used to compute the bandwidth (in dB) in the "99.99" format, and
"z" is the bandwidth (in nm) in the "99.99" format.

Example CALC4:DFB?

CALCulate:EDFA

Description This command applies the EDFA analysis to trace A, taking into account the current channel list and a reference trace.

Syntax CALC(0..26):EDFA

Example CALC:EDFA

See also CALC:EDFA? and CALC:EDFA:COUN?

CALCulate:EDFA?

Description This query returns the results of the last EDFA analysis (for a single peak point).

Syntax CALC(0..26):EDFA?<space><channel>

Parameters The <channel> parameter is the channel number (from 1 to 320).

Note The <channel> parameter is the ordinal list number of the channel, not the channel ID number.

Response The results of the last EDFA analysis (for a single peak point): channel number ("999"); peak wavelength ("9999.999"); peak power ("±99.99"); signal-to-noise ratio to the left ("99.99"); signal-to-noise ratio to the right ("99.99"); average signal-to-noise ratio ("99.99"); S% ("99.99"); gain ("99.99"); noise figure ("99.99").

Example CALC4:EDFA? 23

See also CALC:EDFA and CALC:EDFA:COUN?

CALCulate:EDFA:COUNt?

Description This query returns the number of results obtained in the last EDFA analysis.

Syntax CALC(0..26):EDFA:COUN?

Response The number of results obtained in the last EDFA analysis (a numeric value from 1 to 320).

Example CALC4:EDFA:COUN?

See also CALC:EDFA and CALC:EDFA?

CALCulate:PEAKlist

Description This command is used to analyze all the peak points along trace A.

Syntax CALC(0..26):PEAK

Example CALC4:PEAK

See also CALC:PEAK, CALC:PEAK?, and CALC:PEAK:COUN?

CALCulate:PEAKlist?

Description This query returns the latest information on a specific peak. Peaks are analyzed with the CALC:PEAK command.

Syntax CALC(0..26):PEAK?<space><channel>

Parameters The <channel> parameter specifies the peak whose information will be returned (from 1 to 320).

Response The latest information on the specified peak in the "y, z" format, where
"y" is the wavelength in the "999.99 nm" format, and
"z" is the peak status (whether or not the peak is saturated) in the "Saturated: TRUE" or "Saturated: FALSE" format.

Example CALC4:PEAK? 23

See also CALC:PEAK and CALC:PEAK:COUN?

CALCulate:PEAKlist:COUNt?

Description This query returns the number of peaks that were detected along trace A during the last peak analysis.

Syntax CALC(0..26):PEAK:COUN?

Response The number of peaks that were detected along trace A during the last peak analysis (from 1 to 320).

Example CALC4:PEAK:COUN?

See also CALC:PEAK and CALC:PEAK?

CALCulate:WDM

Description This command applies the WDM analysis to trace A, taking into account the current channel list and the selected bandwidth.

Syntax CALC(0..26):WDM[<space><bandwidth>]

Parameters The <bandwidth> parameter is optional: it is the relative power used to compute the bandwidth (in dB) in the "99.99" format. The default value is 20.0.

Example CALC4:WDM 5

See also CALC:WDM? and CALC:WDM:COUN?

CALCulate:WDM?

Description This query returns the latest WDM results for a specific channel.

Syntax CALC(0..26):WDM?<space><channel>

Parameters The <channel> parameter specifies the channel whose WDM results will be returned (from 1 to 320).

Note The <channel> parameter is the ordinal list number of the channel, not the channel ID number.

Response The latest WDM results for the specified channel: channel ID number ("999"); peak wavelength ("9999.999"); peak power ("±99.99"); signal-to-noise ratio to the left ("99.99"); signal-to-noise ratio to the right ("99.99"); average signal-to-noise ratio ("99.99"); bandwith at –3 dB ("99.99"); bandwidth at –20dB ("99.99").

Example CALC4:WDM? 23

See also CALC:WDM and CALC:WDM:COUN?

CALCulate:WDM:COUNt?

Description This query returns the number of results obtained during the last WDM analysis.

Syntax CALC(0..26):WDM:COUN?

Response A numeric value from 1 to 320.

Example CALC4:WDM:COUN?

See also CALC:WDM and CALC:WDM?

INFormation:DUT:COMMents

Description This command is used to add or edit information on the DUT.

Syntax INF(0..26):DUT:COMM<space><string>

Parameters The <string> parameter is the comment associated to the DUT. The comment can be up to 2000 characters long.

Example INF4:DUT:COMM Received on November 2

INFormation:DUT:COMMents?

Description This query returns the current DUT comment, as entered by the operator.

Syntax INF(0..26):DUT:COMM?

Response Comment about the DUT entered by the operator.

Example INF4:DUT:COMM?

INFormation:DUT:HUMidity

Description This command modifies the DUT humidity value.

Syntax INF(0..26):DUT:HUM<space><humidity>

Parameters The <humidity> parameter is the new DUT humidity (in %) in the "999.9" format.

Example INF4:DUT:HUM 16.7

INFormation:DUT:HUMidity?

Description This query returns the current DUT humidity value.

Syntax INF(0..26):DUT:HUM?

Response The DUT humidity value (in %) in the "999.9" format.

Example INF4:DUT:HUM?

INFormation:DUT:ID

Description This command modifies the DUT identification information.

Syntax INF(0..26):DUT:ID<space><string>

Parameters The <string> parameter is the DUT identification information and can be up to 19 characters long.

Example INF4:DUT:ID HFG7645

INFormation:DUT:ID?

Description This query returns the current DUT identification information.

Syntax INF(0..26):DUT:ID?

Response The current DUT identification information, which is a string up to 19 characters long.

Example INF4:DUT:ID?

INFormation:DUT:NAME

Description This command modifies the DUT name.

Syntax INF(0..26):DUT:NAME<space><string>

Parameters The <string> parameter is the DUT name and can be up to 29 characters long.

Example INF4:DUT:NAME Spider3

INFormation:DUT:NAME?

Description This query returns the current DUT name.

Syntax INF(0..26):DUT:NAME?

Response The current DUT name, which is a string up to 29 characters long.

Example INF4:DUT:NAME?

INFormation:DUT:SN

Description This command modifies the DUT serial number.

Syntax INF(0..26):DUT:SN<space><string>

Parameters The <string> parameter is the DUT serial number and can be up to 19 characters long.

Example INF4:DUT:SN XYZ0001234

INFormation:DUT:SN?

Description This query returns the current DUT serial number.

Syntax INF(0..26):DUT:SN?

Response The current DUT serial number, which is a string up to 19 characters long.

Example INF4:DUT:SN?

INFormation:DUT:TEMPerature

Description This command modifies the DUT temperature value.

Syntax INF(0..26):DUT:TEMP<space><temperature>

Parameters The <temperature> parameter is the DUT temperature value (in °C) in the "±99999.99" format. Valid values are from -273.00 to +10 000.00.

Example INF4:DUT:TEMP 23

INFormation:DUT:TEMPerature?

Description This query returns the current DUT temperature value.

Syntax INF(0..26):DUT:TEMP?

Response The DUT temperature value (in °C) in the "±99999.99" format. Responses may range from -273.00 to +10 000.00.

Example INF4:DUT:TEMP?

INFormation:GENeral:ADDRess

Description This command modifies the address of the organization of the IQ-5200 OSA operator.

Syntax INF(0..26):GEN:ADDR<space><string>

Parameters The <string> parameter is the address of the organization and can be up to 79 characters long.

Example INF4:GEN:ADDR 1 Industrial Avenue, Thiscity CA 08361

INFormation:GENeral:ADDRess?

Description This query returns the current organization address.

Syntax INF(0..26):GEN:ADDR?

Response The address of the organization, which is a string up to 79 characters long.

Example INF4:GEN:ADDR?

INFormation:GENeral:DIVision

Description This command modifies the name of the division of the IQ-5200 OSA operator.

Syntax INF(0..26):GEN:DIV<space><string>

Parameters The <string> parameter is the name of the division and can be up to 29 characters long.

Example INF4:GEN:DIV Quality Control

INFormation:GENeral:DIVision?

Description This query returns the current division name.

Syntax INF(0..26):GEN:DIV?

Response The current division name, which is a string up to 29 characters long.

Example INF4:GEN:DIV?

INFormation:GENeral:ORGanization

Description This command modifies the name of the organization of the IQ-5200 OSA operator.

Syntax INF(0..26):GEN:ORG<space><string>

Parameters The <string> parameter is the name of the organization and can be up to 24 characters long.

Example INF4:GEN:ORG FiberEXperts, Inc.

INFormation:GENeral:ORGanization?

Description This query returns the current organization name.

Syntax INF(0..26):GEN:ORG?

Response The current organization name, which is a string up to 24 characters long.

Example INF4:GEN:ORG?

INFormation:GENeral:TITLe

Description	This command modifies the title of the IQ-5200 OSA operator.
Syntax	INF(0..26):GEN:TITL<space><string>
Parameters	The <string> parameter is the title of the operator and can be up to 27 characters long.
Example	INF4:GEN:TITL OSA Expert

INFormation:GENeral:TITLe?

Description	This query returns the current operator's title.
Syntax	INF(0..26):GEN:TITL?
Response	The current operator's title, which is a string up to 27 characters long.
Example	INF4:GEN:TITL?

INFormation:GENeral:USER

Description	This command modifies the name of the IQ-5200 OSA operator.
Syntax	INF(0..26):GEN:USER<space><string>
Parameters	The <string> parameter is the name of the operator and can be up to 24 characters long.
Example	INF4:GEN:USER John Smith

INFormation:GENeral:USER?

Description This query returns the current operator's name.

Syntax INF(0..26):GEN:USER?

Response The current operator's name, which is a string up to 24 characters long.

Example INF4:GEN:USER?

INFormation:TRACe?

Description This query returns information about the active trace.

Syntax INF(0..26):TRACE?

Response The following information:
-date/time of acquisition. The format depends on the Windows settings;
-index of the range used for the acquisition (from 0 to 9);
-sweep mode: 15-character string maximum (Single, Real Time, AutoStop, or Continuous);
-current test: 15-character string maximum (WDM, EDFA, DFB, or Peak List);
-power offset (in dB) in the "±99.99" format;
-wavelength offset (in nm) in the "9999.999" format;
-power threshold (in dBm) in the "+99.99" format;
-signal-to-noise ratio threshold (in dB) in the "99.99" format;
-module model/serial number: 70-character string maximum;
-software version: "9.9C" format.

Example INF4:TRACE?

INITiate:AUTOstop

Description This command starts an acquisition in Auto-Stop mode. This command changes the current acquisition mode.

Syntax INIT(0..26):AUTO

Note You should set the number of scans (with the SENS:AVER:COUN command) before using the INIT:AUTO command.

Example INIT4:AUTO

See also ABOR, INIT:CONT, INIT:MODE, INIT:MODE?, INIT:REAL, INIT:SCAN, and INIT:SING

INITiate:CONTinuous

Description This command starts an acquisition in Continuous mode. This command changes the current acquisition mode.

Syntax INIT(0..26):CONT

Note You should set the number of scans (with the SENS:AVER:COUN command) before using the INIT:CONT command.

Example INIT4:CONT

See also ABOR, INIT:AUTO, INIT:MODE, INIT:MODE?, INIT:REAL, INIT:SCAN, and INIT:SING

INITiate:MODE

Description This command selects the current acquisition mode (Single, Continuous, Auto-Stop, or Real-Time).

Syntax INIT(0..26):MODE<space><mode>

Parameters The <mode> parameter is the new acquisition mode:
"SNGLS" -switch to single-scan mode
"CONTS" -switch to continuous-scan mode
"AUTOS" -switch to acquisition with a fixed number of scans
"REALT" -switch to real-time mode

Example INIT4:MODE CONTS

See also ABOR, INIT:AUTO, INIT:CONT, INIT:MODE?, INIT:REAL, INIT:SCAN, and INIT:SING

INITiate:MODE?

Description This query returns the current acquisition mode (Single, Continuous, Auto-Stop, or Real-Time).

Syntax INIT(0..26):MODE?

Response A character chain indicating the mode of acquisition:
"SNGLS" -single-scan mode
"CONTS" -continuous-scan mode
"AUTOS" -acquisition with a fixed number of scans
"REALT" -real-time mode

Example INIT4:MODE?

See also ABOR, INIT:AUTO, INIT:CONT, INIT:MODE, INIT:REAL, INIT:SCAN, and INIT:SING

INITiate:REALtime

Description This command starts an acquisition in Real-Time mode. This command changes the current acquisition mode.

Syntax INIT(0..26):REAL

Example INIT4:REAL

See also ABOR, INIT:AUTO, INIT:CONT, INIT:MODE, INIT:MODE?, INIT:SCAN, and INIT:SING

INITiate[:SCAN]

Description This command starts an acquisition in the current acquisition mode (Single, Continuous, Auto-Stop, or Real-Time). To select the current acquisition mode, use the INIT:MODE command.

Syntax INIT(0..26)[:SCAN]

Example INIT4:SCAN

See also ABOR, INIT:AUTO, INIT:CONT, INIT:MODE, INIT:MODE?, INIT:REAL, and INIT:SING

INITiate:SCAN?

Description This query returns a value indicating whether an acquisition is in progress.

Syntax INIT(0..26):SCAN?

Response "0" means the acquisition is not running
"1" means the acquisition is running

Example INIT4:SCAN?

See also ABOR, INIT:AUTO, INIT:CONT, INIT:MODE, INIT:REAL, INIT:SCAN, and INIT:SING

INITiate:SINGle

Description This command starts an acquisition in Single mode (only one scan is performed). This command changes the current acquisition mode.

Syntax INIT(0..26):SING

Example INIT4:SING

See also ABOR, INIT:AUTO, INIT:CONT, INIT:MODE, INIT:MODE?, INIT:REAL, and INIT:SCAN

INPut:OFFSet:ACTivate

Description This command activates and deactivates the power and wavelength offsets.

Syntax INP(0..26):OFFS:ACT<space><boolean>

Parameters The <boolean> parameter selects the state of the offsets:
"1" or "YES" -activate the offsets
"0" or "NO" -deactivate the offsets

Note This command activates both offsets at once. If there is one that you do not want to use, set it to zero.

Example INP4:OFFS:ACT 1

See also INP:OFFS:ACT?, INP:OFFS:POW, INP:OFFS:POW?, INP:OFFS:WAV, and INP:OFFS:WAV?

INPut:OFFSet:ACTivate?

Description This query returns the state of the offsets.

Syntax INP(0..26):OFFS:ACT?

Response A character chain where "YES" indicates that the offsets are active, and "NO" indicates that the offsets are inactive.

Example INP4:OFFS:ACT?

See also INP:OFFS:ACT, INP:OFFS:POW, and INP:OFFS:POW?

INPut:OFFSet:POWer

Description This command modifies the power offset.

Syntax INP(0..26):OFFS:POW<space><digit>

Parameters The <digit> parameter is the new power offset (in dB) in the "±99.99" format.

Example INP4:OFFS:POW –3.5

See also INP:OFFS:ACT, INP:OFFS:ACT?, and INP:OFFS:POW?

INPut:OFFSet:POWer?

Description This query returns the current power offset.

Syntax INP(0..26):OFFS:POW?

Response The current power offset (in dB) in the "±99.99" format.

Example INP4:OFFS:POW?

See also INP:OFFS:ACT, INP:OFFS:ACT?, and INP:OFFS:POW

INPut:OFFSet:WAVelength

Description	This command modifies the wavelength offset.
Syntax	INP(0..26):OFFS:WAV<space><offset>
Parameters	The <offset> parameter is the new wavelength offset (in nm) in the "±99.999" format.
Example	INP4:OFFS:WAV 14.235
See also	INP:OFFS:ACT, INP:OFFS:ACT?, and INP:OFFS:WAV?

INPut:OFFSet:WAVelength?

Description	This query returns the current wavelength offset.
Syntax	INP(0..26):OFFS:WAV?
Response	The current wavelength offset (in nm) in the "±99.999" format.
Example	INP4:OFFS:WAV?
See also	INP:OFFS:ACT, INP:OFFS:ACT?, and INP:OFFS:WAV

INPut:THReshold:ACTivate

Description This command activates and deactivates the thresholds (power and signal-to-noise ratio thresholds can be used).

Syntax INP(0..26):THR:ACT<space><boolean>

Parameters The <boolean> parameter selects the state of the thresholds:
"1" or "YES" -activate the thresholds
"0" or "NO" -deactivate the thresholds

Note This command activates both thresholds at once. If there is one that you do not want to use, set it to a value that can hardly be reached.

Example INP4:THR:ACT 1

See also CALC:DFB?, INP:THR:ACT?, INP:THR:POW, INP:THR:POW?, INP:THR:SN, and INP:THR:SN?

INPut:THReshold:ACTivate?

Description This query returns the state of the thresholds.

Syntax INP(0..26):THR:ACT?

Response A character chain where "YES" indicates that the thresholds are active, and "NO" indicates that the thresholds are inactive.

Example INP4:THR:ACT?

See also INP:THR:ACT, INP:THR:POW, INP:THR:POW?, INP:THR:SN, and INP:THR:SN?

INPut:THReshold:POWer

Description	This command modifies the power threshold.
Syntax	INP(0..26):THR:POW<space><power>
Parameters	The <power> parameter is a power value (in dBm) in the "±99.99" format.
Example	INP4:THR:POW 10
See also	INP:THR:ACT, INP:THR:ACT?, and INP:THR:POW?

INPut:THReshold:POWer?

Description	This query returns the current power threshold.
Syntax	INP(0..26):THR:POW?
Response	The current power threshold (in dBm) in the "±99.99" format.
Example	INP4:THR:POW?
See also	INP:THR:ACT, INP:THR:ACT?, and INP:THR:POW

INPut:THReshold:SN

Description	This command modifies the signal-to-noise ratio threshold.
Syntax	INP(0..26):THR:SN<space><power>
Parameters	The <power> parameter is a signal-to-noise ratio value (in dB) in the "99.99" format.
Example	INP4:THR:SN 0.25
See also	INP:THR:ACT, INP:THR:ACT?, and INP:THR:SN?

INPut:THReshold:SN?

Description This query returns the current signal-to-noise ratio threshold.

Syntax INP(0..26):THR:SN?

Response The current signal-to-noise ratio threshold (in dB) in the "99.99" format.

Example INP4:THR:SN?

See also INP:THR:ACT, INP:THR:ACT?, and INP:THR:SN

INSTrument:SWAP

Description This command swaps traces A and B.

Syntax INST(0..26):SWAP

Example INST4:SWAP

MMEM:LOAD:CHANnellist

Description This command recalls a channel list saved on file.

Syntax MMEM(0..26):LOAD:CHAN<space><file>

Parameters The <file> parameter is the full DOS name and path of the channel list to be loaded.

Example MMEM4:LOAD:CHAN C:\IQ\USERFILE\IQ5200\CHLIST01.CNL

See also MMEM:SAVE:CHAN

MMEM:LOAD:CONFig

Description	This command recalls a configuration saved on file.
Syntax	MMEM(0..26):LOAD:CONF<space><file>
Parameters	The <file> parameter is the full DOS name and path of the configuration to be loaded.
Example	MMEM4:LOAD:CONF C:\IQ\USERFILE\IQ5200\CONFIG01.CFG
See also	MMEM:SAVE:CONF

MMEM:LOAD:TRACe

Description	This command recalls a trace saved on file.
Syntax	MMEM(0..26):LOAD:TRAC<space><file>,<trace>
Parameters	The <file> parameter is the full DOS name and path of the trace to be loaded. The <trace> parameter is "A" or "B" and indicates whether the specified trace should be loaded as trace A or trace B.
Example	MMEM4:LOAD:TRAC C:\IQ\USERFILE\IQ5200\TRACE001.OSA
See also	MMEM:SAVE:TRAC

MMEM:SAVE:CHANnellist

Description This command saves the current channel list on file.

Syntax MMEM(0..26):SAVE:CHAN<space><file>

Parameters The <file> parameter is the full DOS name and path of the channel list to be saved.

Example MMEM4:SAVE:CHAN C:\IQ\USERFILE\IQ5200\CHLIST01.CNL

See also MMEM:LOAD:CHAN

MMEM:SAVE:CONFig

Description This command saves the current configuration on file.

Syntax MMEM(0..26):SAVE:CONF<space><file>

Parameters The <file> parameter is the full DOS name and path of the configuration to be saved.

Example MMEM4:SAVE:CONF C:\IQ\USERFILE\IQ5200\CONFIG01.CFG

See also MMEM:LOAD:CONF

MMEM:SAVE:TRACe

Description This command saves the current trace on file.

Syntax MMEM(0..26):SAVE:TRAC<space><file>,<trace>,<format>

Parameters The <file> parameter is the full DOS name and path of the trace to be saved.

The <trace> parameter specifies which of the active trace should be saved ("A" or "B").

The <format> parameter specifies in which format the trace should be saved ("OSA" or "TXT").

Note Only traces saved in OSA format can be opened again in the OSA application. Trace data saved in TXT format can be viewed and managed in spreadsheet and word processing programs.

Example MMEM4:SAVE:TRAC C:\IQ\USERFILE\IQ5200\TRACE001.OSA

See also MMEM:LOAD:TRAC

SENSitivity:AVERage:COUNt

Description This command changes the number of scans used to compute the final trace.

Syntax SENS(0..26):AVER:COUN<space><digit>

Parameters The <digit> parameter is the number of scans that must be taken into account to compute the final trace in the "99" format. The default value is 1.

Example SENS4:AVER:COUN 12

See also INIT:AUTO and INIT:CONT

SENSitivity:AVERage:COUNt?

Description This query returns the number of scans used to compute the final trace.

Syntax SENS(0..26):AVER:COUN?

Response The number of scans used to compute the final trace in the "99" format.

Example SENS4:AVER:COUN?

SENSitivity:POWer:RANGe

Description This command sets the IQ-5200 power sensitivity index.

Syntax SENS(0..26):POW:RANG<space><digit>

Parameters The <digit> parameter is the new power sensitivity index (from 0 to 9) in the "9" format.

Example SENS4:POW:RANG 2

SENSitivity:POWer:RANGe?

Description This query returns the value of the current power sensitivity.

Syntax SENS(0..26):POW:RANG?

Response The current power sensitivity index (from 0 to 9) in the "9" format.

Example SENS:POW:RANG?

TRACe:CLEar

Description This command closes one, some, or all active traces.

Syntax TRAC(0..26):CLE<space><trace>

Parameters The <trace> parameter identifies the trace(s) to be deleted:

"A" -trace A
"B" -trace B
"R" -resulting mathematical operation trace
"ALL" -all traces (trace A, B, and the resulting trace)

Note The selected traces are erased from the display. If trace A or B is erased, the resulting trace is automatically erased.

Example TRAC4:CLE ALL

TRACe:DATA?

Description This query returns the power values associated to each of the points on the trace.

Syntax TRAC(0..26):DATA?<space><trace>

Parameters The <trace> parameter identifies the trace whose power values will be returned:

"A" -trace A
"B" -trace B
"R" -resulting mathematical operation trace

Response A string of power values: one for every point on the trace. Power values are in the "±99.999" (mW) or "±99.99" (dBm) format. The response will be in mW or dBm, depending on the current power measurement unit.

Example TRAC4:DATA? B

See also TRAC:DATA:VALU?

TRACe:DATA:PREamble?

Description This query returns trace information: total number of points on the trace as well as first and last x-axis values.

Syntax TRAC(0..26):DATA:PRE?<space><trace>

Parameters The <trace> parameter identifies the trace whose information will be returned:
"A" -trace A
"B -trace B
"R" -resulting mathematical operation trace

Response Number of points composing the trace in the "99999" format. The first and last x-axis values. The format is "9999.999" (THz) or "9999.99" (nm). The response will be in THz or nm, depending on the current spectral unit.

Example TRAC4:DATA:PRE? R

See also TRAC:POIN

TRACe:DATA:VALue?

Description This query returns the power value associated to a specific x-axis point on the trace.

Syntax TRAC(0..26):DATA:VALU?<space><trace>,<distance>, <units>

Parameters The <trace> parameter identifies the trace:
"A" -trace A
"B" -trace B
"R" -resulting mathematical operation trace
The <distance> parameter has the "9999.999" format to indicate the wavelength or frequency for which the power value is searched.
The <units> parameter must be specified as "NM" or "THZ".

Response The power value associated to the specified point in the "±99.99" (dBm) or "±999.999" (mW) format. The response will be in dBm or mW, depending on the current power measurement unit.
If the specified point does not exist, the response is "1000".

Example TRAC4:DATA:VALU? B,1560,NM

See also TRAC:DATA?

TRACe:POINts?

Description This query returns the number of points that compose the specified trace.

Syntax TRAC(0..26):POIN?<space><trace>

Parameters The <trace> parameter identifies the trace:
"A" -trace A
"B" -trace B
"R" -resulting mathematical operation trace

Response The number of points that compose the specified trace in the "9999" format. If the specified trace does not exist, the response is "0".

Example TRAC4:POIN? A

See also TRAC:DATA:PRE?

UNIT:FREQuency

Description This command selects the spectral unit (nm or THz).

Syntax UNIT(0..26):FREQ<space><units>

Parameters The <units> parameter can be "NM" (default) for nanometers and "THZ" for terahertz.

Example UNIT4:FREQ THZ

UNIT:FREQuency?

Description This query returns the current spectral unit.

Syntax UNIT(0..26):FREQ?

Response The current spectral unit: "NM" means nanometers and "THZ" means terahertz.

Example UNIT4:FREQ?

UNIT:POWer

Description This command selects the power measurement unit (mW or dBm).

Syntax UNIT(0..26):POW<space><units>

Parameters The <units> parameter can be "DBM" (default) for dBm or "W" for milliwatts.

Example UNIT4:POW W

UNIT:POWer?

Description This query returns the current power measurement unit.

Syntax UNIT(0..26):POW?

Response The current power measurement unit: "DBM" means dBm and "W" means milliwatts.

Example UNIT4:POW?

IQ-5310 Wavelength Meter Commands

ABORt

Description This command stops the automatic storage of values.

Syntax ABOR(0..26)

Example ABOR4

FETCh[:SCALar]:POWer:DC?

Description This query returns the power value stored into the stack (in the current unit).

Syntax FETC(0..26)[:SCAL]:POW:DC?

Response The power value stored into the stack (in mW or dBm) in the "±999.999" format.

Example FETC4:SCAL:POW:DC?

See also INIT:CONT, INIT:CONT?, INIT:IMM, and READ:SCAL:POW:DC?

FETCh[:SCALar]:POWer:WAVelength?

Description This query returns the current spectral setting, in nanometers (nm) or terahertz (THz) depending on the current spectral unit.

Syntax FETC(0..26)[:SCAL]:POW:WAV?

Response The current spectral value. If the current spectral units are nanometers, the return value will be a wavelength in the "9999.999" format.

If the current spectral units are terahertz, the return value will be a frequency in the "99999.9999" format.

Example FETC4:SCAL:POW:WAV?

See also READ:SCAL:POW:WAV?, SENS:WAV:RANG?, SENS:WAV:UNIT, SENS:WAV:UNIT?, and UNIT:WAV

FORMat:READings[:DATA]

Description This command changes the accuracy level of the displayed values.

Syntax FORM(0..26):READ[:DATA]<space><level>

Parameters The level parameter represents the new accuracy level:
"0" -auto-resolution mode (resolution automatically adjusted depending on wavelength)
"1" -full-resolution mode (precision to 0.001 nm or to 0.0001 THz)

Example FORM4:READ:DATA 1

INITiate:CONTinuous

Description This command starts or stops Continuous mode. When Continuous mode is enabled, measurements are continuously stored into a stack. To fetch the last data stored to the stack, use the FETC:SCAL:POW:DC? query.

Syntax INIT(0..26):CONT<space><state>

Parameters The <state> parameter is a boolean value:
"1" -enable Continuous mode
"0" -disable Continuous mode

Example INIT4:CONT 1

See also FETC:SCAL:POW:DC?, INIT:CONT?, INIT:IMM, and READ:SCAL:POW:DC?

INITiate:CONTinuous?

Description This query returns a value indicating whether Continuous mode is enabled.

Syntax INIT(0..26):CONT?

Response A boolean value:
"1" -Continuous mode is enabled
"0" -Continuous mode is disabled

Example INIT4:CONT?

See also FETC:SCAL:POW:DC?, INIT:CONT, INIT:IMM, and READ:SCAL:POW:DC?

INITiate:IMMediate

Description This command stores the current measurement into the stack.

Syntax INIT(0..26):IMM

Example INIT4:IMM

See also FETC:SCAL:POW:DC?, INIT:CONT, INIT:CONT?, and READ:SCAL:POW:DC?

MMEMory:ACQuisition

Description This command starts or stops an acquisition on file.

Syntax MMEM(0..26):ACQ<space><state>

Parameters The <state> parameter is a boolean value:
"1" -start an acquisition on file
"0" -stop a running acquisition

Example MMEM4:ACQ 1

MMEMory:ACQuisition?

Description This query returns a value indicating whether an acquisition is in progress.

Syntax MMEM(0..26):ACQ?

Response A boolean value:
"0" -acquisition not in progress
"1" -acquisition in progress

Example MMEM4:ACQ?

MMEMory:FREQuency

Description This command changes the acquisition frequency.

Syntax MMEM(0..26):FREQ<space><value>[<space>HZ]

Parameters The value parameter is the new frequency of the acquisition in hertz (number of values acquired every second). For example, if you enter "2", one measurement will be acquired every ½ second. If you enter "0.25", one measurement will be acquired every 4 seconds.
Valid values are "2" or any value between "0.0001" and "1".

Example MMEM4:FREQ 2

MMEMory:FREQuency?

Description This query returns the acquisition frequency.

Syntax MMEM(0..26):FREQ?

Response The acquisition frequency in hertz. Valid values are "2" or any value between "0.0001" and "1".

Example MMEM4:FREQ?

READ[:SCALar]:POWer:DC?

Description This query returns the current power value in the current power unit. The result is the same as if you used the INIT:IMM command or the FETCH:SCAL:POW:DC? query.

Syntax READ(0..26)[:SCAL]:POW:DC?

Response A power value in the "±999.999" format. The number of digits after the decimal point depends on the current resolution.

Example READ4:SCAL:POW:DC?

See also FETC:SCAL:POW:DC?, INIT:CONT, INIT:CONT?, and INIT:IMM

READ[:SCALar]:POWer:WAVelength?

Description This query returns the current wavelength or frequency value.

Syntax READ(0..26)[:SCAL]:POW:WAV?

Response A wavelength (nm) or frequency (Hz) value (depending on the current spectral unit) in the "±9999.9999" format.

Example READ4[:SCAL]:POW:WAV?

See also FETC:SCAL:POW:WAV?, SENS:WAV:RANG?, SENS:WAV:UNIT, SENS:WAV:UNIT?, and UNIT:WAV

SENSitivity:AVERage:STATe

Description This command activates or deactivates data averaging.

Syntax SENS(0..26):AVER:STAT<space><boolean>

Parameters The <boolean> parameter can be:
"0" -deactivate data averaging
"1" -activate data averaging

Example SENS4:AVER:STAT 1

SENSitivity:AVERage:STATe?

Description This query returns a value indicating whether data averaging is enabled or disabled.

Syntax SENS(0..26):AVER:STAT?

Response "0" -averaging is off
"1" -averaging is on

Example SENS4:AVER:STAT?

SENSitivity:AVERage:USER

Description This command modifies the number of scans used for data averaging.

Syntax SENS(0..26):AVER:USER<space><scans>

Parameters The <scans> parameter is the number of scans to use for data averaging in the "9999" format. The value must be between 2 and 1000.

Example SENS4:AVER:USER 250

SENSitivity:AVERage:USER?

Description This query returns the number of scans used for data averaging.

Syntax SENS(0..26):AVER:USER?

Response The number of scans used for data averaging in the "9999" format, between 2 and 1000.

Example SENS4:AVER:USER?

SENSitivity:CORRection:CALibrate

Description This command is used to perform a wavelength calibration.

Syntax SENS(0..26):CORR:CAL<space><value>[<space>units]

Parameters The <value> parameter represents the wavelength for which the calibration will be performed in the "9999.999" (nm) or "999.9999" (THz) format.

The <units> parameter is optional and indicates the spectral unit of the calibrated wavelength (NM or THZ).

Example SENS4:CORR:CAL 1550 NM

SENSitivity:CORRection:MEDium

Description This command is used to change the current medium.

Syntax SENS(0..26):CORR:MED<space><medium>

Parameters The <medium> parameter represents the new medium:

"0" or "AIR" -switch the medium to air

"1" or "VAC" -switch the medium to vacuum

Note If you are conducting tests in air, you should specify the ambient temperature with the SENS:CORR:TEMP command.

Example SENS4:CORR:MED 0

SENSitivity:CORRection:MEDium?

Description This query returns the current medium.

Syntax SENS(0..26):CORR:MED?

Response "0" -the medium is air
"1" -the medium is vacuum

Example SENS4:CORR:MED?

SENSitivity:CORRection:OFFSet:FREQuency

Description This command is used to modify the frequency offset.

Syntax SENS(0..26):CORR:OFFS:FREQ<space><offset>[THZ]

Parameters The <offset> parameter is the new frequency offset (in THz) in the "±9.9999" format. The value must be between "-9.9999" and "9.9999".
"THZ" is optional and specifies units are terahertz.

Example SENS4:CORR:OFFS:FREQ 3.125

SENSitivity:CORRection:OFFSet:FREQuency?

Description This query returns the current frequency offset.

Syntax SENS(0..26):CORR:OFFS:FREQ?

Response The current frequency offset (inTHz) in the "±9.9999" format, between "-9.9999" and "9.9999".

Example SENS4:CORR:OFFS:FREQ?

SENSitivity:CORRection:OFFSet:MAGNitude

Description This command is used to modify the power offset.

Syntax SENS(0..26):CORR:OFFS:MAGN<space><offset>[DB]

Parameters The <offset> parameter is the new power offset (in dB) in the "±9.99" format. The value must be between -3.01 and 3.01.
"DB" is optional and specifies units are dB.

Example SENS4:CORR:OFFS:MAGN 2.12

SENSitivity:CORRection:OFFSet:MAGNitude?

Description This query returns the current power offset.

Syntax SENS(0..26):CORR:OFFS:MAGN?

Response The current power offset (in dB) in the "±9.99" format, between -3.01 and 3.01.

Example SENS4:CORR:OFFS:MAGN?

SENSitivity:CORRection:OFFSet:WAVelength

Description This command is used to modify the wavelength offset.

Syntax SENS(0..26):CORR:OFFS:WAV<space><offset>

Parameters The <offset> parameter is the new wavelength offset (in nm) in the "±9.999" format. The value must be between "-9.999" and "9.999".
"NM" is optional and specifies units are nanometers.

Example SENS4:CORR:OFFS:WAV 2.125

SENSitivity:CORRection:OFFSet:WAVelength?

Description This query returns the current wavelength offset.

Syntax SENS(0..26):CORR:OFFS:WAV?

Response The current wavelength offset (in nm) in the "±9.999" format, between "-9.999" and "9.999".

Example SENS4:CORR:OFFS:WAV?

SENSitivity:CORRection:TEMPerature

Description This command changes the temperature value used for wavelength calculation in air.

Syntax SENS(0..26):CORR:TEMP<space><value>

Parameters The <value> parameter is a temperature value (in °C) in the "99.9" format. The value must be between 0.0 and 55.0.

Note Only temperatures in Celcius are supported.

Example SENS4:CORR:TEMP 26.2

SENSitivity:CORRection:ZERO

Description This command performs an offset nulling measurement.

Syntax SENS(0..26):CORR:ZERO

Example SENS4:CORR:ZERO

SENSitivity:POWer:REFerence?

Description This query returns the reference power.

Syntax SENS(0..26):POW:REF?

Response The current reference value in the "±99.99" (dB) or "99.999" (mW) format. The measurement unit of the response depends on the current power unit (dBm or W). The number of digits after the decimal point depends on the current resolution.

Example SENS4:POW:REF?

See also SENS:POW:REF:DISP, SENS:POW:REF:OFF, and SENS:POW:REF:USER

SENSitivity:POWer:REFerence:DISPlay

Description This command stores the current power value as a reference.

Syntax SENS(0..26):POW:REF:DISP

Example SENS4:POW:REF:DISP

See also SENS:POW:REF?, SENS:POW:REF:OFF, and SENS:POW:REF:USER

SENSitivity:POWer:REFerence:OFF

Description This command reverts the IQ-5310 Wavelength Meter to Absolute mode.

Syntax SENS(0..26):POW:REF:OFF

Example SENS4:POW:REF:OFF

See also SENS:POW:REF?, SENS:POW:REF:DISP, and SENS:POW:REF:USER

SENSitivity:POWer:REFerence:USER

Description This command is used to store a specific reference value.

Syntax SENS(0..26):POW:REF:USER<space><value>[<space>units]

Parameters The <value> parameter is the new reference. Accepted values depend on the module configuration.
The <units> parameter is optional and represents the unit of the new reference (DBM or W). If the unit is not specified, the new reference is assumed to be in the current unit.

Example SENS4:POW:REF:USER 3.745 DBM

See also SENS:POW:REF?, SENS:POW:REF:DISP, and SENS:POW:REF:OFF

SENSitivity:POWer:UNIT

Description This command changes the power unit.

Syntax SENS(0..26):POW:UNIT<space><units>

Parameters The <units> parameter represents the new power unit:
"0" or "W" -switch power unit to W
"1" or "DBM" -switch power unit to dBm

Example SENS4:POW:UNIT 1

See also SENS:POW:UNIT? and UNIT:POW

SENSitivity:POWer:UNIT?

Description This query returns the current power unit.

Syntax SENS(0..26):POW:UNIT?

Response "0" -W
"1" -dBm

Example SENS4:POW:UNIT?

See also SENS:POW:UNIT and UNIT:POW

SENSitivity:WAVelength:RANge?

Description This query returns the wavelength range of the source.

Syntax SENS(0..26):WAV:RAN?

Response Two wavelengths in the "9999 9999" format. The first wavelength is the lower limit of the wavelength range. The second wavelength is the upper limit of the wavelength range.

Example SENS4:WAV:RAN?

See also FETC:SCAL:POW:WAV?, READ:SCAL:POW:WAV?, SENS:WAV:UNIT, SENS:WAV:UNIT?, and UNIT:WAV

SENSitivity:WAVelength:REFerence?

Description This query returns the reference wavelength or reference frequency (nm or THz).

Syntax SENS(0..26):WAV:REF?

Response The current spectral reference.
If the current spectral units are nanometers, the return value will be a wavelength in the "9999.999" format.
If the current spectral units are terahertz, the return value will be a frequency in the "999.9999" format.

Example SENS4:WAV:REF?

See also SENS:WAV:REF:DISP, SENS:WAV:REF:OFF, and SENS:WAV:REF:USER

SENSitivity:WAVelength:REFerence:DISPlay

Description This command stores the current wavelength or frequency value as reference.

Syntax SENS(0..26):WAV:REF:DISP

Example SENS4:WAV:REF:DISP

See also SENS:WAV:REF?, SENS:WAV:REF:OFF, and SENS:WAV:REF:USER

SENSitivity:WAVelength:REFerence:OFF

Description This command reverts the IQ-5310 Wavelength Meter to Absolute mode.

Syntax SENS(0..26):WAV:REF:OFF

Example SENS4:WAV:REF:OFF

See also SENS:WAV:REF?, SENS:WAV:REF:DISP, and SENS:WAV:REF:USER

SENSitivity:WAVelength:REFerence:USER

Description This commmand is used to store a specific spectral reference.

Syntax SENS(0..26):WAV:REF:USER<space><value>[<space>units]

Parameters The <value> parameter is the new spectral reference in nanometers or in terahertz. If the current spectral units are nanometers, the format must be "9999.999".
If the current spectral units are terahertz, the format must be "999.9999".
The <units> parameter is optional and represents the units of the new reference (NM or THZ). If the units are not specified, the new reference is assumed to be the current spectral units.

Example SENS4:WAV:REF:USER 1310 NM

See also SENS:WAV:REF?, SENS:WAV:REF:DISP, and SENS:WAV:REF:OFF

SENSitivity:WAVelength:UNIT

Description This command selects the spectral unit (nanometers or terahertz).

Syntax SENS(0..26):WAV:UNIT<space><units>

Parameters The <units> parameter represents the new spectral unit:
"0" or "NM" -switch to nanometers (wavelength)
"1" or "THZ" -switch to terahertz (frequency)

Example SENS4:WAV:UNIT NM

See also FETC:SCAL:POW:WAV?, READ:SCAL:POW:WAV?, SENS:WAV:RANG?, SENS:WAV:UNIT?, and UNIT:WAV

SENSitivity:WAVelength:UNIT?

Description This query returns a value indicating the current spectral unit (nanometers or terahertz).

Syntax SENS(0..26):WAV:UNIT?

Response A value indicating the current spectral unit:
"0" -wavelength (nm)
"1" -frequency (THz)

Example SENS4:WAV:UNIT?

See also FETC:SCAL:POW:WAV?, READ:SCAL:POW:WAV?, SENS:WAV:RANG?, SENS:WAV:UNIT, and UNIT:WAV

UNIT:POWer

Description This command is used to select the power unit.

Syntax UNIT(0..26):POW<space><units>

Parameters The <units> parameter indicates the new power unit:
"0" or "W" -switch power unit to W
"1" or "DBM" -switch power unit to dBm

Example UNIT4:POW W

See also SENS:POW:UNIT and SENS:POW:UNIT?

UNIT:WAVelength

Description This command is used to select the spectral unit.

Syntax UNIT(0..26):POW<space><units>

Parameters The <units> parameter indicates the new spectral unit:
"0" or "NM" -switch to nanometers (wavelength)
"1" or "THZ" -switch to terahertz (frequency)

Example UNIT4:POW NM

See also FETC:SCAL:POW:WAV?, READ:SCAL:POW:WAV?, SENS:WAV:RANG?, SENS:WAV:UNIT, and SENS:WAV:UNIT?

IQ-5320 Multi-Wavelength Meter Commands

CALCulate:COUNt?

Description This query returns the number of results obtained in the last peak detection.

Syntax CALC(0..26):COUN?

Response A numeric value between 0 and 999.

Example CALC4:COUN?

CALCulate:PEAKlist?

Description This query returns the latest information on a specific peak, in the current unit.

Syntax CALC(0..26):PEAK?<space><peak nb>

Parameters The <peak nb> parameter specifies the peak whose information will be returned (from 1 to 320).

Response The latest information on the specified peak in the "y, z" format, where

"y" is the wavelength in the "9999.999 nm" or "999.9999 THz" format, and

"z" is the power in the "9.999E-009 W" or "99.99 dBm" format.

Example CALC4:PEAK? 23

See also CALC:COUN?

INITiate:ACQuisition:STATe?

Description This query tells you if the acquisition is ready. The acquisition is ready when stabilization time and averaging is complete.

Syntax INIT(0..26):ACQ:STAT?

Parameters "0" means the acquisition is not ready
"1" means the acquisition is ready

Example INIT4:ACQ:STAT?

See also INIT:AUTO, INIT:CONT, INIT:REAL, and INIT:SING

INITiate:AUTOstop

Description This command starts or stops an acquisition in Custom mode. This command changes the current acquisition mode.

Syntax INIT(0..26):AUTO<space><state>

Parameters The <state> parameter is a boolean value:
"1" or "YES" -Start
"0" or "NO" -Stop

Note You should set the total number of scans with the SENS:AVER:COUN command before using the INIT:AUTO command. The results will be averaged over the total number of scans. The module will stop scanning after the number of scans specified with the SENS:AVER:COUN command.

Example INIT4:AUTO 1

See also INIT:ACQ:STAT?, INIT:CONT, INIT:REAL, INIT:SING, and SENS:AVER:COUN

INITiate:CONTinuous

Description This command starts or stops an acquisition in continuous mode. This command changes the current acquisition mode.

Syntax INIT(0..26):CONT<space><state>

Parameters The <state> parameter is a boolean value:
"1" or "YES" -Start
"0" or "NO" -Stop

Note You should set the number of scans over which averaging will take place with the SENS:AVER:COUN command before using the INIT:CONT command.

Example INIT4:CONT 1

See also INIT:ACQ:STAT?, INIT:AUTO, INIT:REAL, INIT:SING, and SENS:AVER:COUN

INITiate:REALtime

Description This command starts or stops an acquisition in continuous mode with Avg = 1. This command changes the current acquisition mode and the number of scans over which results are averaged.

Syntax INIT(0..26):REAL<space><state>

Parameters The <state> parameter is a boolean value:
"1" or "YES" -Start
"0" or "NO" -Stop

Note No averaging in real time.

Example INIT4:REAL 1

See also INIT:ACQ:STAT?, INIT:AUTO, INIT:CONT, and INIT:SING

INITiate:SCAN?

Description This query tells you if the acquisition is running.

Syntax INIT(0..26):SCAN?

Response "0" means the acquisition is not running
"1" means the acquisition is running

Example INIT4:SCAN?

See also INIT:ACQ:STAT? and INIT:REAL

INITiate:SINGle

Description This command starts an acquisition in Auto mode. This command changes the current acquisition mode and the number of scans over which results are averaged.

Syntax INIT(0..26):SING

Parameters "1" or "YES" -Start
"0" or "NO" -Stop

Note This command sets the value of Avg to 8. The module performs 8 scans and then stops.

Example INIT4:SING

See also INIT:ACQ:STAT?, INIT:AUTO, INIT:CONT, INIT:REAL, and INIT:SCAN

INPut:OFFSet:POWer

Description This command changes the power offset. It is equivalent to the SENS:CORR:OFFS:MAGN command.

Syntax INP(0..26):OFFS:POW<space><digit>

Parameters The <digit> parameter is the new power offset (in dB) in the "±9.99" format.

Example INP4:OFFS:POW –3.5

See also INP:OFFS:POW?

INPut:OFFSet:POWer?

Description This query returns the current power offset. It is equivalent to the SENS:CORR:OFFS:MAGN? query.

Syntax INP(0..26):OFFS:POW?

Response The current power offset (in dB) in the "±9.99" format.

Example INP4:OFFS:POW?

See also INP:OFFS:POW

INPut:THReshold:POWer

Description This command modifies the power detection threshold.

Syntax INP(0..26):THR:POW<space><power>

Parameters The <power> parameter is a power value (in dB) in the "±99.99" format.

Note This command will only have an impact on the following acquisitions.

Example INP4:THR:POW 10

See also INP:THR:POW?

INPut:THReshold:POWer?

Description This query returns the current power threshold.

Syntax INP(0..26):THR:POW?

Response The current power threshold (in dB) in the "±99.99" format.

Example INP4:THR:POW?

See also INP:THR:POW

MMEMory:SAVE:TRACe

Description This command saves the active trace in an MWAVE format or TEXT format file.

Syntax MMEM(0..26):SAVE:TRACE<space><fileName>,<0|1>

Parameters The <fileName> parameter corresponds to the complete DOS path and file name under which the trace will be saved.
The <0|1> parameter corresponds to the file format used:
"0" - .MWM format
"1" - .TXT format

Example MMEM4:SAVE:TRAC C:\IQ\Usefile\IQ5320\Test1.MWM,0

SENSitivity:AVERage:COUNt

Description This command changes the number of scans used to compute the final trace.

Syntax SENS(0..26):AVER:COUN<space><digit>

Parameters The <digit> parameter is the number of scans that must be taken into account to compute the final trace in the "99" format.

Example SENS4:AVER:COUN 12

See also INIT:AUTO, INIT:CONT, and SENS:AVER:COUN?

SENSitivity:AVERage:COUNt?

Description This query returns the number of scans used to compute the final trace.

Syntax SENS(0..26):AVER:COUN?

Response The number of scans used to compute the final trace in the "99" format.

Example SENS4:AVER:COUN?

See also SENS:AVER:COUN

SENSitivity:CORRection:COLLect:ZERO

Description This command performs an offset nulling measurement.

Syntax SENS(0..26):CORR:COLL:ZERO

Example SENS4:CORR:COLL:ZERO

SENSitivity:CORRection:MEDium

Description This command is used to set the current medium.

Syntax SENS(0..26):CORR:MED<space><medium>

Parameters The <medium> parameter represents the new medium:
"0" or "AIR" -switch the medium to air
"1" or "VAC" -switch the medium to vacuum

Note If you are conducting tests in air, you should specify the ambient temperature with the SENS:CORR:TEMP command.

Example SENS4:CORR:MED 0

See also SENS:CORR:MED?, SENS:CORR:TEMP, and SENS:CORR:TEMP?

SENSitivity:CORRection:MEDium?

Description This query returns the current medium.

Syntax SENS(0..26):CORR:MED?

Response "0" -the medium is air
"1" -the medium is vacuum

Example SENS4:CORR:MED?

See also SENS:CORR:MED, SENS:CORR:TEMP, and SENS:CORR:TEMP?

SENSitivity:CORRection:OFFSet:MAGNitude

Description This command is used to modify the power offset.

Syntax SENS(0..26):CORR:OFFS:MAGN<space><offset>

Parameters The <offset> parameter is the new power offset (in dB) in the "±9.99" format.

Example SENS4:CORR:OFFS:MAGN 2.12

SENSitivity:CORRection:OFFSet:MAGNitude?

Description This query returns the current power offset.

Syntax SENS(0..26):CORR:OFFS:MAGN?

Response The current power offset (in dB) in the "±9.99" format.

Example SENS4:CORR:OFFS:MAGN?

SENSitivity:CORRection:TEMPerature

Description This command changes the temperature value used for wavelength calculation in air.

Syntax SENS(0..26):CORR:TEMP<space><value>

Parameters The <value> parameter is a temperature value (in °C) in the "99.9" format. The value must be between 0.0 and 55.0.

Note Only temperatures in degrees Celcius are supported.

Example SENS4:CORR:TEMP 26.2

See also SENS:CORR:MED, SENS:CORR:MED?, and SENS:CORR:TEMP?

SENSitivity:CORRection:TEMPerature?

Description This query returns the temperature value used for wavelength calculation in air.

Syntax SENS(0..26):CORR:TEMP?

Response The temperature value (in °C) in the "99.9" format, between 0.0 and 55.0.

Example SENS4:CORR:TEMP?

See also SENS:CORR:MED, SENS:CORR:MED?, and SENS:CORR:TEMP

SENSitivity:FREQuency:RANge?

Description This query returns the frequency range supported by the module.

Syntax SENS(0..26):FREQ:RANG?

Response Two frequencies in the "999.9999" format. The first frequency is the lower limit of the module frequency range. The second frequency is the upper limit of the module frequency range.

Example SENS4:FREQ:RANG?

SENSitivity:POWer:RANGe?

Description This query returns the power range supported by the module.

Syntax SENS(0..26):POW:RANG?

Response Two power values in the "-99.99" (dBm) or "9.999E-999" (W) format. The first power is the lower limit of the module power range. The second power is the upper limit of the module power range.

Note Unit depends on current setting.

Example SENS:POW:RANG?

SENSitivity:WAVelength:RANGe?

Description This query returns the wavelength range supported by the module, taking the current medium into account.

Syntax SENS(0..26):WAV:RANG?

Response Two wavelengths in the "9999.999" format. The first wavelength is the lower limit of the module wavelength range. The second wavelength is the upper limit of the module wavelength range.

Example SENS4:WAV:RANG?

TRACe:DATA?

Description This query returns the power values associated to each of the 2000 following points on the trace.

Syntax TRAC(0..26):DATA?<space><first point>

Parameters The <first point> parameter is the index of the first point in the "9" to "9999" format.

Response A string of power values (in W) associated to each of the 2000 points on the trace, each in the "9.999E-009" format.

Note The IQ-5320 produces a power spectrum whose amplitudes (in W) must be interpreted as power densities. Therefore, if a WDM channel is present on the spectrum, its channel power can be obtained by adding all the power bins that belong to this channel. This implies that precise computation of channel power can be achieved either by knowing (or estimating) the channel central wavelength, its inherent line breadth, and the instrument's spreading effect, or by deriving algorithms well enough to find the channels, where they start and where they end on the spectra.

Example TRAC4:DATA? 195.3425

TRACe:DATA:PREamble?

Description This query returns trace information: the total number of points on the trace, the first and last point wave number values, as well as the total power in W.

Syntax TRAC(0..26):DATA:PRE?

Response The number of points composing the trace in the "99999" format. The first and last wave number values in the "9999.9999" format. The total power in the "9.999E-999" (W) format.

Example TRAC4:DATA:PRE?

See also TRAC:POIN

TRACe:DATA:VALue?

Description This query returns the power value associated to a specific x-axis point on the trace.

Syntax TRAC(0..26):DATA:VAL?<space><position>

Parameters The <position> parameter has the "9999.999" format to indicate the wavelength or frequency (depending on the current unit) for which the power value is searched.

Response The power value associated to the specified point in the "±99.99" (dBm) or "9.999E-999" (W) format, depending on current power unit.
If the specified point does not exist, the response is "over range" or "under range".

Example TRAC4:DATA:VAL? 1560.000

See also TRAC:DATA?

TRACe:POINts?

Description This query returns the number of points that compose the trace.

Syntax TRAC(0..26):POIN?

Response The number of points that compose the trace in the "9999" format. If the specified trace does not exist, the response is "No data".

See also TRAC:DATA:PRE?

UNIT:FREQuency

Description This command sets the spectral unit (nm or THz)

Syntax UNIT(0..26):FREQ<space><units>

Parameters The <units> parameter indicates the new power unit:
"0" or "NM" -switch to nm
"1" or "THZ" -switch to THz

Example UNIT4:FREQ THZ

UNIT:FREQuency?

Description This query returns the current spectral unit.

Syntax UNIT(0..26):FREQ?

Response The current spectral unit: "0" means nanometers and "1" means terahertz.

Example UNIT4:FREQ?

UNIT:POWer

Description This command is used to select the power unit.

Syntax UNIT(0..26):POW<space><units>

Parameters The <units> parameter indicates the new power unit:
"0" or "W" -switch power unit to W
"1" or "DBM" -switch power unit to dBm

Example UNIT4:POW W

UNIT:POWer?

Description This query returns the current power measurement unit.

Syntax UNIT(0..26):POW?

Response The current power measurement unit: "0" means W and "1" means dBm.

Example UNIT4:POW?

IQ-5500 PMD Analyzer Commands

ABORt

Description This command stops any acquisition in progress.

Syntax ABOR(0..26)

Example ABOR3

DISPlay:FIT

Description This command activates or deactivates Gaussian display.

Syntax DISP(0..26):FIT<space><0|1>

Parameters The <0|1> parameter represents the state of the Gaussian display:
"0" -deactivate Gaussian display
"1" -activate Gaussian display.

Example DISP3:FIT 0

See also DISP:MARK, DISP:MARK?, DISP:SCAL, and DISP:SCAL?

DISPlay:FIT?

Description This query indicates whether Gaussian display is activated or deactivated.

Syntax DISP(0..26):FIT?

Response A boolean value:
"TRUE" -Gaussian display is activated
"FALSE" -Gaussian display is deactivated.

Example DISP3:FIT?

See also DISP:MARK, DISP:MARK?, DISP:SCAL, and DISP:SCAL?

DISPlay:MARKer

Description This command shows or hides markers.

Syntax DISP(0..26):MARK<space><0|1>

Parameters The <0|1> parameter represents the state of the markers:
"0" -hide markers
"1" -show markers.

Example DISP3:MARK 0

See also DISP:FIT, DISP:FIT?, DISP:SCAL, and DISP:SCAL?

DISPlay:MARKer?

Description This query indicates whether the markers are shown or hidden.

Syntax DISP(0..26):MARK?

Response A boolean value:
"0" -markers are hidden
"1" -markers are shown.

Example DISP3:MARK?

See also DISP:FIT, DISP:FIT?, DISP:SCAL, and DISP:SCAL?

DISPlay:SCALe

Description This command shows or hides the sensitivity scale.

Syntax DISP(0..26):SCAL<space><0|1>

Parameters The <0|1> parameter represents the state of the sensitivity scale:
"0" -hide sensitivity scale
"1" -show sensitivity scale.

Example DISP3:SCAL 1

See also DISP:FIT, DISP:FIT?, DISP:MARK, and DISP:MARK?

DISPlay:SCALe?

Description This query indicates whether the sensitivity scale is shown or hidden.

Syntax DISP(0..26):SCAL?

Response A boolean value:
"0" -sensitivity scale is hidden
"1" -sensitivity scale is shown.

Example DISP3:SCAL?

See also DISP:FIT, DISP:FIT?, DISP:MARK, and DISP:MARK?

FETCh?

Description This query returns the PMD delay and coefficient values stored into the stack.

Syntax FETC(0..26)?

Response Two values in the "99.999,99.999" format. The first value is the PMD delay and the second value is the PMD coefficient.

Example FETC3?

See also INIT:CONT, INIT:CONT?, and INIT:IMM

FETCh:SENSitivity?

Description This query returns the power of the signal as currently read on a sensitivity scale from 0 to 5. This command is only available in PMD mode.

Syntax FETC(0..26)SENS?

Response A value between 0 and 5 in the "9.999" format.

Example FETC3:SENS?

FETCh:STATe?

Description This query returns the validity of an acquired trace.

Syntax FETC(0..26):STAT?

Response A boolean value:
"TRUE" -the trace is valid
"FALSE" -the trace is not valid

Note To store measurements into the stack, use the INIT:CONT or INIT:IMM command.

Example FETC3:STAT?

INITiate:CONTinuous

Description This command starts one or more acquisitions, depending on how the SENS:POW:COUN and SENS:POW:DEL commands have been set.

Syntax INIT(0..26):CONT<space><state>

Parameters The <state> parameter is a boolean value:
"1" -start acquisitions
"0" -stop acquisitions

Example INIT3:CONT 1

See also INIT:CONT?, INIT:IMM, SENS:POW:COUN, and SENS:POW:DEL

INITiate:CONTinuous?

Description This query returns a value indicating whether an acquisition is in progress.

Syntax INIT(0..26):CONT?

Response A boolean value:
"1" -acquisition in progress
"0" -acquisition not in progress

Example INIT3:CONT?

See also INIT:CONT, INIT:IMM, and FETC?

INITiate[:IMMediate]

Description This command starts a single acquisition.

Syntax INIT(0..26)[:IMM]

Example INIT3:IMM

See also INIT:CONT, INIT:CONT?, and FETC?

INSTrument:CATalog?

Description This query returns a list of light sources available in the IQ system as it is currently configured.

Syntax INST(0..26):CAT?<space>[moduleType],[mode]

Parameters The <moduleType> parameter is optional and represents the type of module for which you want to have a list:

"SRC"-to have a list of light source modules

If you are asking for a list of light source modules, use the <mode> parameter (which is optional) to be even more specific on the type of source you are looking for:

"0" -to ask for sources to be used in PMD mode

Note If no value is entered for the <moduleType> parameter, it will be considered as "SRC". If no value is entered for the <mode> parameter, it will be considered as "0". If the <moduleType> parameter is absent, the <mode> parameter must not be present.

Response The list of light sources available in the IQ system in the format "99,99,99...". Return values represent slots in the IQ system.

Examples INST3:CAT? (to obtain a list of sources to be used in PMD mode)

See also INST:SEL and INST:SEL?

INSTrument[:SELect]

Description This command selects a source.

Syntax INST(0..26)[:SEL]<space><slot>[,<moduleType>][,<mode>]

Parameters The <slot> parameter specifies the location of the selected source. The value must be between 0 and 26. It represents a slot number in the IQ system in the "99" format.

The <moduleType> parameter is optional and represents the type of the selected module:

"SRC" -light source module

If you are selecting a light source module, you can use the <mode> parameter (which is optional) to be even more specific on the type of source you are selecting:

"0" -source to be used in PMD mode

Note If no value is entered for the <moduleType> parameter, it will be considered as "SRC". If no value is entered for the <mode> parameter, it will be considered as "0". If the <moduleType> parameter is absent, the <mode> parameter must not be present.

Example INST3:SEL 4,SRC,2

See also INST:CAT? and INST:SEL?

INSTrument:SELect?

Description This query returns the location of the source currently selected in the IQ system.

Syntax INST(0..26)SEL?<space>[moduleType],[mode]

Parameters The <moduleType> parameter is optional and represents the type of module that you are looking for:
"SUPP" -to look for a polarization selector module
If you are looking for the light source module, use the <mode> parameter (which is optional) to be even more specific on the type of source you are looking for:
"0" -to ask for the source to be used in PMD mode

Note If no value is entered for the <moduleType> parameter, it will be considered as "SRC". If no value is entered for the <mode> parameter, it will be considered as "0". If the <moduleType> parameter is absent, the <mode> parameter must not be present.

Response The list of light sources available in the IQ system in the "99,99,99..." format. Return values represent slots in the IQ system.

Examples INST3:SEL? (to look for the source to be used in PMD mode)

See also INST:CAT? and INST:SEL

MEMory:CLEar

Description This command clears all the traces from the Selection page.

Syntax MEM(0..26):CLE

Note This command does not erase the trace from the storage device.

Example MEM4:CLE

MEMory:DATA

Description This command changes the entries in the DUT, Comment 1, and Comment 2 fields.

Syntax MEM(0..26):DATA<space><field>,<data>

Parameters The <field> parameter identifies the field to be edited:

"DUT" -to edit the DUT field
"Comment1" -to edit the Comment 1 field
"Comment2" -to edit the Comment 2 field

The <data> parameter is the information to be entered in a 60-character field.

Example MEM3:DATA DUT,This DUT was pinched.

MEMory:DATA?

Description This query returns the contents of the DUT, Comment 1, or Comment 2 fields.

Syntax MEM(0..26):DATA?<space><field>

Parameters The <field> parameter identifies the field whose contents will be returned:

"DUT" -to fetch the contents of the DUT field
"Comment1" -to fetch the contents of the Comment 1 field
"Comment2" -to fetch the contents of the Comment 2 field

Response The contents of specified field (60 characters maximum).

Example MEM3:DATA? Comment1

MEMory:DELete

Description This command clears the trace currently open from the screen and erases it from the storage device.

Syntax MEM(0..26):DEL

Example MEM3:DEL

MEMory:FILE

Description This command saves the currently open trace.

Syntax MEM(0..26):FILE<space><fileName>

Parameters The <fileName> parameter corresponds to the complete DOS path and file name under which the PMD trace will be saved. If only a file name is entered, the trace will be saved to the default location (C:\IQ\USERFILE\IQ5500\).

Note For easier management, file names should be limited to eight characters and the extension ".PMD" should be given to PMD trace files.

Example MEM3:FILE C:\TRACES\PMD\DUT12345.PMD

MEMory:FILE?

Description This query returns the file name of the currently open trace.

Syntax MEM(0..26):FILE?

Response The complete DOS path and file name of the currently open PMD trace in the "C:\TRACES\PMD\DUT12345.PMD" format.

Example MEM3:FILE?

MEMory:LENgth

Description This command is used to specify the length of the fiber under test. This command is only available for weak mode coupling and strong mode coupling fiber types.

Syntax MEM(0..26):LEN<space><length>

Parameters The <length> parameter represents the length of the fiber under test (in kilometers) in the "9999.999" format. The value must be between 0.001 and 9999.999.

Example MEM3:LEN 1324.465

MEMory:LENgth?

Description This query returns the length currently set for the fiber under test. This query is only available for weak mode coupling and strong mode coupling fiber types.

Syntax MEM(0..26):LEN?

Response The length currently set for the fiber under test (in kilometers) in the "9999.999" format, between 0.001 and 9999.999.

Example MEM3:LEN?

MEMory:TABLe:CURRent:DATA?

Description PMD acquisition data is used to plot a PMD trace. This command returns the coordinates of every point on the current PMD trace.

Syntax MEM(0..26):TABL:CURR:DATA?

Response The coordinates of every point on the current PMD trace. PMD acquisitions provide an (x,y) reading: "±99.999,99.999;±99.999,99.999;±99.999,99.999..."

Example MEM3:TABL:CURR:DATA?

MEMory:TABLe:CURRent:MAGNitude:POINts?

Description This query returns the total number of points that compose the current PMD trace.

Syntax MEM(0..26):TABL:CURR:MAGN:POIN?

Response The total number of points that compose the current PMD trace in the "9999" format.

Example MEM3:TABL:CURR:MAGN:POIN?

MEMory:TYPE

Description This command selects the type of the fiber under test.

Syntax MEM(0..26):TYPE<space><type>

Parameters The <type> parameter represents the type of the fiber under test:

"Strong"	-for strong coupling mode fibers
"Weak"	-for weak coupling mode fibers
"Component"	-to measure the low PMD values of passive components

Note If you do not know whether or not your fiber has weak polarization mode coupling, you should start by making a single acquisition using the strong coupling setting. If the resulting trace has a wide main peak with one peak on each side, it is very likely that you are testing a weak mode coupling fiber.

Example MEM3:TYPE Weak

MEMory:TYPE?

Description This query returns the type currently set for the fiber under test (Strong, Weak, Component).

Syntax MEM(0..26):TYPE?

Response A text string representing the type currently set for the fiber under test:

"Strong"	-for strong coupling mode fibers
"Weak"	-for weak coupling mode fibers
"Component"	-to measure the low PMD values of passive components

Example MEM3:TYPE?

MEMory:USER

Description This command changes the user name as currently set in the IQ system. Any alphanumeric character is allowed (max. 60).

Syntax MEM(0..26):USER<space><name>

Parameter The <name> parameter is the name of the person that will operate the IQ-5500 PMD Multi-Analyzer.

Example MEM3:USER John Smith

MEMory:USER?

Description This query returns the user name as currently set in the IQ system.

Syntax MEM(0..26):USER?

Response The user name as currently set in the IQ system.

Example MEM3:USER?

SENSitivity:POWer:COUNt

Description This command specifies the number of scans to be performed.

Syntax SENS(0..26):POW:COUN<space><scan>

Parameters The <scan> parameter indicates the number of scans to be performed in the "9999" format. The value must be between 0 and 9999.

Example SENS3:POW:COUN 2419

SENSitivity:POWer:COUNt?

Description This query returns the number of scans to be performed.

Syntax SENS(0..26):POW:COUN?

Response The number of scans to be performed in the "9999" format, between 0 and 9999.

Example SENS3:POW:COUN?

SENSitivity:POWer:DELay

Description This command specifies the delay between scans.

Syntax SENS(0..26):POW:DEL<space><time>

Parameters The <time> parameter indicates the delay between scans (in seconds) in the "99999" format. The value must be between 2 and 86399.

Example SENS3:POW:DEL 36200

SENSitivity:POWer:DELay?

Description This query returns the current delay between scans.

Syntax SENS(0..26):POW:DEL?

Response The current delay between scans (in seconds) in the "99999" format, between 2 and 86399.

Example SENS3:POW:DEL?

SENSitivity:POWer:MODE?

Description This query returns the current scanning mode.

Syntax SENS(0..26):POW:MODE?

Response A value representing the current scanning mode:

"PMD"	-to indicate regular PMD mode
"FAST"	-to indicate Fast Scan PMD mode
"ERPMD"	-to indicate extended range PMD mode
"AUTOPMD"	-to indicate automatic mode

Example SENS3:POW:MODE?

SENSitivity:POWer:RANGe

Description The total scanning range of the IQ-5500 is divided into 7 sub-ranges, each being assigned with an index. To obtain the range attributed to each index, use the SENS:POW:RANG:LIST? query. The SENS:POW RANG command selects a scanning range index.

Syntax SENS(0..26):POW:RANG<space><index>[,mode]

Parameters The <index> parameter represents the index of the new scanning range in the "9" format. In PMD scanning mode, valid values are from 1 to 7. In FAST, ERPMD, and AUTOPMD scanning modes, the only valid value is 1.

The <mode> parameter is optional and represents the mode to which the new scanning range will apply:

"PMD" -to indicate regular PMD mode

"FAST" -to indicate Fast Scan PMD mode

"ERPMD" -to indicate extended range PMD mode

"AUTOPMD" -to indicate automatic mode

If the mode is not specified, the new scanning range index will apply to PMD mode.

Example SENS3:POW:RANG 1,PMD

See also SENS:POW:RANG? and SENS:POW:RANG:LIST?

SENSitivity:POWer:RANGe?

Description This query returns the current scanning range index.

Syntax SENS(0..26):POW:RANG?

Response The index of the current scanning range in the "9" format. In PMD scanning mode, return values will be from 1 to 7. In FAST, ERPMD, and AUTOPMD scanning modes, the only possible return value is 1.

Example SENS3:POW:RANG?

See also SENS:POW:RANG and SENS:POW:RANG:LIST?

SENSitivity:POWer:RANGe:LIST?

Description The total scanning range of the IQ-5500 is divided into 7 sub-ranges, each being assigned with an index (1 to 7). This query returns the range attributed to each index.

Syntax SENS(0..26):POW:RANG:LIST?[<space>mode]

Parameters The <mode> parameter is optional and specifies the mode for which the scanning range indexes will be returned:

"PMD"	-regular PMD mode
"FAST"	-Fast Scan mode
"ERPMD"	-extended range PMD mode
"AUTOPMD"	-automatic mode

Response A list with all the available indexes with their matching scanning ranges.

In PMD scanning mode, the list will include 7 indexes in the "1: 1.0 to 2.0 ps (±20 0 μm)" format.

In FAST scanning mode, the list will include 1 index in the "1: 10.0 to 32.0 ps (±4 000 μm)" format.

In ERPMD scanning mode, the list will include 1 index in the "1: 27.0 to 80.0 ps (±10 000 μm)" format.

In AUTOPMD scanning mode, the list will include 1 index in the "1: 1.0 to 2.0 ps (±400 μm)" format.

Example SENS3:POW:RANG:LIST?

See also SENS:POW:RANG and SENS:POW:RANG?

SENSitivity:POWer:WAVelength

Description This command changes the wavelength on the IQ-5500.

Syntax SENS(0..26):POW:WAV<space><wavelength>[NM]

Parameters The <wavelength> parameter represents the new wavelength (in nm) in the "9999" format. The unit (NM) is optional. The value must be 1310 or 1550.

Example SENS3:POW:WAV 1310NM

SENSitivity:POWer:WAVelength?

Description This query returns the current wavelength.

Syntax SENS(0..26):POW:WAV?

Response The current wavelength (in nm) in the "9999" format.

Example SENS3:POW:WAV?

IQ-6100 EDFA Commands

AMPlifier:PROTection:HARdExist?

Description This query returns a value indicating whether the integrated remote interlock connector is present.

Syntax AMP(0..26):PROT:HARE?

Response A boolean value:
"1" -interlock connector is present
"0" -interlock connector is not present

Example AMP3:PROT:HARE?

AMPlifier:PROTection:HARdState?

Description This query returns a value indicating the status of the integrated interlock connector.

Syntax AMP(0..26):PROT:HARS?

Response A boolean value:
"1" -interlock connector is open
"0" -interlock connector is closed

Example AMP3:PROT:HARS?

AMPlifier:PROTection:RemovePassWorD

Description This command allows you to remove the software protection password.

Syntax AMP(0..26):PROT:RPWD

Example AMP3:PROT:RPWD

See also AMP:PROT:SOFE? and AMP:PROT:SOFS?

AMPlifier:PROTection:SetPassWorD

Description This command allows you to enter the software protection password.

Syntax AMP(0..26):PROT:SPWD<string>

Parameters The "safekey" string.

Note Entering the password is necessary to activate the EDFA.

Example AMP3:PROT:SPWDsafekey

See also AMP:PROT:SOFE? and AMP:PROT:SOFS?

AMPlifier:PROTection:SOFtExist?

Description This query returns a value indicating whether a software key-activated master control is present.

Syntax AMP(0..26):PROT:SOFE?

Response A boolean value:
"1" -software key is present
"0" -software key is not present

Note This software key-activated master control is only present if you clicked "Yes" in the safety dialog box during installation.

Example AMP3:PROT:SOFE?

See also AMP:PROT:RPWD, AMP:PROT:SOFS?, and AMP:PROT:SPWD

AMPlifier:PROTection:SOFtState?

Description This query returns the status of the software key-activated master control.

Syntax AMP(0..26):PROT:SOFS?

Response A boolean value:
"1" -software key is activated
"0" -software key is not activated

Example AMP3:PROT:SOFS?

See also AMP:PROT:RPWD, AMP:PROT:SOFE?, and AMP:PROT:SPWD

AMPlifier:STAte

Description This function turns on and off the EDFA. When the EDFA is on, the red LED on the front of the module illuminates.

Syntax AMP(0..26):STA<space><state>

Parameters The <state> parameter is a boolean parameter:
"1" -turn on the source
"0" -turn off the source

Example AMP3:STA 1

AMPlifier:STAte?

Description This query returns the state of the EDFA (on or off).

Syntax AMP(0..26):STA?

Response A boolean value indicating the state of the EDFA:
"1" -the source is on
"0" -the source is off

Example AMP3:STA?

IQ-7000 OTDR Commands

Typographical Conventions

Complex item: indicates that the description will be, or has already been, developed (italic)

[Optional item]: indicates that the item is optional ([ ])

<Parameter>: describes a parameter (< >)

Significant item: indicates a significant item used as such in the text (bold)

ABORt

Description This command stops any measurement in progress.

Syntax ABOR(0..26)

Example ABOR4

See also INIT

DIAGnose:DEBug

Description This command performs a self-test of the OTDR module. A message is returned if the self-test is not successful.

Syntax DIAG(0..26):DEB

Example DIAG4:DEB

See also INF:HELP?

INFormation:CABLe:ID

Description This command is used to identify the cable under test.

Syntax INF(0..26):CABL:ID<space><cable_id>

Parameters The <cable_id> parameter represents the user-defined cable identifier.

Example INF4:CABL:ID Cable 567-i6

See also INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:CABLe:MANufacturer

Description This command is used to identify the name of the cable manufacturer.

Syntax INF(0..26):CABL:MAN<space><manufacturer_name>

Parameters The <manufacturer_name> parameter represents the user-defined name of the cable manufacturer.

Example INF4:CABL:MAN EXFOcable

See also INF:CABL:ID, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:CABLe:TYPe

Description This command is used to set the cable type.

Syntax INF(0..26):FIB:TYP<space><cable_type>

Parameters The <cable_type> parameter represents the user-defined type of the fiber under test.

Example INF4:FIB:TYP cable type xx1.

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:FIBer:ID

Description This command is used to identify the fiber under test.

Syntax INF(0..26):FIB:ID<space><fiber_id>

Parameters The <fiber_id> parameter represents the user-defined identifier of the fiber under test.

Example INF4:FIB:ID Fib012

See also INF:CABL:ID, INF:CABL:MAN, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:GENeral:CONTractor

Description This command is used to set the name of the contractor.

Syntax INF(0..26):GEN:CONT<space><contractor>

Parameters The <contractor> parameter represents the user-defined name of the contractor.

Example INF4:GEN:CONT Smith & Co.

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:GENeral:CUSTomer

Description This command is used to set the name of the customer.

Syntax INF(0..26):GEN:CUST<space><customer>

Parameters The <customer> parameter represents the user-defined name of the customer.

Example INF4:GEN:CUST Smith

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:GENeral:JOBId

Description This command is used to set the name of the job being performed.

Syntax INF(0..26):GEN:JOB<space><job_id>

Parameters The <job_id> parameter represents the user-defined name of the task performed.

Example INF4:GEN:JOB 56t-guX2

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:GENeral:REASon

Description This command is used to set the reason for which the acquisition is to be performed.

Syntax INF(0..26):GEN:REAS<space><reason>

Parameters The <reason> parameter represents the user-defined reason for the acquisition.

Example INF4:GEN:REAS faulty connection

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:HELP

Description This command is used to return the set of commands, parameters, and descriptions accepted by the OTDR module.

Syntax INF(0..26):HELP?

Response OTDR module information as follows:
<number_of_characters><space>{ <name>
{ [*parameters*] {<description>
where
<number_of_characters> is the number of characters after the space,
<space> is the space character,
<name> is the command name
[*parameters*] are optional parameters, and
<description> is a short description of the displayed command.

Example Commands are given one after the other as shown in the following example:
... {DIAG:DEB { {This command performs a self-test of the OTDR module. A message is returned if the self-test is not successful. {INF:HELP? { {This command is used to return the set of commands, parameters, and descriptions accepted by the OTDR module. {SENS:POW:INIT { {This command is used to initialize the OTDR module. ....

See also DIAG:DEB

INFormation:LOCation:APOint:NAMe

Description This command is used to specify the location of point "A".

Syntax INF(0..26):LOC:APO:NAM<space><name>

Parameters The <name> parameter represents the user-defined name of the location of point "A".

Example INF4:LOC:APO:NAM QCpointA

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:LOCation:APOint:OPERator

Description This command is used to specify the operator's name at point "A".

Syntax INF(0..26):LOC:APO:OPER<space><name>

Parameters The <name> parameter represents the user-defined name of the operator at point "A".

Example INF4:LOC:APO:OPER MikeH

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:BPO:NAM, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:LOCation:BPOint:NAMe

Description This command is used to specify the location of point "B".

Syntax INF(0..26):LOC:BPO:NAM<space><name>

Parameters The <name> parameter represents the user-defined name of the location of point "B".

Example INF4:LOC:BPO:NAM MTLpointB

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:OPER, and INF:TRAC

INFormation:LOCation:BPOint:OPERator

Description This command is used to specify the operator's name at point "B".

Syntax INF(0..26):LOC:BPO:OPER<space><name>

Parameters The <name> parameter represents the user-defined name of the operator at point "B".

Example INF4:LOC:APO:OPER CliveK

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, and INF:TRAC

INFormation:MODule:FACTory?

Description This query returns the number of lasers available, valid ranges, valid pulses, PIID (see INF:MOD:PII?), and ID information (see INF:MOD:ID?).

Syntax INF(0..26):MOD:FACT?

Response A character string representing all the information needed for the remote control of the OTDR via GPIB as follows:

PIID information ; number of lasers ; laser$_1$; [laser$_2$]

where

PIID information is the information returned by the INF:MOD:PII? query

number of lasers:<number_of_lasers> **Laser** ;

laser$_i$: **Laser #** <laser_index> **Wavelength** <wavelength_ value> **Rbs** <RBS_value> ; *Range$_1$* ; *Range$_2$* ; ... ; *Range$_n$* ;

range$_j$: **Range #** <range_index> **at** <range_value>; *Pulse$_1$* ; *Pulse$_2$* ; ... ; *Pulse$_k$* ;

pulse$_p$: **Pulse #** <pulse_index> **as** <pulse_value>

where <number_of_lasers>, <laser_index>, <range_index>, and <pulse_index> are integers, and

where <wavelength_ value>, <RBS_value>, <range_value>, and <pulse_value> are float values.

Example INF4:MOD:FACT?

See also INF:MOD:ID?, INF:MOD:PII?, SENS:DIST:OFFS, SENS:DIST:RANG, SENS:FACT:HEL, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:INIT, SENS:POW:LIN:BOUN, SENS:POW:LIN:UNI:HIGH, SENS:POW:LIN:UNI:LOW, SENS:POW:LIN:WIND:OFFS, SENS:POW:LIN:WIND:STEP, SENS:POW:LIN:WIND:WIDT, SENS:POW:PULS, SENS:POW:SET?, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

INFormation:MODule:ID?

Description This query returns the identification (type and model) of the OTDR module being used.

Syntax INF(0..26):MOD:ID?

Response One line representing the type and the model of the OTDR module as follows:
<type>, and <model>
where
<type> is the type of OTDR module, and
<model> is the model of OTDR module.

Example INF4:MOD:ID?

See also INF:MOD:FACT? and INF:MOD:PII?

INFormation:MODule:PII?

Description This query returns the information related to the OTDR module concerned.

Syntax INF(0..26):MOD:PII?

Response The following information:
<manufacturer> ; *ID information* ; <serial_number> ; <version_number> ;
where
<manufacturer> is the manufacturer's name,
ID information is the information returned by the INF:MOD:ID? query
<serial_number> is the OTDR serial number, and
<version_number> is the OTDR software version number.

Example INF4:MOD:PII?

See also INF:MOD:FACT? and INF:MOD:ID?

INFormation:TRACe

Description This command is used to specify a text comment on the current trace and/or analysis.

Syntax INF(0..26):TRAC<space><comment>

Parameters The <comment> parameter represents the user-defined information about the trace and/or analysis.

Example INF4:TRAC test successful

See also INF:CABL:ID, INF:CABL:MAN, INF:FIB:ID, INF:CABL:TYP, INF:GEN:CONT, INF:GEN:CUST, INF:GEN:JOB, INF:GEN:REAS, INF:LOC:APO:NAM, INF:LOC:APO:OPER, INF:LOC:BPO:NAM, and INF:LOC:BPO:OPER

INITiate

Description This command is used to start an acquisition using the set parameters.

Syntax INIT(0..26)

Example INIT4

See also ABOR, SENS:FACT:HEL, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:INIT, SENS:POW:LIN:BOUN, SENS:POW:LIN:UNI:HIGH, SENS:BOUN:LIN:UNI:LOW, SENS:POW:LIN:WIND:OFFS, SENS:POW:LIN:WIND:STEP, SENS:POW:LIN:WIND:WIDT, SENS:POW:PULS, SENS:POW:SET?, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

MEMory:IMPort?

Description This query is used to return the trace in memory. There must be a trace in memory, otherwise an error message will be raised.

Syntax MEM(0..26):IMP?

Response The trace in memory as follows:

<number of characters><space><code$_1$><code$_2$>... <code$_n$>

where

<number of characters> is the number of characters after the space. Note: in the case of a file of length "n" (bytes), the number before the space will be 3 n.

<space> is the space characters, and

<code$_n$> is the ASCI code representing the "n" byte of the corresponding file.

Example MEM4:IMP?

MMEMory:IMPort?

Description This query is used to return a specific trace file.

Syntax MMEM(0..26):IMP?<space><filename>

Response The trace file to be imported as follows:

<number of characters><space><code$_1$><code$_2$>... <coden>

where

<number of characters> is the number of characters after the space. Note: in the case of a file of length "n" (bytes), the number before the space will be 3 n.

<space> is the space characters, and

<code$_n$> is the ASCI "n" code representing the "n" byte of the corresponding file.

Example MMEM4:IMP \\machine_name\shared\directory\tracename

MMEMory:SAVe:FORMat

Description This command is used to specify the default save format of the trace.

Syntax MMEM(0..26):SAV:FORM<space><format>

Parameters The <format> parameter is a string containing six digits, each separated by a space:
1) -1 = EXFO, 0 = Bellcore, 1 = ASCII
2) 0 = no information, 1 = information
3) 0 = no event table, 1 = event table
4) 0 = no trace displayed, 1 = trace displayed
5) 0 = no points, 1 = points
6) 0 = 500 points, 1 = all points

Example MMEM4:SAV:FORM -1 0 0 1 0 0 (EXFO)
MMEM4:SAV:FORM 1 1 0 1 1 0 (ASCII, with info and 500 points)

See also MMEM:SAV:TRAC

MMEMory:SAV:TRACe

Description This command is used to save the active trace on file.

Syntax MMEM(0..26):SAV:TRAC<space><filename>

Parameters The <filename> parameter represents the file in which the active trace is to be saved.

Example MMEM4:SAV:TRAC \\machine_name\shared\directory\filename

See also MMEM:SAV:FORM

:PRINt

Description This command is used to print the specified trace.

Syntax PRIN(0..26)[<space><filename>]

Parameters The optional <filename> parameter represents the trace to be printed.

Example PRIN4 \\machine_name\shared\directory\filename

:SENSitivity:DISTance:OFFSet

Description This command is used to specify the acquisition offset, i.e., the distance beyond which loss will not be calculated by the OTDR module, therefore to set the resolution.

Syntax SENS(0..26):DIST:OFFS<space><offset>

Parameters The <offset> parameter represents the offset, i.e., the distance (in meters) beyond which loss will not be calculated by the OTDR.

Example SENS4:DIST:OFF 0.4

See also INF:MOD:FACT?, SENS:DIST:RANG, SENS:FACT:HEL, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:PULS, SENS:POW:SET?, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

SENSitivity:DISTance:RANGe

Description This command is used to specify the range to be considered in the acquisition.

Syntax SENS(0..26):DIST:RANG<space><distance>

Parameters The <distance> parameter represents the range, i.e., the distance (index) which is to be considered in the acquisition.

Example SENS4:DIST:RANG 6

See also INF:MODU:FACT?, SENS:DIST:OFFS, SENS:FACT:HEL, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:PULS, SENS:POW:SET?, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

SENSitivity:FACTor:HELix

Description This command is used to specify the helix factor of the fiber under test.

Syntax SENS(0..26):FACT:HEL<space><helix_factor>

Parameters The <helix_factor> parameter represents the helix factor of the fiber as a percentage. The value must be between 0.00 % and 10.00 %.

Example SENS4:FACT:HEL 0.02

See also INF:MOD:FACT?, INIT, SENS:DIST:OFFS, SENS:DIST:RANG, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:PULS, SENS:POW:SET?, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

SENSitivity:FACTor:IOR

Description This command is used to specify the index of refraction of the fiber under test.

Syntax SENS(0..26):FACT:IOR<space><refraction>

Parameters The <refraction> parameter represents the index of refraction of the fiber. The value must be included between 1.300 and 1.700.

Example SENS4:FACT:IOR 1.486

See also INF:MOD:FACT?, INIT, SENS:DIST:OFFS, SENS:DIST:RANG, SENS:FACT:HEL, SENS:FACT:RBS, SENS:POW:PULS, SENS:POW:SET?, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

SENSitivity:FACTor:RBS

Description This command is used to specify the Rayleigh backscattering factor of the fiber under test.

Syntax SENS(0..26):FACT:RBS<space><rbs>

Parameters The <rbs> parameter represents the Rayleigh backscattering factor at a specific wavelength.

Note The value of the Rayleigh backscattering factor must be provided by the cable manufacturer. If an incorrect value is entered, reflectance measurements will be inaccurate.

Example SENS4:FACT:RBS -82.29

See also INF:MOD:FACT?, INIT, SENS:DIST:OFFS, SENS:DIST:RANG, SENS:FACT:HEL, SENS:FACT:IOR, SENS:POW:PULS, SENS:POW:SET?, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

SENSitivity:POWer:INITialize

Description This command is used to initialize the OTDR module.

Syntax SENS(0..26):POW:INIT

Example SENS4:POW:INIT

See also INF:MOD:FACT? and INIT

SENSitivity:POWer:LINearity:BOUNdary

Description This command is used to specify the linearity boundary. For more information concerning linearity, refer to the corresponding sections in the *IQ-7000 OTDR* Instruction Manual.

Syntax SENS(0..26):POW:LIN:BOUN<space><value>

Parameters The <value> parameter represents the limit for the linearity test.

Example SENS4:POW:LIN:BOUN 4.20

See also INF:MOD:FACT? and INIT

SENSitivity:POWer:LINearity:UNIformity:HIGHer

Description This command is used to specify the maximum attenuation (dB/km) accepted in the analysis window. For more information concerning linearity, refer to the corresponding sections in the *IQ-7000 OTDR* Instruction Manual.

Syntax SENS(0..26):POW:LIN:UNI:HIGH<space><attenuation>

Parameters The <attenuation> parameter represents the upper limit of the attenuation.

Example SENS4:POW:LIN:UNI:HIGH 0.714

See also INF:MOD:FACT?, INIT, and SENS:POW:LIN:UNI:LOW

SENSitivity:POWer:LINearity:UNIformity:LOWer

Description This command is used to specify the minimum attenuation (dB/km) accepted in the analysis window. For more information concerning linearity, refer to the corresponding sections in the *IQ-7000 OTDR* Instruction Manual.

Syntax SENS(0..26):POW:LIN:UNI:LOW<space><attenuation>

Parameters The <attenuation> parameter represents the lower limit of the attenuation.

Example SENS4:POW:LIN:UNI:LOW 0.510

See also INF:MOD:FACT?, INIT, and SENS:POW:LIN:UNI:HIGH

SENSitivity:POWer:LINearity:WINDow:OFFSet

Description This command is used to specify the distance beyond which linearity will not be tested, i.e., the position of the first analysis window.

Syntax SENS(0..26):POW:LIN:WIND:OFFS<space><offset>

Parameters The <offset> parameter represents the distance (in meters) within which linearity will be tested.

Example SENS4:POW:LIN:WIND:OFFS 1.200

See also INF:MOD:FACT?, INIT, SENS:POW:LIN:WIND:STEP, and SENS:POW:LIN:WIND:WIDT

SENSitivity:POWer:LINearity:WINDow:STEP

Description This command is used to specify the step (in meters) for testing linearity.

Syntax SENS(0..26):POW:LIN:WIND:STEP<space><step>

Parameters The <step> parameter represents the step when testing linearity.

Example SENS4:POW:LIN:WIND:STEP 0.5

See also INF:MOD:FACT?, INIT, SENS:POW:LIN:WIND:OFFS, and SENS:POW:LIN:WIND:WIDT

SENSitivity:POWer:LINearity:WINDow:WIDTh

Description This command is used to specify the width (in meters) for testing linearity, i.e., the window width.

Syntax SENS(0..26):POW:LIN:WIND:WIDT<space><width>

Parameters The <width> parameter represents the width when testing linearity.

Example SENS4:POW:LIN:WIND:WIDT 3.2

See also INF:MOD:FACT?, INIT, SENS:POW:LIN:WIND:OFFS and SENS:POW:LIN:WIND:STEP

SENSitivity:POWer:PULSe

Description This command is used to specify the index of the pulse width.

Syntax SENS(0..26):POW:PULS<space><pulse_index>

Parameters The <pulse_index> parameter represents the index of the pulse width.

Example SENS4:POW:PULS 3

See also INF:MOD:FACT?, INIT, SENS:DIST:OFFS, SENS:DIST:RANG, SENS:FACT:HEL, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:SET?, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

SENSitivity:POWer:SETtings?

Description This query returns some user-defined parameters.

Syntax SENS(0..26):POW:SET?

Response Several character strings representing user-defined parameters as follows:
pulse<space>*time*<space>*bound*<space>*low uniformity* <space>*high uniformity*<space>*window width*<space> *window step*<space> *window offset* <space>*wavelength* <space>*helix factor*<space>*RBS*<space>*IOR*<space> *distance range*<space>*acquisition offset*
where

<space>	character space
pulse	**Pulse** <pulse_index><set_flag>
time	**Time** <duration_of_acquisition(s)><set_flag>
bound	**Bound** <linearity_boundary (dB)> <set_flag>
low uniformity	**UnifLow** <minimum_slope (dB/km)> <set_flag>
high uniformity	**UnifHigh** <maximum_slope (dB/km)> <set_flag>
window width	**WindWidth** <window_width (m)> <set_flag>
window step	**WindStep** <analysis_step (m)><set_flag>
window offset	**WindOffset** <first_position_of_window (m)><set_flag>
wavelength	**Wave** <laser_index><set_flag>
helix factor	**Helix** <helix_factor (%)><set_flag>
RBS	**RBS** <RBS_factor (dB)><set_flag>
IOR	**IOR** <IOR_index><set_flag>
distance range	**Range** <range_index><set_flag>
acquisition offset	**Offset** <acquisition_offset><set_flag>

where
<pulse_index>, <set_flag>, <duration_of_ acquisition(s)>, <laser_index>, and <range_index> are integers,
and where
<linearity_boundary (dB)>, <minimum_slope (dB/km)>, <maximum_slope (dB/km)>, <analysis_step (m)>, <first_position_of_window (m)>, <helix_factor (%)>, <RBS_factor (dB)>, <IOR_index>, and <acquisition_offset> are float values in the ±9.99999E±999 format.

Example SENS4:POW:SET?

See also INF:MOD:FACT?, INIT, SENS:DIST:OFFS, SENS:DIST:RANG, SENS:FACT:HEL, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:PULS, SENS:POW:TIM:ACQ, and SENS:POW:WAV:SET

SENSitivity:POWer:TIMe:ACQuisition

Description This command is used to specify the duration of the acquisition and the operation mode (real-time or averaged).

Syntax SENS(0..26):POW:TIM:ACQ<space><time_value>

Parameters The <time_value> parameter is the duration of the aquisition in seconds: either 0 (real-time acquisition), or ≥ 5 (averaged acquisition).

Example SENS4:POW:TIM:ACQ 6

See also INF:MOD:FACT?, INIT, SENS:DIST:OFFS, SENS:DIST:RANG, SENS:FACT:HEL, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:PULS, and SENS:POW:WAV:SET

SENSitivity:POWer:WAVelength:SET

Description This command is used to specify the laser index for the acquisition.

Syntax SENS(0..26):POW:WAV:SET<space><wave>

Parameters The <wave> parameter is the laser index.

Note This command can be used only if a multi-wavelength laser is being used.

Example SENS4:POW:WAV:SET 1

See also INF:MOD:FACT?, INIT, SENS:DIST:OFFS, SENS:DIST:RANG, SENS:FACT:HEL, SENS:FACT:IOR, SENS:FACT:RBS, SENS:POW:PULS, and SENS:POW:TIM:ACQ

TRACe:ANAlysis:BIDirectional

Description This command is used to start a bidirectional analysis.

Syntax TRAC(0..26):ANA:BID<space><fileAB>,<fileBA>

Parameters The <fileAB> parameter is the file name of the trace AB.
The <fileBA> parameter is the file name of the trace BA.

Example TRAC4:ANA:BID \\machine_name\shared\directory\traceAB, \\machine_name\shared\directory\traceBA

See also TRAC:ANA:LIN and TRAC:ANA:UNI

TRACe:ANAlysis:LINearity

Description This command is used to perform a linearity analysis on a trace file.

Syntax TRAC(0..26):ANA:LIN[<space><filename>]

Parameters The optional <filename> parameter represents the file name of the trace.

Example TRAC4:ANA:LIN \\machine_name\shared\directory\tracename

See also TRAC:ANA:BID and TRAC:ANA:UNI

TRACe:ANAlysis:UNIdirectional

Description This command is used to start a unidirectional (end-to-end) analysis.

Syntax TRAC(0..26):ANA:UNI[<space><filename>]

Parameters The optional <filename> parameter is the file name of the trace.

Example TRAC4:ANA:UNI \\machine_name\shared\directory\tracename

See also TRAC:ANA:BID and TRAC:ANA:LIN

TRACe:ATTenuation?

Description This query returns the value of the measured attenuation.

Syntax TRAC(0..26):ATT?

Response A value representing the attenuation in the "±9.99999E±999" format.

Example TRAC4:ATT?

See also TRAC:LOSS:SPL?, TRAC:LOSS:TWOP?, TRAC:ORL?, and TRAC:REFL?

TRACe:DATa:MARKer:SET

Description This command is used to set the position of the marker on the trace.

Syntax TRAC(0..26):DAT:MARK:SET<space><marker><space><value>

Parameters The <marker> parameter represents the index of the marker ("A" for marker "a", "B" for marker "A", "C" for marker "B", or "D" for marker "b").

The <value> parameter represents the value on the "x" axis at which the marker is to be set (in meters).

Example TRAC4:DAT:MARK:SET A 300

See also TRAC:DAT:MARK:SET?

TRACe:DATa:MARKer:SET?

Description This query returns the gain at the position of the marker on the trace.

Syntax TRAC(0..26):DAT:MARK:SET?<space><marker>

Parameters The <marker> parameter represents the gain at the position of the marker ("B" for marker "A" or"C" for marker "B"), in the "±9.99999E±999" format.

Example TRAC4:DAT:MARK:SET? B

See also TRAC:DAT:MARK:SET

TRACe:LOSS:SPLice?

Description This query returns the measured loss value (in dB) at a given splice.

Syntax TRAC(0..26):LOSS:SPL?

Response A value representing the loss at the given splice in the "±9.99999E±999" format.

Example TRAC4:LOSS:SPL?

See also TRAC:ATT?, TRAC:LOSS:TWOP?, TRAC:ORL?, and TRAC:REFL?

TRACe:LOSS:TWOPoints?

Description This query returns the measured loss value (in dB) between two given markers.

Syntax TRAC(0..26):LOSS:TWOP?

Response A value representing the loss between two given markers in the "±9.99999E±999" format.

Example TRAC4:LOSS:TWOP?

See also TRAC:ATT?, TRAC:LOSS:SPL?, TRAC:ORL?, and TRAC:REFL?

TRACe:ORL?

Description This query returns the value of the measured optical return loss.

Syntax TRAC(0..26):ORL?

Response A value representing the measured ORL in the "±9.99999E±999" format.

Example TRAC4:ORL?

See also TRAC:ATT?, TRAC:LOSS:SPL?, TRAC:TWOP?, and TRAC:REFL?

TRACe:REFL?

Description This query returns the value of the measured reflectance.

Syntax TRAC(0..26):REFL?

Response A value representing the measured reflectance in the "±9.99999E±999" format.

Example TRAC4:REFL?

See also TRAC:ATT?, TRAC:LOSS:SPL?, TRAC:TWOP?, and TRAC:ORL?

IQ-9100 Switch Module Commands

PROGram[:SELected]:EXECute

Description This command initiates execution of the program currently loaded in the module's memory.

Syntax PROG(0..26)[:SEL]:EXEC

Example PROG4:SEL:EXEC

PROGram[:SELected]:NAME

Description This command loads a previously defined switch program into the module's memory. See the module instruction manual for information about creating a switching program.

Syntax PROG(0..26)[:SEL]:NAME<space><string>

Parameter The <string> parameter is the path and filename of the program to be loaded

Example PROG4:SEL:NAME C:\IQ\USERFILE\PROG1X4.PRG

Note This command will terminate any program that may be running.

PROGram[:SELected]:NAME?

Description This query returns the name and path of the currently loaded program.

Syntax PROG(0..26)[:SEL]:NAME?

Response Returns a string identifying the path and name of the program file in the "C:\IQ\USERFILE\PROG1X4.PRG" format.

Example PROG4:SEL:NAME?

PROGram[:SELected]:STATe

Description This command controls the program currently loaded in the module's memory.

Syntax PROG(0..26)[:SEL]:STAT<space><value>

Parameters The <value> parameter can be:
"0" or "RUN" -start the program
"1" or "PAUS" -pause the program
"2" or "STOP" -stop program execution
"3" or "CONT"-resume a paused program

Example PROG4:SEL:STAT RUN

PROGram[:SELected]:STATe?

Description This query returns a value indicating the current state of the loaded program.

Syntax PROG(0..26)[:SEL]:STAT?

Response
"STOPPED" -the program is stopped
"PAUSED" -the program is paused
"RUNNING" -the program is in progress

Example PROG4:SEL:STAT?

ROUTe:CLOSe

Description This command positions the optical switch to the reset position. In this position, there is no optical continuity.

Syntax ROUT(0..26):CLOS

Example ROUT4:CLOS

ROUTe:OPEN

Description This command makes the switch change from the reset position (no optical continuity) to the channel position in effect when the switch was closed.

Syntax ROUT(0..26):OPEN

Example ROUT4:OPEN

ROUTe:OPEN?

Description This query returns a value indicating whether the switch is optically open or closed.

Syntax ROUT(0..26):OPEN?

Response "1" -there is optical continuity
"0" -there is no optical continuity

Example ROUT4:OPEN?

ROUTe:PATH:CATalog?

Description This query returns a value indicating the type of switch in use (e.g. 1x2, 1x4, 1x12, 1x16, 1x32, or 2x2).

Syntax ROUT(0..26):PATH:CAT?

Response The response is in the "9 x 99" format.

Example ROUT4:PATH:CAT?

ROUTe:SCAN

Description This command sets the switch to a specific channel.

Syntax ROUT(0..26):SCAN<space><value>

Parameters The <value> parameter can be:

"1" to "32"	-depending on the switch configuration
"BYPASS"	-2x2 switch only
"INSERT"	-2x2 switch only

Example ROUT4:SCAN 4

ROUTe:SCAN?

Description This query returns a value indicating the current switch position.

Syntax ROUT(0..26):SCAN?

Response

"99"	-number 1 to 32 indicating the position
"1"	-in Bypass position (2x2 switch only)
"2"	-in Insert state (2x2 switch only)

Example ROUT4:SCAN?

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8 Quick Reference Command Trees

The following subsections contain quick reference tables illustrating the command tree for each of the IQ modules. See the detailed explanation of each command for more complete information.

IQ-200 Optical Test System Command Tree

Command	Parameter/ Response	Description
INST CAT?	(module, module, ...)	Get available modules
CAT FULL?	(module#, module, ...)	Get available modules with module address
STAT	<1|ON|0|OFF>,<0..26>	Open or close application
STAT?	<0..26> / (0|1)	Application active?
SHEL DATE	<YYYY>,<MM>,<DD>	Set system date
DATE?	(MM/DD/YY)	Get system date
LIGH	<1|ON|0|OFF>	Control front panel lights
LIGH?	(0|1)	Lights active?
TIME	<HH>,<MM>,<SS>	Set system time
TIME?	(HH:MM:SS)	Get system time

Table 8-1. IQ-200 Optical Test System Command Tree

IQ-Power Meter Series Command Tree

Command					Parameter/ Response	Description
ABOR					—	Stop measurements
FETC	[SCAL]	POW	DC?		(±999.999E±99)	Get stored value
FORM	READ	[DATA]		[a]	<0|1|2|3|4>	Set display resolution
INIT	CONT				<0|1>	Start continuous measurements
	CONT?				(0|1)	Measurements in progress?
	[IMM]				—	Store single measurement
INST	NSEL				<channel#>	Set channel number
MMEM	ACQ				<0|1>	Start/stop acquisition
	ACQ?				(0|1)	Acquisition in progress?
READ	[SCAL]	POW	DC?		(±999.999E±99)	Store and get value
			MODE		<0|1>	Set validation mode
			MODE?		(0|1)	Get validation mode

Table 8-2. *IQ-Power Meter Series Command Tree (Part 1 of 2)*

Command					Parameter/ Response	Description
SENS	AVER	[STAT]		a	<0|1>	Set data averaging
		STAT?			(0|1)	Averaging active?
	CORR	COLL	ZERO	a	<[ALL]>	Perform null measurement
		OFFS	[MAGN]		<99.999, ...> [DB]	Set offset value
	FREQ			a	<value> [HZ]	Set sampling rate
	FREQ?				(99.9)	Get sampling rate
	FREQ	CAT?			(99.9)	List sampling rates
	POW	REF?			(99.999) [DBM]	Get reference value
		REF	DISP	a	—	Set new reference
			STAT	a	<0|1>	Set absolute or relative
			STAT?		(0|1)	Get absolute or relative
		UNIT		a	<DBM|W|0|1>	Set power unit
		UNIT?			(0|1)	Get power unit
		WAV		a	<9999> [NM] <9999.9> [NM] for IQ-1500	Set wavelength
		WAV?			(9999) [NM] (9999.9) [NM] for IQ-1500	Get wavelength
UNIT	POW			a	<0|1|2|DB|DBM|W>	Set display unit

Table 8-2. *IQ-Power Meter Series Command Tree (Part 2 of 2)*

a. Not executed if a data acquisition is in progress ("Acquisition already running" message is returned).

IQ-1600 High-Speed Power Meter Command Tree

Command				Parameter/ Response	Description
ABOR				—	Stop measurements
FETC	[SCAL] POW	DC?		(±999.9999E±99)	Get stored value
FORM	READ [DATA]		a	<0|1|2|3|4|5>	Set display resolution
INIT	AUTO		a	<0|1>[,<CONT|NCON|0|1>	Start/stop programmed acquisition
	AUTO?			(0|1)	Programmed acquisition in progress?
	CONT			<0|1>	Start/stop measurements
	CONT?			(0|1)	Measurements in progress?
	EXTR		a	<0|1>	Start/stop Min/Max measurements in Continuous mode
	EXTR?			(0|1)	Min/Max measurements in progress in Continuous mode?
	[IMM]			—	Store single measurement

Table 8-3. *IQ-1600 Quick Reference Command Tree (Part 1 of 5)*

Command				Parameter/ Response	Description
INST	NSEL		a	<channel#>	Set active channel
	NSEL?			(channel#)	Get active channel
MEAS	[SCAL] POW	MAX?		(±999.9999E±99)	Get Max. in Continuous mode
		MIN?		(±999.9999E±99)	Get Min. in Continuous mode
MMEM	ACQ			<0|1>[,CONT|NCON|0|1]	Start/stop file acquisition
	ACQ?			(0|1)	File acquisition in progress?
	ACQ DURA			<9999>,<99>,<99>	Set duration of file acquisition
	DURA?			(9999),(99),(99)	Get duration of file acquisition
READ	[SCAL] POW	DC?		(±999.9999E±99)	Store and get value
SENS	AVER COUN		a	<999>	Set number for data averaging
	COUN?			(999)	Get number for data averaging

Table 8-3. *IQ-1600 Quick Reference Command Tree (Part 2 of 5)*

Command					Parameter/ Response	Description
SENS	AVER	[STAT]		a	<0|1>	Activate/deactivate data averaging
		STAT?			(0|1)	Data averaging active?
	CORR	COLL	ZERO	a	[<ALL>]	Perform null measurement
		OFFS	[MAGN]	a	<-10.0 to +6.989 dB>] <0.1 to 5.0 W/W>]	Set correction factor
	FREQ	[CONT]		a	<value> [HZ]	Set continuous acquisition rate
		CONT?			(999.999)	Get continuous acquisition rate
		[CONT]	CAT?		(999.999;999.999;...)	List continuous acquisition rates
		NCON		a	<value> [HZ]	Set single acquisition rate
		NCON?			(9999.9)	Get single acquisition rate
		NCON	CAT?		(9999.9;9999.9;...)	List single acquisition rates
	POW	RANG?			(±xx.xx to ±xx.xx dBm) (+999.99E±999 to +999.99E±999 W)	Get range
		RANG	AUTO	a	<0|1>	Activate/deactivate Autorange

Table 8-3. *IQ-1600 Quick Reference Command Tree (Part 3 of 5)*

Command					Parameter/ Response	Description
SENS	POW	RANG	AUTO?		(0|1)	Autorange active?
			HIGH	a	<1|2|3|4>	Set manual high range
			LIST?		(±xx.xx to ±xx.xxdBm) (+999.99E±999 to +999.99E±999 W)	List ranges
			LOW	a	<1|2|3|4|5|6>	Set manual low range
		REF		a	<999.9999 dBm> <+9.9999E-999 W>	Set user reference
		REF?			(999.9999 dBm) (+9.9999E-999 W)	Get reference
		REF	DISP	a	—	Set new reference
			STAT	a	<0|1>	Set absolute or relative
			STAT?		(0|1)	Get absolute or relative
		UNIT		a	<DBM|W|0|1>	Set power unit
		UNIT?			(0|1)	Get power unit
		WAV		a	<value> [NM]	Set wavelength
		WAV?			(9999.99) NM	Get wavelength
TRAC	DATA?				(±999.9999E±99; ±999.9999E±99;...)	Get programmed acquisition measurements
	MAX?			a	(±999.9999E±99)	Get Max. in Single mode
	MIN?			a	(±999.9999E±99)	Get Min. in Single mode

Table 8-3. *IQ-1600 Quick Reference Command Tree (Part 4 of 5)*

Command				Parameter/ Response	Description
TRAC	POIN			<99999>[,ALL]	Set number of points
	POIN?			(99999)	Get number of points
TRIG	POS			<99|TRIG_POSx>	Set trigger position
	POS?			(99)	Get trigger position
	POS	CAT?		(99;99;99;...)	Get list of trigger positions
	SEQ	LEV	a	<+999.9999E+99> [DBM|W]	Set trigger level
		LEV?		(+999.9999E+99)	Get trigger level
		SLOP	a	<POS|NEG>	Set trigger edge
		SLOP?		(POSITIVE|NEGATIVE)	Get trigger edge
		SOUR	a	<EXT|INT1|2|3|4>	Set trigger source
		SOUR?		(EXTERNAL| INTERNAL1|2|3|4)	Get trigger source
		STAT		<0|1>	Activate/deactivate trigger
		STAT?		(0|1)	Trigger active?
UNIT	POW			<0|1|2|3|DB|DBM| W|W/W>	Set display unit

Table 8-3. *IQ-1600 Quick Reference Command Tree (Part 5 of 5)*

a. These commands are not executed if a data acquisition is in progress. The "Acquisition already running" message will be returned.

IQ-2100 Light Source Command Tree

Command			Parameter/ Response	Description
SOUR AM	[INT]	FREQ	<value>[HZ|KHZ]|CW|0]	Set internal modulation
		FREQ?	(9999)	Get internal modulation
POW ATT			<value>[0..10][DB]	Set attenuation
ATT?			(99.9)	Get attenuation
STAT			<1|0|ON|OFF>	Turn source on or off
STAT?			(0|1)	Source active?
WAV			<UPP|LOW|DUAL>	Set wavelength
WAV?			(9999)	Get wavelength
WAV	COUN?		(1|2)	Get number of available sources
	DUAL?		(0|1)	Source hybrid?

Table 8-4. IQ-2100 Light Source Command Tree

IQ-2300 ASE Laser Source Command Tree

Command	Parameter/ Response	Description
SOUR POW ATT	<9.9>	Set attenuation
ATT?	(9.9)	Get attenuation
STAT	<0|1>	Turn source on or off
STAT?	(0|1)	Source active?
PROT HARE?	(0|1)	Interlock connector present?
HARS?	(0|1)	Interlock connector open?
RPWD	—	Remove password
SPWD	<string>	Enter password
SOFE?	(0|1)	Software key present?
SOFS?	(0|1)	Software key activated?

Table 8-5. IQ-2300 ASE Laser Source Command Tree

IQ-2400 WDM Laser Source Command Tree

Command	Parameter/ Response	Description
CAL RES?	(9999.999E±999)	Get calibration value
VAL	<9.999E±999>	Set calibration value
INP CHAN?	(99)	Get channel
OUTP SOUR ACCO	<9999.99> <±99.99>	Set delta temp. and delta current
APCO	<±9.999E+9> <±9.999E+9>	Set wavelength or frequency and power
MODE	<APC|ACC| APCDITHER| ACCONOFF|0|1|2|3>	Set operation mode
MODE?	(0|1|2|3|)	Get operation mode
SETP	<setpoint name>, <0|1|APC|ACC>	Set module setpoint
STAT	<OFF|ON|0|1>	Turn source on or off
STAT?	(0|1)	Source active?
STAB?	(0|1)	Source stable?
STAT?	(00|01|11..14|21..29| 91|92|94|95|98|99)	Get source state

Table 8-6. *IQ-2400 WDM Laser Source Command Tree (Part 1 of 4)*

Command			Parameter/ Response	Description
SOUR CURR	ACCB		<+9.999E+9>	Set ACC base current
	ACCB?		(9999.999E±9)	Get ACC base current
	CHAN?		(9999.999E±9)	Get channel current
	CHBA?		(9999.999E±9)	Get channel base current
	LEV?		(9999.999E±9)	Get channel delta current
	LIM	HIGH?	(+9999.999E±9)	Get max. delta current
		LOW?	(-9999.999E±9)	Get min. delta current
		STEP?	(9999.999E±9)	Get min. current step
POW	CHAN?		(9999.999E±9)	Get output power
	LEV?		(9999.999E±9)	Get delta output power
	LIM	HIGH?	(9999.999E±9)	Get max. power
		LOW?	(±9999.999E±9)	Get min. power
		STEP?	(9999.999E±9)	Get min. power step
PULM	INT	DEPT	<±9.999E+9>	Set signal depth
		DEPT?	(9999.999E+9)	Get signal depth
		FREQ	<9.999E+9>	Set signal frequency
		FREQ?	(999999.9)	Get signal frequency
		SHAP	<0|1>	Set signal shape
		SHAP?	(0|1)	Get signal shape

Table 8-6. *IQ-2400 WDM Laser Source Command Tree (Part 2 of 4)*

Command				Parameter/ Response	Description
SOUR PUL	LIM	DEPT	HIGH?	(9999.999E±9)	Get signal max. depth
			LOW?	(9999.999E±9)	Get signal min. depth
			STEP?	(9999.999E±9)	Get signal min. step
		FREQ	DMAX?	<999999>	Get max. frequency in Dither mode
			DMIN?	(999999)	Get min. frequency in Dither mode
			HIGH?	<9> / (999999.9)	Get range maximum frequency
			LOW?	<9> / (999999.9)	Get range minimum frequency
			OMAX?	(999999)	Get max. frequency in OnOff mode
			OMIN?	(999999)	Get min. frequency in OnOff mode
			RANG?	(9)	Get number of frequency ranges
			STEP?	<9> / (999999.9)	Get range min. step
	SOUR			<0|1|INT|EXT>	Set signal source
	SOUR?			(0|1)	Get signal source
TEMP	CHAN?			(±99.99)	Get channel temperature
	LEV?			(±99.99)	Get channel delta temperature

Table 8-6. *IQ-2400 WDM Laser Source Command Tree (Part 3 of 4)*

Command				Parameter/ Response	Description
SOUR	TEMP	LIM	HIGH?	(+99.99)	Get max. delta temp.
			LOW?	(-99.99)	Get min. delta temp.
			STEP?	(99.99)	Get temperature minimum step
	WAV	CHAN?		(9999.99) [NM] (999.999) [THZ]	Get calibrated channel wavelength or frequency
		LEV?		(9999.99) [NM] (999.999) [THZ]	Get channel wavelength or frequency
		LIM	HIGH?	(9999.99) [NM] (999.999) [THZ]	Get max. wavelength or min. frequency
			LOW?	(9999.99) [NM] (999.999) [THZ]	Get min. wavelength or max. frequency
			STEP?	(9999.99) [NM] (999.999) [THZ]	Get wavelength minimum step
UNIT	POW			<W|DB|1|0>	Set power unit
	WAV			<THZ|NM|1|0>	Set spectral unit

Table 8-6. *IQ-2400 WDM Laser Source Command Tree (Part 4 of 4)*

IQ-2600 Tunable Laser Source Command Tree

Command					Parameter/ Response	Description
OUTP	ASE?				(0|1)	Source available?
	MODE				<0|1>	Set source mode
	MODE?				(0|1)	Get source mode
	STAT				<0|1>	Turn source on or off
	STAT?				(0|1)	Source active?
PROG	SEL	NAME			<string>	Load program
		NAME?			(string)	Get program name and path
		STAT			<0|1|2|3|RUN|PAUS|STOP|CONT>	Control program
		STAT?			(STOP|PAUSE|RUNNING|WAITING)	Get program state
SOUR	POW	LEV	IMM	AMPL	<±99.9>	Set source power
				AMPL?	(±99.9)	Get source power
		LIM	HIGH?		(±99.9)	Get max. output power
			LOW?		(±99.9)	Get min. output power
			STEP?		(±99.9)	Get min. power step

Table 8-7. IQ-2600 Tunable Laser Source Command Tree (Part 1 of 3)

Command				Parameter/ Response	Description
SOUR	SWE	CENT?		(9999.99) [NM] (999.999) [THZ]	Get center wavelength
		COUN		<999>	Set repetitions
		COUN?		(999)	Get repetitions
		PROG?		(9999.99;99.99; 999:99:99) [NM] (999.999;9.999; 9999:99:99) [THZ]	Set sweep parameters
		REP		<0|1>	Set loop
		REP?		(0|1)	Loop active?
		REV		<0|1>	Set reverse function
		REV?		(0|1)	Reverse function active?
		SPAN?		(9999.99) [NM] (999.999) [THZ]	Get wavelength span
		STAT		<0|1>	Turn sweep on or off
		STAT?		(0|1)	Sweep active?
		TIME?		(9999:99:99)	Get sweep duration
	WAV	LENG		<9999.99> [NM] <999.999> [THZ]	Set wavelength
		LENG?		(9999.99) [NM] (999.999) [THZ]	Get wavelength
		LIM	HIGH?	<9999.99> [NM] <999.999> [THZ]	Get max. wavelength

Table 8-7. *IQ-2600 Tunable Laser Source Command Tree (Part 2 of 3)*

Command				Parameter/ Response	Description
SOUR	WAV	LIM	LOW?	<9999.99> [NM] <999.999> [THZ]	Get min. wavelength
			STEP?	<9999.99> [NM] <999.999> [THZ]	Get min. wavelength step
UNIT	WAV			<0|1>	Set wavelength unit
	WAV?			(0|1)	Get wavelength unit

Table 8-7. *IQ-2600 Tunable Laser Source Command Tree (Part 3 of 3)*

IQ-3100/3300 Variable Attenuator/Reflector Command Tree

Command				Parameter/ Response	Description
INP	ARES?		a	(-9.999)	Get max. resolution
	ATT		b, c	<99.999 [DB]|MIN|MAX>	Set attenuation
	ATT?			(±999.999)	Get attenuation
	OFFS		b	<±999.999> [DB]	Set offset value
	OFFS?			(±999.999)	Get offset value
	OFFS	DISP	b	—	Set offset to display
	WAV		b, c	<9999.9> [NM]	Set wavelength
	WAV?			(9999.9)	Get wavelength
OUTP	APM		b	<OFF|ON|0|1>	Set absolute or relative
	APM?			(0|1)	Get absolute display
	[STAT]		b, d	<OFF|ON|0|1>	Activate shutter
	[STAT]?			(0|1)	Get shutter status
PROG	PROG	NAME		<string>	Load program
		NAME?		(string)	Get program name and path

Table 8-8. *IQ-3100/3300 Variable Attenuator/Reflector Command Tree (Part 1 of 2)*

Command		Parameter/ Response	Description
PROG SEL	STAT	<0..3|RUN|PAUS|STOP|CONT>	Control program
	STAT?	(STOPPED|PAUSED|RUNNING)	Get program state

Table 8-8. *IQ-3100/3300 Variable Attenuator/Reflector Command Tree (Part 2 of 2)*

a. Command developed for high level applications.
b. Commands ignored when a program is running.
c. Valid parameters are determined by the type of module.
d. The file name must include the drive and the complete path.

IQ-3200 ORL Meter Command Tree

Command			Parameter/ Response	Description
ABOR			—	Stop measurements
FETC?			(-999.999)	Get stored value
FORM	READ	DATA	<0|1|2|3|4>	Set display resolution
		DATA?	(0|1|2|3|4)	Get display resolution
INIT	CONT		<ON|OFF|1|0>	Start/stop measurements
	CONT?		(1|0)	Measurements started?
	[IMM]		—	Store single value
INP	OFFS		<±999.999> [DB]	Set offset value
READ	POW?		(±999.999)	Store and get value
SENS	AVER	STAT	<ON|OFF|1|0>	Set data averaging
		STAT?	(0|1)	Data averaging active?

Table 8-9. IQ-3200 ORL Meter Command Tree (Part 1 of 2)

Command	Parameter/ Response	Description
SENS CORR COLL ZERO	—	Perform null measurement
FREQ *	<value> [HZ]	Set sampling rate
FREQ?	(9.9)	Get sampling rate
FREQ CAT?	(9.9)	List sampling rates
POW RANG [LOW]?	(-999.9)	Get min. reflection
POW REF	<±99.999|EXFO [DB|%]>	Perform ORL calibration
REFL	—	Perform ORL zero measurement
WAV?	(9999)	Get wavelength
WAV LIST?	(9999 - 9999)	Get programmed wavelengths
PROG	<1|2,9999> [NM]	Program wavelength
SET	<9999> [NM]	Set wavelength

Table 8-9. *IQ-3200 ORL Meter Command Tree (Part 2 of 2)*

IQ-3400 PDL/OL Meter Command Tree

Command	Parameter/ Response	Description
ABOR	—	Stop measurements
DISP CPL	—	Enable CPL
DUT	—	Enable DUT
ORL	—	Enable ORL
FETC [SCAL] POW DC?	<±999.999>	Get ORL measurement
FORM READ DATA	<0|1|2|3|4>	Set resolution
DATA?	(0|1|2|3|4)	Get resolution
INIT CONT	<0|1>	Set Continuous mode
CONT?	(0|1)	Continuous mode activated?
[IMM]	—	Store single measurement
INP OFFS	<±99.999>	Set offset value
OFFS?	(±99.999)	Get offset value

Table 8-10. *IQ-3400 PDL/OL Meter Command Tree (Part 1 of 3)*

Command	Parameter/ Response	Description
MMEM ACQ	<0|1>	Start/stop acquisition
ACQ?	(0|1)	Acquisition in progress?
READ POW?	(±999.999)	Store and get measurement
SENS AVER STAT	<0|1>	Activate/deactivate data averaging
STAT?	(0|1)	Averaging activated?
CORR COLL ZERO	—	Perform offset nulling
POW CAL	<0|1>	Start calibration
COUN	<9999>	Set number of scans
COUN?	(9999)	Get number of scans
PER	<9999>	Set period
PER?	(9999)	Get period
RANG LOW?	-999.9	Get minimum reflection
REF	<±99.999|EXFO>[DB|%]	Perform reference calibration
REFL	—	Perform zero measurement
WAV	<9999>	Set wavelength

Table 8-10. *IQ-3400 PDL/OL Meter Command Tree (Part 2 of 3)*

Command				Parameter/ Response	Description
SENS	POW	WAV?		(9999)	Get current wavelength
		WAV	LIST?	(9999), (9999)	Get wavelength list
			PROG	<0|1,9999>	Program wavelengths
			SET	<9999>	Set new wavelength
UNIT	POW			<2|3>	Set power unit
	POW?			(2|3)	Get power unit

Table 8-10. *IQ-3400 PDL/OL Meter Command Tree (Part 3 of 3)*

IQ-5100 Polarization Controller Command Tree

Command	Parameter/ Response	Description
INIT SCAN	<1|0>	Start/stop random scanning
SCAN?	(1|0)	Random scanning in progress?
INP CELL VOLT	<1|2|3|4>,<value> [V]	Set voltage
VOLT?	(99.999), (99.999), (99.999), (99.999)	Get voltage
INST PER	<99.9>	Set scan period
PER?	(99.9)	Get scan period
WAV	<9999>	Set wavelength
WAV?	(9999)	Get wavelength

Table 8-11. IQ-5100 Polarization Controller Command Tree

IQ-5200 OSA Command Tree

Command			Parameter/ Response	Description
ABOR			—	Stop an acquisition
CALC	ADB		—	Calculate R = A/B
	AMB		—	Calculate R = A - B
	AMC		—	Calculate R = A x B
	APC		—	Calculate R = A + C
	CHAN	BAND?	<1..320>/(999.999)	Get bandwidth
		CENT?	<1..320>/(999.999)	Get center wavelength or frequency
		CLIM	<9999.999>, <9999.999>, [999]	Add/modify channel
		COUN?	(999)	Get number of channels
		DELE	<1..320|ALL>	Delete channel
		LEFT?	<1..320>/(9999.999)	Get left limit
		LRLI	<9999.999>, <9999.999>, [999]	Add/modify channel
		RIGH?	<1..320>/(9999.999)	Get right limit
	CNS		<YES|NO|1|0>	Activate/deactivate recalculation

Table 8-12. IQ-5200 OSA Command Tree (Part 1 of 7)

Command	Parameter/ Response	Description
CALC CNS?	(YES|NO)	Trace updated?
DFB	<99.99>	Perform DFB analysis
DFB?	(9999.999), (±99.99), (99.999), (±99.99), (99.999), (99.999), (99.999)	Get DFB results
EDFA	—	Perform EDFA analysis
EDFA?	<1..320>/(999), (9999.999), (±99.99), (99.99), (99.99), (99.99), (99.99), (99.99)	Get EDFA results
EDFA COUN?	(1..320)	Get number of EDFA results
PEAK	—	Detect peak on trace A
PEAK?	<1..320>/(9999.999), (SATURATED: TRUE|FALSE)	Get information on peak
PEAK COUN?	(1..320)	Get number of peaks on trace A
WDM	<99.99>	Perform WDM analysis
WDM?	<1..320>/(999), (9999.999), (±99.99), (99.99), (99.99), (99.99), (99.99), (99.99)	Get WDM results

Table 8-12. IQ-5200 OSA Command Tree (Part 2 of 7)

Command			Parameter/ Response	Description
CALC	WDM	COUN?	(1..320)	Get number of WDM results
INFO	DUT	COMM	<string>	Set comments on DUT
		COMM?	(string)	Get comments on DUT
		HUM	<999.9>	Set DUT humidity value
		HUM?	(999.9)	Get DUT humidity value
		ID	<string>	Set DUT ID
		ID?	(string)	Get DUT ID
		NAME	<string>	Set DUT name
		NAME?	(string)	Get DUT name
		SN	<string>	Set DUT serial number
		SN?	(string)	Get DUT serial number
		TEMP	<±99999.99>	Set temperature
		TEMP?	(±99999.99)	Get temperature
	GEN	ADDR	<string>	Set organization address

Table 8-12. IQ-5200 OSA Command Tree (Part 3 of 7)

Command			Parameter/ Response	Description
INFO	GEN	ADDR?	(string)	Get organization address
		DIV	<string>	Set division
		DIV?	(string)	Get division
		ORG	<string>	Set organization name
		ORG?	(string)	Get organization name
		TITL	<string>	Set operator's title
		TITL?	(string)	Get operator's title
		USER	<string>	Set operator's name
		USER?	(string)	Get operator's name
	TRAC?		(YYYY-MM-DD HH:MM), (999), (CHAR15), (CHAR15), (+99.99), (9999.999), (+99.99), (99.99), (CHAR70), (9.9C)	Get information on active trace
INIT	AUTO		—	Start auto-stop acquisition
	CONT		—	Start continuous acquisition
	MODE		<SNGLS|CONTS|AUTOS|REALT>	Set acquisition mode

Table 8-12. *IQ-5200 OSA Command Tree (Part 4 of 7)*

Command			Parameter/ Response	Description
INIT	MODE?		(SNGLS|CONTS|AUTOS|REALT)	Get acquisition mode
	REAL		—	Start real-time acquisition
	[SCAN]		—	Start acquisition in current mode
	SCAN?		(0|1)	Acquisition is progress?
	SING		—	Start single acquisition
INP	OFFS	ACT	<YES|NO|1|0>	Activate/deactivate offset
		ACT?	(YES|NO)	Offset activated?
		POW	<±99.99>	Set power offset value
		POW?	(±99.99)	Get power offset value
		WAV	<±99.999>	Set wavelength offset value
		WAV?	(±99.999)	Get wavelength offset value
	THR	ACT	<YES|NO|1|0>	Activate/deactivate threshold
		ACT?	(YES|NO)	Threshold activated?

Table 8-12. *IQ-5200 OSA Command Tree (Part 5 of 7)*

Command	Parameter/ Response	Description
INP THR POW	<±99.99>	Set power threshold value
POW?	(±99.99)	Get power threshold value
SN	<99.99>	Set SNR threshold value
SN?	(99.99)	Get SNR threshold value
INST SWAP	—	Swap traces A and B
MMEM LOAD CHAN	—	Get channel list
CONF	—	Get configuration
TRAC	—	Get trace
SAVE CHAN	—	Save channel
CONF	—	Save configuration
TRAC	—	Save trace
SENS AVER COUN	<99>	Set number of scans for averaging
COUN?	(99)	Get number of scans for scanning
POW RANG	<9>	Set power sensitivity

Table 8-12. *IQ-5200 OSA Command Tree (Part 6 of 7)*

Command			Parameter/ Response	Description
SENS	POW	RANG?	(9)	Get power sensitivity
TRAC	CLEA		<A|B|R|ALL>	Close active trace(s)
	DATA?		<A|B|R>/(±99.99), ... (±99.99)	Get trace power values
	DATA	PRE?	<A|B|R>/(9999), (9999.9999), (9999.9999)	Get information on trace
		VAL?	<A|B|R>, <9999.999>, <NM|THZ>/(±99.99)	Get power value on x-axis
	POIN?		<A|B|R>/(9999)	Get number of points in trace
UNIT	FREQ		<NM|THZ>	Switch between nm and THz on x-axis
	FREQ?		(NM|THZ)	Get x-axis measurement units
	POW		<DBM|W>	Switch between dBm and mW power units
	POW?		(DBM|W)	Get measurement units

Table 8-12. *IQ-5200 OSA Command Tree (Part 7 of 7)*

IQ-5310 Wavelength Meter Command Tree

Command	Parameter/ Response	Description
ABOR	—	Stop storing values
FETC [SCAL] POW DC?	(±999.999)	Get stored power value
WAV?	(9999.999) [NM] (999.9999) [THZ]	Get stored wavelength or frequency value
FORM READ [DATA]	<0|1>	Set resolution mode
INIT CONT	<1|0>	Activate/deactivate automatic value storage
CONT?	(0|1)	Automatic value storage activated?
IMM	—	Store current values
MMEM ACQ	<1|0>	Start/stop storing acquisitions
ACQ?	(0|1)	Acquisitions stored?
FREQ	<value> [HZ]	Set acquisition period

Table 8-13. IQ-5310 Wavelength Meter Command Tree (Part 1 of 4)

Command				Parameter/ Response	Description
MMEM	FREQ?			(2|1|0.99999)	Get acquisition period
READ	[SCAL]	POW	DC?	(±999.999)	Get power value
			WAV?	(9999.999) [NM] (999.9999) [THZ]	Get wavelength or frequency value
SENS	AVER	STAT		<0|1>	Set data averaging
		STAT?		(0|1)	Averaging active?
		USER		<value>	Set number of scans
		USER?		(999)	Get number of scans
	CORR	CAL		—	Perform wavelength calibration
		MED		<AIR|VAC|0|1>	Set medium
		MED?		(0|1)	Get current medium
		OFFS	FREQ	<value>[THZ]	Set frequency offset
			FREQ?	(99.99)	Get frequency offset
			MAGN	<value>[DB]	Set power offset
			MAGN?	(99.99)	Get power offset
			WAV	<value>[NM]	Set wavelength offset
			WAV?	(99.99)	Get wavelength offset
		TEMP		<value>	Set temperature

Table 8-13. *IQ-5310 Wavelength Meter Command Tree (Part 2 of 4)*

Command				Parameter/ Response	Description
SENS	CORR	ZERO		—	Perform null measurement
	POW	REF?		(±99.99)	Get reference power
		REF	DISP	—	Make current power value the reference
			OFF	—	Revert power value to Absolute mode
			USER	<±99.99> [DBM|W]	Store specific reference value
		UNIT		<W|DBM|0|1>	Set power unit
		UNIT?		(0|1)	Get power unit
	WAV	RAN?		(9999 9999)	Get wavelength range
		REF?		(9999.999) [NM] (999.9999) [THZ]	Get reference wavelength or frequency
		REF	DISP	—	Make current wavelength or frequency the reference
			OFF	—	Revert wavelength or frequency to Absolute mode
SENS	WAV	REF	USER	<9999.9999> [NM|THZ]	Store a specific reference wavelength or frequency

Table 8-13. *IQ-5310 Wavelength Meter Command Tree (Part 3 of 4)*

Command			Parameter/ Response	Description
SENS	WAV	UNIT	<NM|THZ|0|1>	Switch between wavelength and frequency
		UNIT?	(0|1)	Wavelength or frequency?
UNIT	POW		<W|DBM|0|1>	Set power unit
	WAV		<NM|THZ|0|1>	Switch between wavelength and frequency

Table 8-13. *IQ-5310 Wavelength Meter Command Tree (Part 4 of 4)*

IQ-5320 Multi-Wavelength Meter Command Tree

Command			Parameter/ Response	Description
CALC	COUN?		(999)	Get number of results
	PEAK?		<1..320>/(999.9999|9999.999, 9.999E-999|±99.99)	Get information on peak
INIT	ACQ	STAT?	(0|1)	Acquisition ready?
	AUTO		<YES|NO|1|0>	Start custom acquisition
	CONT		<YES|NO|1|0>	Start continuous acquisition
	REAL		<YES|NO|1|0>	Start real-time acquisition
	SCAN?		(0|1)	Acquisition in progress?
	SING		<YES|NO|1|0>	Start auto acquisition
INP	OFFS	POW	<±9.99>	Set power offset
		POW?	(±9.99)	Get power offset
	THR	POW	<±99.99>	Set detection threshold

Table 8-14. *IQ-5320 Multi-Wavelength Meter Command Tree (Part 1 of 3)*

Command				Parameter/ Response	Description
INP	THR	POW?		(±99.99)	Get detection threshold
MMEM	SAVE	TRAC		<file,0|1>	Save trace
SENS	AVER	COUN		<99>	Set number of scans for averaging
		COUNT?		(99)	Get number of scans for averaging
	CORR	COLL	ZERO	—	Perform null measurement
		MED		<AIR|VAC|0|1>	Set medium
		MED?		(0|1)	Get current medium
		OFFS	MAGN	<±99.99>	Set power offset
			MAGN?	(±99.99)	Get power offset
		TEMP		<99.9> max. 55.0	Set temperature
		TEMP?		(99.9) max. 55.0	Get temperature
	FREQ	RAN?		(-99.99|9.999E-999, -99.99|9.999E-999)	Get frequency range
	POW	RANG?		(-99.99, -99.99)	Get power range
	WAV	RANG?		(9999.999, 9999.999)	Get wavelength range

Table 8-14. *IQ-5320 Multi-Wavelength Meter Command Tree (Part 2 of 3)*

Command			Parameter/ Response	Description
TRAC	DATA?		(9.999E-999, 9.999E-999, 9.999E-999,...) or (±99.99, ±99.99, ±99.99...)	Get points on trace
	DATA	PRE?	(9999, 9999.9999, 9999.9999, 9.999E-999)	Get information on trace
		VALU?	(999.9999|9999.999) (9.999E-999|±99.99)	Get power of x-axis point
	POIN?		(9999)	Get number of points
UNIT	FREQ		<NM|THZ|0|1>	Set spectral unit
	FREQ?		(0|1)	Get spectral unit
	POW		<W|DBM|0|1>	Set power unit
	POW?		(0|1)	Get power unit

Table 8-14. *IQ-5320 Multi-Wavelength Meter Command Tree (Part 3 of 3)*

IQ-5500 PMD Analyzer Command Tree

Command		Parameter/ Response	Description
ABOR		—	Stop measurement
DISP	FIT	<0|1>	Set Gaussian display
	FIT?	(0|1)	Get display state
	MARK	<0|1>	Set markers
	MARK?	(0|1)	Get marker state
	SCAL	<0|1>	Set sensitivity scale
	SCAL?	(0|1)	Get sensitivity scale state
FETC?		(99.999,99.999)	Get delay and coefficient values
FETC	SENS?	(9.999) max. 5.000	Get current power
	STAT?	(TRUE|FALSE)	Get trace validity
INIT	CONT	<0|1>	Start acquisitions
	CONT?	(0|1)	Acquisitions in progress?
	[IMM]	—	Start single measurement

Table 8-15. *IQ-5500 PMD Analyzer Command Tree (Part 1 of 3)*

Command				Parameter/ Response	Description
INST	CAT?			[SRC],[9]	Get list of sources
	[SEL]			<99>,[SRC],[9]	Set source
	SEL?			[SRC],[9]	Get current source
MEM	CLEA			—	Clear Selection page
	DATA			<field>,<data>	Set entries in DUT, Comment 1, and Comment 2 fields
	DATA?			<field>/(data)	Get entries in DUT, Comment 1, and Comment 2 fields
	DEL			—	Erase current trace
	FILE			<file>	Set trace file name
	FILE?			(file)	Get trace file name
	LEN			<9999.999>	Set fiber length
	LEN?			(9999.999)	Get fiber length
	TABL	CURR	DATA?	(±99.999,99.999)	Get trace data in tabular form
			MAGN POIN?	(9999)	Get number of acquisition points
	TYPE			<STRONG|WEAK|COMPONENT>	Set fiber type

Table 8-15. *IQ-5500 PMD Analyzer Command Tree (Part 2 of 3)*

Command	Parameter/ Response	Description
MEM TYPE?	(STRONG|WEAK| COMPONENT)	Get fiber type
USER	<name>	Set operator's name
USER?	(name)	Get operator's name
SENS POW COUN	<9999>	Set number of scans
COUN?	(9999)	Get number of scans
DEL	<99999> max. 86399	Set time delay between scans
DEL?	(99999)	Get time delay between scans
MODE?	(PMD|FAST|ERPMD| AUTOPMD)	Get scan mode
RANG	<9>,[PMD|FAST| ERPMD|AUTOPMD]	Set power range
RANG?	(9)	Get power range
RANG LIST?	[PMD|FAST|ERPMD| AUTOPMD] / (1:0.1 to 1.0, etc.)	Get range list
WAV	<9999>[NM]	Set wavelength
WAV?	(9999)	Get wavelength

Table 8-15. *IQ-5500 PMD Analyzer Command Tree (Part 3 of 3)*

IQ-6100 EDFA Command Tree

Command	Parameter/ Response	Description
AMPL PROT HARE	(0|1)	Interlock connector present?
HARS?	(0|1)	Interlock connector open?
RPWD	—	Remove password
SPWD	<string>	Enter password
SOFE?	(0|1)	Software key present?
SOFS?	(0|1)	Software key activated?
STA	<0|1>	Turn source on or off
STA?	(0|1)	Source active?

Table 8-16. *IQ-6100 EDFA Command Tree*

IQ-7000 OTDR Command Tree

Command				Parameter/ Response	Description
ABOR				—	Stop measurements
DIAG	DEB			—	Perform self-test
INF	CABL	ID		<string>	Set cable ID
		MAN		<string>	Set manufacturer's name
		TYP		<string>	Set cable type
	FIB	ID		<string>	Set fiber ID
	GEN	CONT		<string>	Set contractor's name
		CUST		<string>	Set customer's name
		JOB		<string>	Set job ID
		REAS		<string>	Set reason for job
	HELP?			(string)	Get commands, parameters, and descriptions
	LOC	APO	NAM	<string>	Set point A
			OPER	<string>	Set operator's name at point A
		BPO	NAM	<string>	Set point B

Table 8-17. IQ-7000 OTDR Quick Reference Command Tree (Part 1 of 4)

Command				Parameter/ Response	Description
INF	LOC	BPO	OPER	<string>	Set operator's name at point B
	MOD	FACT?		(string)	Get number of lasers, valid ranges, pulses, PIID, and ID info
		ID?		(string)	Get OTDR type and model
		PII?		(string)	Get OTDR info
	TRAC			<string>	Set comment on trace
INIT				—	Start acquisition
MEM	IMP?			—	Get trace in memory
MMEM	IMP?			<filename>	Get trace file
	SAV	FORM		<format>	Set save format
		TRAC		<filename>	Save trace
PRIN				[filename]	Print trace
SENS	DIST	OFFS		<value>	Set acquisition offset
		RANG		<value>	Set acquisition range

Table 8-17. *IQ-7000 OTDR Quick Reference Command Tree (Part 2 of 4)*

Command					Parameter/ Response	Description
SENS	FACT	HEL			<99.99>	Set helix factor in %
		IOR			<9.999>	Set index of refraction
		RBS			<value>	Set Rayleigh back-scattering factor
	POW	INIT			—	Initialize OTDR module
		LIN	BOUN		<value>	Set linearity boundary
			UNI	HIGH	<value>	Set max. attenuation
				LOW	<value>	Set min. attenuation
			WIND	OFFS	<value>	Set analysis window
				STEP	<value>	Set linearity step
				WIDT	<value>	Set linearity width
		PULS			<value>	Set pulse index
		SET?			(strings)	Get user-defined parameters
		TIM	ACQ		<value>	Set acquisition duration
		WAV	SET		<value>	Set laser index
TRAC	ANA	BID			<filename>, <filename>	Start bidirectional analysis
		LIN			[filename]	Perform linearity test

Table 8-17. IQ-7000 OTDR Quick Reference Command Tree (Part 3 of 4)

Command				Parameter/ Response	Description
TRAC	ANA	UNI		<filename>	Start unidirectional analysis
	ATT?			(±9.99999E±999)	Get attenuation
	DAT	MARK	SET	<marker>, <value>	Set marker position
			SET?	(marker)	Get marker position
	LOSS	SPL?		(±9.99999E±999)	Get splice loss
		TWOP?		(±9.99999E±999)	Get two-point loss
	ORL?			(±9.99999E±999)	Get optical return loss
	REFL?			(±9.99999E±999)	Get reflectance

Table 8-17. *IQ-7000 OTDR Quick Reference Command Tree (Part 4 of 4)*

IQ-9100 Optical Switch Command Tree

Command	Parameter/ Response	Description
PROG [SEL] EXEC	—	Execute program
NAME	<string>	Load program
NAME?	(string)	Get program name and path
STAT	<0..3|RUN|PAUS|STOP|CONT>	Control program
STAT?	(STOPPED|PAUSED|RUNNING)	Get program state
ROUT CLOS	—	Turn off Optical Switch
OPEN	—	Turn on Optical Switch
OPEN?	(0|1)	Optical Switch active?
PATH CAT?	(9 x 99)	Get type of switch
SCAN	<1..32|BYPASS|INSERT>	Set channel
SCAN?	(99)	Get channel

Table 8-18. *IQ-9100 Optical Switch Command Tree*

9 Error Messages

Error Message Format

System and device specific errors are managed by the SCPI Manager. The generic format for error messages is illustrated in Figure 9-1.

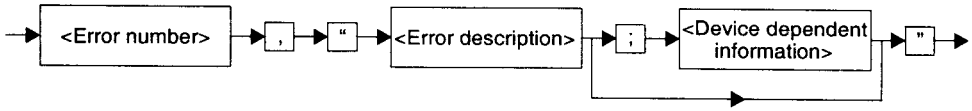

Figure 9-1. *Error Message Format*

As shown in the figure, the message contains three parts: the error number, the error description, and device dependent information. All error messages are stacked in a FIFO buffer. When there is at least one message in the buffer, bit 2 of the Status Byte Register is set to 1. Use the SYST:ERR? query to read the most recent message. The error message buffer is initialized when starting the SCPI Manager, when executing the *CLS command, or by reading the last message stored in the buffer.

- Error messages ending in a negative number are SCPI-based errors.
- Error messages ending in a positive number are specific to the IQ-200 system components.

SCPI Management Errors (System Errors)

Error Number	Description	Probable Cause
-100	"Command error."	The SCPI Manager does not recognize the command, likely due to invalid module address.
-101	"Undefined header."	The SCPI Manager does not recognize the command, likely due to incorrect grammar.
-102	"Missing parameter."	A required data parameter was not detected.
-103	"Parameter not allowed."	Too many parameters were detected for the specified command.
-104	"Data type error."	A data parameter is not the expected data type.
-105	"Undefined command tree."	The command tree is not defined for the specified module address.
-106	"Undefined terminator."	The SCPI Manager does not recognize the command, likely due to invalid message terminator.
-200	"Execution error."	An error occurred while executing the command.
-201	"Illegal parameter value."	A data parameter is not in the expected value range.

Table 9-1. *SCPI Management Error Messages (Part 1 of 2)*

Error Number	Description	Probable Cause
-300	"Device dependent error."	The device (module application) did not respond to the command within the given time-out value.
-400	"Query error."	Attempt to read an empty buffer or buffer data has been lost.

Table 9-1. *SCPI Management Error Messages (Part 2 of 2)*

IQ-200 Optical Test System Error Messages

Error Number	Description	Probable Cause
2	"Application error."	The system was unable to load the requested module application.

Table 9-2. IQ-200 Optical Test System Error Messages

IQ-Power Meter Series Error Messages

Error Number	Description	Probable Cause
1	"Unknown command."	The power meter has received a command that it does not recognize.
102	"Not compatible with current channel."	The command is not supported by the IQ-1200 4-Channel Power Meter.
103	"Light on detector."	A null command has been attempted with light reaching the detector.
104	"Invalid parameter."	The power meter has received a data parameter that it was not expecting.
105	"Parameter out of range."	The power meter has received a data parameter outside the valid range.
106	"Acquisition already running."	A command to start data acquisition was sent while acquisition was already in progress.
107	"Acquisition not running."	A command to stop acquisition was sent with no acquisition in progress.
108	"Cannot open file."	Available disk space is less than 10 Mbytes when attempting to perform a data acquisition.
109	"No available data."	A FETCh command was received without a previous INIT, i.e., there is no data in the data output buffer.

Table 9-3. IQ-Power Meter Series Error Messages

IQ-1600 High-Speed Power Meter Error Messages

Error Number	Description	Probable Cause
1602	"Invalid channel."	The specified channel number is not valid.
1603	"Light on detector."	A null command has been attempted with light reaching the detector.
1604	"Invalid parameter."	The high-speed power meter has received a data parameter that it was not expecting.
1605	"Parameter out of range."	The high-speed power meter has received a data parameter outside the valid range.
1606	"Acquisition already running."	A command was sent while an acquisition was in progress.
1607	"Acquisition not running."	A command that needs an acquisition to be accepted was sent with no acquisition in progress.
1612	"Invalid unit."	The specified unit is not valid.
1613	"Invalid value."	The specified value is not valid.
1614	"Invalid module."	The selected IQ-1600 module is not available or is incompatible.
1615	"Invalid sampling rate."	The selected sampling rate is not compatible with the current acquisition mode (continuous or single).

Table 9-4. *IQ-1600 High-Speed Power Meter Series Error Messages (Part 1 of 2)*

Error Number	Description	Probable Cause
1616	"Module timeout on nulling."	A nulling process could not be performed.
1617	"Automatic range cannot be used for single acquisition."	A manual range must be selected for a single acquisition.
1618	"Command not processed: internal error."	An internal error caused the command to fail.
1620	"Invalid range."	The specified type of range is not valid.
1621	"Unable to open file."	Available disk space is low.

Table 9-4. *IQ-1600 High-Speed Power Meter Series Error Messages (Part 2 of 2)*

IQ-2100 Light Source Error Messages

Error Number	Description	Probable Cause
402	"Illegal parameter value."	An illegal data parameter has been received.
403	"Attenuation out of range."	A command has attempted to set the internal attenuation to an unsupported value.
404	"Not compatible with current module."	The source has received a command that it does not recognize.

Table 9-5. IQ-2100 Light Source Error Messages

IQ-2300 ASE Laser Source Error Messages

Error Number	Description	Probable cause
1	"Unknown command."	The ASE source has received a command that it does not recognize.
402	"Illegal parameter value."	An illegal data parameter has been received.

Table 9-6. *IQ-2300 ASE Laser Source Error Messages*

IQ-2400 WDM Laser Source Error Messages

Error Number	Description	Probable Cause
1	"Unknown command."	The WDM laser source has received a command that it does not recognize.
1401	"Invalid parameter."	The source has received a data parameter that it was not expecting.
1402	"Parameter out of range."	The source has received a data parameter outside the valid range.
1403	"Invalid setpoint name."	The setpoint name specified does not exist in the setpoints list.
1404	"Invalid mode."	A request was made that cannot be executed in the current mode.
1406	"Source not active"	The source has received a command that it was not expecting.

Table 9-7. *IQ-2400 WDM Laser Source Error Messages*

IQ-2600 Tunable Laser Source Error Messages

Error Number	Description	Probable Cause
1101	"Parameter out of range."	The Tunable Laser source has received a data parameter outside the valid range.
1102	"Invalid parameter."	The Tunable Laser source has received a data parameter that it was not expecting.
1103	"Cannot execute command".	A command was sent while unallowed by the application state.
1104	"Query error".	Internal error.

Table 9-8. *IQ-2600 Tunable Laser Source Error Messages*

IQ-3100/3300 Variable Attenuator/Reflector Error Messages

Error Number	Description	Probable Cause
1	"Unknown command."	The module has received a command that it does not recognize.
202	"Communication error."	A command has taken longer than expected to complete execution.
203	"Settings conflict."	There is a conflict between the current state of the program and the program control command just received.
204	"Invalid parameter."	An invalid data parameter has been received.
205	"Wavelength list full."	A command has attempted to add more than 100 wavelengths to the wavelength list box.
206	"No program loaded."	An attempt has been made to activate a program, but no such program is loaded in the module's memory.
207	"Program running."	➤ A command that will halt the currently executing program has been received. ➤ An attempt has been made to override a program setting.
208	"Not in reference mode."	A reference value was requested while in Absolute mode.

Table 9-9. *IQ-3100/3300 Variable Attenuator/Reflector Error Messages*

IQ-3200 Return Loss Meter Error Messages

Error Number	Description	Probable Cause
301	"Unknown command."	The IQ-3200 has received a command that it does not recognize.
302	"Light on detector."	A null command has been attempted with light reaching the detector.
303	"Invalid reference."	An invalid calibration reference value has been specified.
304	"Invalid wavelength."	The selected wavelength is out of range or is not a valid wavelength value.

Table 9-10. *IQ-3200 Return Loss Meter Error Messages*

IQ-3400 PDL/OL Meter Error Messages

Error Number	Description	Probable Cause
801	"Unknown command."	The module has received a command that it does not recognize.
802	"Bad unit selection."	An incorrect unit has been selected (dB or %).
803	"Scanning already running."	A scan command has been sent while acquisition was already in progress.
804	"Scanning not running."	A stop scan command has been sent with no acquisition in progress.
805	"Light on detector."	A null command has been attempted with light reaching the detector.
806	"Invalid wavelength."	An incorrect wavelength has been selected.
807	"Invalid reference."	An invalid calibration reference value has been specified.
808	"Not compatible with current mode."	An ORL command has been sent to a module in PDL mode or vice versa.

Table 9-11. IQ-3400 PDL/OL Meter Error Messages

IQ-5100 Polarization Controller Error Messages

Error Number	Description	Probable Cause
1	"Unknown command."	The IQ-5100 has received a command that it does not recognize.
702	"Scanning already running..."	A wavelength selection command, a scan period selection command or a voltage selection or query command has been sent while scanning was already in progress.
703	"Scanning not running..."	A stop scan command has been sent with no scanning in progress.
704	"Not available for this module..."	A voltage selection or voltage query command has been sent and the module type does not accept it.
705	"Parameter out of range..."	An invalid paramater value has been specified for a wavelength selection command, a scan period selection command or a voltage selection command.

Table 9-12. *IQ-5100 Polarization Controller Error Messages*

IQ-5200 OSA Error Messages

Error Number	Description	Probable Cause
1001	"Internal error."	The pointer is not valid. An allocation error has occurred.
1002	"Parameter out of range."	The OSA has received a data parameter outside the valid range.
1003	"Light on detector."	A null command has been attempted with light reaching the detector.
1004	"Invalid curve index."	The trace index is not valid.
1005	"Invalid unit."	The unit specified is not valid (<0 or >1).
1006	"Invalid channel."	The specified channel number is not valid.
1007	"Invalid test mode."	The EDFA, WDM, DFB, or Peak List results query was not executed.
1008	"Invalid information."	Invalid pointer when trying to change user or DUT information.
1009	"Overlapped channel."	The new channel superimposes an existing channel.
1010	"Acquisition in progress."	An acquisition is already running: the requested command cannot be executed.

Table 9-13. IQ-5200 OSA Error Messages (Part 1 of 2)

Error Number	Description	Probable Cause
1011	"Cannot modify data field."	A trace is displayed while trying to modify data in the Information page.
1012	"No active trace."	The requested action can only be executed while a trace is active.

Table 9-13. *IQ-5200 OSA Error Messages (Part 2 of 2)*

IQ-5310 Wavelength Meter Error Messages

Error Number	Description	Probable Cause
901	"Unknown command."	The module has received a command that it does not recognize.
902	"Invalid medium."	The medium "air" is not valid with THz spectral units.
903	"Light on detector."	A null command has been attempted with light reaching the detector.
904	"Parameter out of range."	The module has received a data parameter outside the valid range.
905	"Acquisition already running."	A command to start data acquisition was sent while acquisition was already in progress.
906	"Acquisition not running."	A command to stop acquisition was sent with no acquisition in progress.
907	"No data."	A FETCh command was received without a previous INIT, i.e., there is no data in the data output buffer.
908	"Not in reference mode."	A reference value was requested while in absolute mode.
909	"Calibration error."	An error has occurred during wavelength calibration.
910	"Acquisition running."	A command not allowed was sent while acquisition was in progress.

Table 9-14. IQ-5310 Wavelength Meter Error Messages

IQ-5320 Multi-Wavelength Meter Error Messages

Error Number	Description	Probable Cause
1500	"Invalid parameter."	An invalid data parameter has been received.
1501	"Not compatible with current unit."	Request is not permitted with the current unit.
1502	"Acquisition running."	A command not allowed was sent while acquisition was in progress.
1503	"Acquisition not running."	A command to stop acquisition was sent with no acquisition in progress.
1504	"No data."	A FETCh command was received without a previous INIT, i.e., there is no data in the data output buffer.
1505	"Parameter under range."	Parameters entered are below minimum allowed value.
1506	"Parameter over range."	Parameters entered are above maximum allowed value.
1507	"Light on detector."	A null command has been attempted with light reaching the detector.

Table 9-15. *IQ-5320 Multi-Wavelength Meter Error Messages*

IQ-5500 PMD Analyzer Error Messages

Error Number	Description	Probable Cause
1	"Unknown command."	The module has received a command that it does not recognize.
602	"Bad unit selection."	The selected units do not correspond to the parameter being analyzed.
603	"Scanning already running."	An acquisition is already in progress.
604	"Scanning not running."	The acquisition is not in progress.
605	"Invalid source."	The selected light source is not compatible with the tests to be performed.
606	"Invalid data name."	The name you wish to assign to the data file is not valid.
607	"Invalid fiber type."	The specified fiber type is not valid ("Weak", "Strong" or "Component").
608	"Invalid wavelength."	The selected wavelength is out of range or is not a valid wavelength value.
609	"Invalid range."	The selected scanning range is not compatible with the test to be performed.
610	"Invalid curve size."	Buffer overflow of trace information.
611	"Invalid scan count."	The selected scan count is out of range or is not a scan count value.

Table 9-16. IQ-5500 PMD Analyzer Error Messages

Error Number	Description	Probable Cause
612	"Invalid delay."	The selected time delay between acquisitions is out of range or is not a valid selection.
613	"Invalid curve."	The selected trace is not a PMD file.
616	"Invalid length."	The specified fiber length is out of range.
617	"Invalid polarization selector."	The IQ-5550 Polarization Selector module is not available or not compatible.
618	"Invalid scan type."	The type of scan is not available for the test you wish to perform.
619	"Invalid instrument."	The selected unit is not available or not compatible.
620	"Invalid PMD module."	The selected PMD module is not available or is incompatible.
621	"Invalid scan mode."	The selected scan mode is not available.

Table 9-16. *IQ-5500 PMD Analyzer Error Messages*

IQ-6100 EDFA Error Messages

Error Number	Description	Probable Cause
1	"Unknown command."	The EDFA has received a command that it does not recognize.

Table 9-17. IQ-6100 EDFA Error Messages

IQ-7000 OTDR Error Messages

Error Number	Description	Probable Cause
30003	"Invalid parameter."	The specified parameter is incorrect.
30030	"Cannot open file."	The filename or path were incorrectly specified.
30072	"Memory error."	Memory allocation error.
30086	"Module not initialized."	The card was not initialized.
30087	"Module busy."	A command cannot be executed since the module is already in use.
30118	"No IOR selected."	The index of refraction was not defined.
30119	"No helix selected."	The helix factor was not defined.
30121	"Invalid file name."	The specified file name is incorrect.
30122	"No file in memory."	The acquisition memory is empty.
30123	"Analysis still in progress."	The analysis is still running.
30126	"No wavelength selected."	The wavelength was not selected.
30127	"No format saved."	A format must be specified so the file can be saved.
30128	"Invalid marker."	The specified marker does not exist.
30129	"Unable to read file."	A problem occurred while reading the file.

Table 9-18. IQ-7000 OTDR Error Messages

IQ-9100 Optical Switch Error Messages

Error Number	Description	Probable Cause
502	"Communication error."	A command has taken longer than expected to complete execution.
503	"Illegal program name."	An illegal or nonexistent path or filename has been received.
504	"No program running."	A command to stop or pause the program was received while no program was running.
505	"Channel out of range."	An invalid channel number has been requested.
506	"Program running."	➤ A command that cannot halt the currently running program has been received. ➤ An attempt has been made to override a program setting.
507	"Illegal parameter value."	A parameter was outside the expected range.
508	"No program paused."	A command to resume the program was received while no program was paused.

Table 9-19. *IQ-9100 Optical Switch Error Messages*

10 Troubleshooting

Problem	Probable Cause	Solution
Unable to communicate with IQ-203. (No response from *IDN? query)	SCPI Manager is not open.	Open SCPI Manager.
	Incorrect communication type selected.	Select the correct communication type: RS-232, GPIB, or DDE.
	Incorrect communication parameters.	Check the communication parameters: bus address, Baud rate, flow control, etc., as required.
	Incorrect termination characters.	Synchronize termination characters between the GPIB controller and the SCPI Manager.
	Poor bus connection.	Ensure the functioning of the controller card and make sure that the bus cable is properly connected.
	Improper configuration.	Verify that the GPIB interface (IQ settings-Config) is properly configured.
Receive "Undefined header" error.	Missing module address from command.	Ensure that the module address is incorporated in the command.

Table 10-1. Troubleshooting (Part 1 of 2)

Problem	Probable Cause	Solution
Receive "Undefined header" error. *(continued)*	Incorrect module address.	Ensure that the correct module address is being used.
	Incorrect command syntax.	Verify and correct syntax.
Unstable communications.	DMA is enabled.	Try with DMA disabled.
	Incorrect termination character.	Synchronize termination characters between the GPIB controller and the SCPI Manager.
Commands are working fine but the results and measurements are not as expected.	Synchronization problem with commands in program.	Use the *OPC? query after each command.
SCPI Manager unable to communicate with modules.	The module application is not open.	Open the module application.

Table 10-1. *Troubleshooting (Part 2 of 2)*

11 Warranty

General Information

EXFO Electro-Optical Engineering, Inc. (EXFO) warrants this equipment against defects in material and workmanship for a period of two years from the date of original shipment. EXFO also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, EXFO will, at its discretion, repair, replace, or issue credit for any defective product. This warranty also covers recalibration during two years if the equipment is repaired or if the original calibration is erroneous.

IMPORTANT

The warranty can become null and void if

- **the equipment has been tampered with, repaired, or worked upon by unauthorized individuals or non-EXFO personnel,**
- **the warranty sticker has been removed,**
- **case screws, other than those specified in this manual, have been removed,**
- **the case has been opened, other than as explained in this manual,**
- **the equipment serial number has been altered, erased, or removed,**
- **the equipment has been misused, neglected, or damaged by accident.**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL EXFO BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Liability

EXFO shall not be liable for damages resulting from the use of the purchased product, nor shall be responsible for any failure in the performance of other items to which the purchased product is connected or the operation of any system of which the purchased product may be a part.

Exclusions

EXFO reserves the right to make changes in the design or construction of any of its products at any time without incurring any obligation to make changes whatsoever on units purchased. Accessories, including but not limited to fuses, pilot lamps and batteries used with EXFO's products are not covered by this warranty.

Certification

EXFO certifies that this equipment met its published specifications at the time of shipment from the factory.

Service and Repairs

EXFO commits to providing product service and repair for five years after the date of purchase. To obtain service or repair for any equipment, follow the procedure below.

1. Call EXFO Customer Service Group. Support personnel will determine if the equipment requires service, repair, or calibration.
2. If the equipment must be returned to EXFO or an authorized service center, support personnel will issue a Return Merchandise Authorization (RMA) and an address for return.
3. If the unit has an internal storage device, do a backup of your data before sending the unit for repairs.

4. Pack the equipment in its original shipping material. Be sure to include a statement or report fully detailing the defect and the conditions under which it was observed.

IMPORTANT

Never send any unit or accessory back to EXFO without a Return Merchandise Authorization (RMA).

5. Return the equipment, prepaid, to the address given by the support personnel. Be sure to write the RMA on the shipping slip. EXFO will refuse and return any package which does not bear an RMA.

Note: *A test setup fee will apply to any returned unit which, after test, is found to meet the applicable specifications.*

After repair, the equipment will be returned with a repair report. If the equipment is not under warranty, the customer will be invoiced for the cost appearing on this report. Return-to-customer shipping costs will be paid by EXFO for equipment under warranty. Shipping insurance is at the customer's expense.

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Glossary

AC	Alternating current
adapter	A device for coupling two connectors.
amplifier	A device used to boost the strength (dB level) of a signal.
amplitude	The distance between high and low points of a waveform or signal.
ASCII	American Standard Code for Information Interchange. A system used to represent letters, numbers, symbols, and punctuation as bytes of binary signals.
ASE	Amplified Spontaneous Emission. Light emitted from the decay of the upper level of a lasing transition without stimulated emission. In general, this emission is spectrally broad and unpolarized.
attenuation	The diminution of average optical power. Attenuation results from absorption, scattering, and other radiation losses. Attenuation is generally expressed in dB without a negative sign.
attenuation coefficient	A factor expressing attenuation per unit length, expressed in dB/km.
attenuator	An optical device, either fixed or adjustable, that reduces the intensity of light propagating through it.
axis of birefringence	One of two generally orthogonal orientations transverse to the fiber core corresponding to fast and slow propagation of the group velocity of a light beam. In general, these orientations are elliptical and the orientation and amplitude vary along the fiber. In the special case of a HiBi fiber, the axes are linear and constant along the length of the fiber.
B_{fib}	Fiber bandwidth, normally dependent on carrier wavelength and fiber length.
B_{opt}	Optical bandwidth

backscattering That portion of scattered light that returns in a direction generally opposite to the direction of propagation.

bandwidth The range of frequencies handled by a device or system.

baud rate Measurement of data transmission speed, expressed in bits per second or bps.

beamsplitter A device for dividing an optical beam into two or more separate beams. It is often a partially reflecting mirror.

beat length In a reasonably uniform, birefringent medium, the distance over which a light wave propagating along the slow axis will accumulate a phase lag of one wavelength (2π) with respect to light propagating along the fast axis. As a rule, the shorter the beat length, the higher the fiber birefringence. Typical HiBi fibers have a beat length of 3 mm at 1550 nm.

Bellcore Bell communications research, an organization that contains much of the former Bell labs. It specializes in telephone network technology, standards and interfaces.

BER Bit error rate. On a transmission link, the number of digital "highs" that are interpreted as "lows", and vice versa, divided by the total number of bits received. In modern networks, BERs much better than 10^{-9} are expected.

birefringence The property whereby the effective propagation speed of a light wave in a medium depends upon the orientation of the electric field (state of polarization) of the light.

c Velocity of light in a vacuum = 299 792 458 m/s

°C Degree Celsius. To convert to Fahrenheit: $F = \frac{9}{5}C + 32$.

center wavelength For an optical source (e.g. DFB, FP laser, LED), the wavelength corresponding to the weighted average (center of gravity) of the power distribution. Mathematically,

$$\lambda_c = \frac{\sum \lambda_c P_i}{\sum P_i},$$

where P_i is the power of the *ith* constituent of the power distribution (e.g. one of the oscillating modes of a Fabry-Perot laser).

CFR Code of Federal Regulations

channel A communication path. For WDM systems, a channel is determined by a wavelength and width.

CNR Carrier-to-noise ratio

coherence A phenomenon whereby the phases of the photons (or constituent wavetrains) of a light beam maintain a definite relationship with each other. A narrow-linewidth laser is said to exhibit a high "degree of coherence".

connector A junction that allows an optical fiber or cable to be repeatedly connected or disconnected to a device such as a source or detector.

coupler A device whose purpose is to distribute optical power among two or more ports or to combine optical power from two or more fibers into a single port.

coupling ratio Value obtained by measuring the power at both output ports and providing the output ratio between them. Also, CR.

crosstalk The phenomenon of light leakage or information transmission from one wavelength channel to an adjacent channel, from a waveguide to an adjacent waveguide, or from one modulated carrier frequency to another.

CW Abbreviation for continuous wave. Refers to non-modulated, constant-intensity light.

CR Coupling ratio

dB Decibel

dBm Decibel referenced to a milliwatt.

DC Direct current

DDE Dynamic Data Exchange

decibel (dB) The standard unit used to express gain or loss of optical power. A standard logarithmic unit for the ratio of two powers.

DFB Distributed feedback (laser)

diffraction grating An optical element that causes a wavelength-dependent reflection, often at one or more wavelength-dependent angles. This element is based upon coherent scattering from an array of fine, parallel, equally spaced reflecting or transmitting lines.

directivity In a 3-port optical circulator, the ratio of power launched into port 1 that exits via port 2 vs. the fraction that exits via port 3.

distributed feedback laser (DFB) An injection laser diode that has a Bragg reflection grating in the active region to suppress multiple longitudinal modes and enhance a single-longitudinal mode.

DLL Dynamic Link Library

DMA Direct Memory Addressing

DUT Device under test

DWDM Dense wavelength division multiplexing

dynamic range Another commonly used term for "optical rejection ratio" in an optical system. See this term.

EDFA Erbium doped fiber amplifier

EDFFA Erbium doped fluoride fiber amplifier

EDFSA Erbium doped silica fiber amplifier

EIA Electronics Industries Association

EL Excess loss

electromagnetic interference Any electrical or electromagnetic interference that causes degradation, failure in electronic equipment, or undesirable response. Optical fibers neither emit nor are affected by EMI.

EMI Electromagnetic interference.

excess loss (EL) In relation to multiport components, the excess loss is a measure of the insertion loss over and above that induced by the splitting ratio.Excess loss is normally defined (in dB units) as the ratio of the input power divided by the sum of the powers in the output ports.

EOI	End of Image Marker
EOS	Effective Opening Size
ESB	Event Summary Bit
ESE	Standard Event Status Enable Register
ESR	Standard Event Status Register
f	Abbreviation for femto, which indicates 10^{-15} units.
f	Frequency, often also designated by ν.
FCC	Federal Communications Commission. A U.S. government body overseeing and regulating national electrical and radio communications. The FCC, formed in 1934, also deals with licences, tariffs, and limitations. The members of the commission are appointed by the U.S. president.
FIFO	First In First Out
FP	Fabry-Perot (laser or cavity).
frequency	The number of cycles per second, denoted by hertz (Hz).
Fresnel reflection	Reflection of a portion of the light incident on a planar interface between two homogeneous media having different refractive indices. For a perpendicularly-cleaved fiber terminated in air, the Fresnel reflection is -14 dB.
FSR	Free Spectral Range. Denotes spacing, in frequency units, between resonant modes of a cavity (e.g FP cavity).
FWHM	Full wave half maximum
G	Abbreviation for giga, which indicates 10^{9} units.
Ge	Germanium
GeX	High power germanium
GPIB	General Purpose Interface Bus
HiBi	High birefringence (fiber)
hr	Hour

HWHM	Half wave half maximum
Hz	Hertz. Denotes number of cycles per second.
IEC	International Electrotechnical Commission. A standardization body at the same level as ISO.
IEE	Institute of Electronic Engineering. It is a professional body covering all aspects of electronics and electrical engineering, including software, network, and computer engineering.
IEEE	Institute of Electrical and Electronics Engineering. It is a professional body very active, among other things, in many fiber-optic and opto-electronic related fields.
IL	Insertion loss
index matching material	A material, often a liquid or a cement, whose refractive index is nearly equal to the core index, used to reduce Fresnel reflections from a fiber's endface.
index of refraction	The ratio of the group velocity of light in a vacuum to the group velocity of light in a given medium.
InGaAs	Indium gallium arsenide.
insertion loss	The ratio of input power to output power in dB units (for a given output port) for an optical component such as a connector, splice, or coupler. For a multiport device, the insertion loss includes the splitting ratio and the excess loss.
ISA	Industry Standard Architecture
ISO	International Organization for Standardization. Commonly believed to stand for International Standards Organization. In fact, ISO is not an abbreviation—it is intended to signify uniformity (derived from the Greek *iso* meaning "equal"). ISO is responsible for many standards including those for data communications and computing.
ITU	International Telecommunications Union. The ruling body for telecommunications and the source of many network standards.

jumper Fiber-optic cable that has connectors terminated on both ends. Used to connect two pieces of equipment, modules, or components.

LoBi Low birefringence (fiber)

LD Laser diode

LED Light emitting diode

loopback Type of diagnostic test in which the transmitted signal is returned to the sending device after passing through a communications link or network.

M Abbreviation for mega, 10^6 units.

m Abbreviation for milli, 10^{-3} units.

min Minute

mode coupling The exchange of power among modes.

multiplexing The process by which two or more signals are transmitted over a single communications channel.

n Abbreviation for nano, 10^{-9} units.

n Refractive index. For the silica glass used in optical fibers, $n \approx 1.465$.

NBWDM Narrow band wavelength division multiplexing

NF Noise figure

NIST National Institute of Standards and Technology. U.S. governmental body that provides the assistance in developing standards. It was formerly the National Bureau of Standards.

noise figure A measure of the quality of an amplifier, defined as the ratio of output to input SNRs.

OFDR Optical frequency domain reflectometer

optical channel An optical wavelength band for wavelength division multiplexing optical communications.

optical rejection ratio (ORR)	For an optical instrument, generally defined as the ratio (in dB) of the smallest signal that can be observed (at a specified wavelength separation) in the presence of a strong, nearly saturating signal.
optical return loss (ORL)	The ratio (expressed in units of dB) of optical power, reflected by a component or an assembly, to the optical power incident on a component or assembly that is introduced into a link or system.
optical time domain reflectometer	A method of characterizing a fiber wherein an optical pulse is transmitted through the fiber and the resulting backscatter and reflections are measured as a function of time and, hence, as a function of distance.
OSA	Optical spectrum analyzer
OTDR	Optical time domain reflectometer
p	Abbreviation for pico, 10^{-12} units
P	Power
PC	In optical schematics, used to designate a polarization controller.
PCS	Plastic-clad silica (fiber)
PDCR	Polarization dependent coupling ratio
PDEL	Polarization dependent excess loss
PDG	Polarization dependent gain
PDL	Polarization dependent loss
peak wavelength	The wavelength at which the optical power of a source is at maximum.
PMF	Polarization maintaining fiber
Poincaré sphere	A three-dimensional graphical representation of the state of polarization of a light beam.

polarization controller
Instrument used to control the polarization state of the light. This type of equipment can produce different polarization states of the input light.

polarization dependent loss
A transmission loss that varies with input polarization state. Normally defined as $T_{max}(dB) - T_{min}(dB)$

polarization mode dispersion (PMD)
Pulse spreading in a singlemode fiber that arises on account of the different group velocities associated with each of the two principal states of polarization of the fiber.

polarizer
Component used to polarize light.

POTDR
Polarization OTDR

principal states of polarization (PSP)
The two generally orthogonal states of polarization of a monochromatic light beam launched into a fiber (input PSP) that will propagate through the fiber without spreading or distortion. The SOP of this light beam as it exits the fiber will be in one of two, generally orthogonal, output PSPs. In general, the output PSPs are not the same as the input PSPs, and the orientation of these PSPs changes with wavelength. Not to be confused with axes of birefringence. Only in the spectral case of a single HiBi fiber are the PSPs and the axes of birefringence the same.

Rayleigh scattering
Scattering by inhomogeneities in the fiber that are small with respect to wavelength. This scattering mechanism is present in all silica-based fibers. The OTDR principle is based upon the measurement of this backscattering.

RIN
Relative Intensity Noise. A useful measure of the inherent noise of an optical source as a function of frequency (relative to the carrier). Given as a ratio of noise power per frequency interval divided by the total power. For a DFB laser, a typical value is -100 dB/Hz at 100 MHz.

RMA
Return merchandise authorization

s
Second

SCPI
Standard Commands for Programmable Instruments

sensitivity	For an optical instrument, the smallest signal that can be detected in the absence of any other signal.
Si	Silicon
SMSR	Side mode suppression ratio
SNR	Signal-to-noise ratio. The ratio of the received optical power, divided by the noise floor for the optical system.
SRE	Service Request Enable Register
SRQ	Service Request
SSE	Source spontaneous emission
state of polarization (SOP)	The orientation of the electric field vector of a propagating optical wave. In general, this vector will trace an ellipse as it propagates. In special cases, it will remain oriented in one direction (linear polarization) or will trace out a circle (left or right circular polarization).
STB	Status Byte Register
t	Time
T	Abbreviation for tera, 10^{12} units.
V	volt
VA	volt-ampere
W	watt
wavelength	For monochromatic light, the distance between two successive peaks (or troughs) of the sinusoidally-varying electric-field amplitude. Note that, unlike frequency, the wavelength of light is inversely proportional to the refractive index of the medium through which it propagates. It is for this reason that accurate wavelength measurements are generally specified as being determined in "air" or in "vacuum".
WDM	Wavelength division multiplexing. A technique whereby two or more carrier wavelengths are transmitted over one optical fiber.

XT Crosstalk

λ lambda. Greek letter used to denote wavelength.

μ Abbreviation for micro, 10^{-6} units.

ν nu. Greek letter used to denote frequency. Traditionally, the physics community uses "ν" to denote frequency whereas the engineering community uses "*f*".

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