

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Exfo IQ-5320* at our website: ***Click HERE***

IQ-5320

Multi-Wavelength Meter

Instruction Manual

June 1999
P/N: MAN-131-I .3ACE

Third Edition

If the equipment described herein bears the CE *symbol, the said equipment complies with the European Community Directive and Standards found in the Declaration of Conformity.*

If the equipment described herein bears an **FCC** *statement, the said equipment complies with the relevant Federal Communications Commission standards.*

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of EXFO Electro-Optical Engineering, Inc. (EXFO).

Information provided by EXFO is believed to be accurate and reliable. However, no responsibility is assumed by EXFO for its use nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent rights of EXFO.

EXFO's Commerce And Government Entities (CAGE) code under the North Atlantic Treaty Organization (NATO) is 0L8C3.

The information contained in this document is subject to change without notice.

© 1999 EXFO Electro-Optical Engineering, Inc.

Words which we consider as trademarks have been identified as such. However, neither the presence nor absence of such identification affects the legal status of any trademark.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

CONTENTS

Certification Information ix

1 INTRODUCTION 1-1

1.1 IQ-200 Optical Test System Product Line 1-1
1.2 Safety Conventions 1-2
1.3 Safety Information 1-2
1.4 Transportation and Storage 1-3
1.5 Getting Help 1-3

2 HARDWARE OVERVIEW 2-1

2.1 Description of the IQ-5320 2-1
2.2 Laser Identification 2-2
2.3 Front Panel Description 2-3
2.4 Module Insertion 2-4
2.5 Optical Connections 2-5
2.6 Module Removal 2-7

3 SOFTWARE OVERVIEW 3-1

3.1 Installing the Application 3-1
3.2 Starting the Application 3-1
3.3 Viewing the Main Window 3-2
3.4 Using the Status Bar 3-3
3.5 Using the Monitor Window 3-3
3.6 Closing the Application 3-5

4 SETTING APPLICATION PARAMETERS 4-1

4.1 General Parameters 4-1
4.2 Test Parameters 4-6
4.3 Channel Parameters 4-11
4.4 Display Parameters 4-18
4.5 Use of Application Parameters 4-21
4.6 Storage of Application Parameters 4-22

5 TAKING MEASUREMENTS IN MONITORING MODE 5-1

5.1 Performing Offset Nulling 5-1
5.2 Setting Test Parameters 5-2
5.3 Making Acquisition in Monitoring Mode 5-6
5.4 Saving and Recalling Traces 5-6
5.5 Viewing Channel Results 5-8

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

5.6 Viewing Alarms 5-12
5.7 Viewing Measurement Results 5-13
5.8 Selecting Type of Graph 5-16
5.9 Viewing Trace Information 5-17

6 TAKING MEASUREMENTS IN DRIFT MODE 6-1

6.1 Performing Offset Nulling 6-1
6.2 Setting Test Parameters 6-2
6.3 Making Acquisition in Drift Mode 6-6
6.4 Saving and Recalling Traces 6-6
6.5 Viewing Channel Results 6-8
6.6 Viewing Alarms 6-11
6.7 Viewing Measurement Results 6-12
6.8 Selecting Type of Graph 6-14
6.9 Viewing Trace Information 6-15

7 GENERATING AND PRINTING A REPORT 7-1

7.1 Defining Report Parameters 7-1
7.2 Using the Report Template 7-5
7.3 Closing Report Window 7-6
7.4 Setting Report Print Parameters 7-7
7.5 Printing Report 7-10

8 SAVING 8-1

8.1 Saving a Trace 8-1
8.2 Saving Application Parameters 8-2

9 GPIB COMMANDS 9-1

9.1 Command Structure 9-1
9.2 Common Commands 9-2
9.3 Specific Commands 9-8
9.4 Quick Reference Command Tree 9-22
9.5 IQ-5320 Multi-Wavelength Meter Error Messages 9-26

10 MAINTENANCE AND TROUBLESHOOTING 10-1

10.1 Module Maintenance 10-1
10.2 Cleaning Fiber Ends 10-1
10.3 Cleaning Optical Ports 10-2
10.4 Recalibration 10-2
10.5 Troubleshooting 10-3

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

11 TECHNICAL SPECIFICATIONS 11-1

11.1 Wavelength Specifications 11-1
11.2 Power Specifications 11-2
11.3 General Specifications 11-3

12 WARRANTY 12-1

12.1 General Information 12-1
12.2 Liability 12-2
12.3 Exclusions 12-2
12.4 Certification 12-2
12.5 Service and Repairs 12-2

APPENDIX A – INTERFEROMETRIC WAVELENGTH MEASUREMENT THEORY 13-1

GLOSSARY GLOSSARY-1

INDEX INDEX-1

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

FIGURES

Figure 2-1. Module Nameplate 2-2
Figure 2-2. Laser Warning Sticker 2-2
Figure 2-3. IQ-5320 Front Panel 2-3
Figure 2-4. EUI Base Plate Options 2-5
Figure 2-5. EUI Connector Adaptor 2-6
Figure 2-6. Mounting EUI Connector Adaptor 2-6
Figure 2-7. Removing an IQ Module 2-7
Figure 3-1. Main Window 3-2
Figure 3-2. Monitor Window 3-4
Figure 4-1. Functions Option Page 4-1
Figure 4-2. Setup Window: General Page 4-2
Figure 4-3. General Setup: Detection Threshold Box 4-3
Figure 4-4. Detection Threshold 4-4
Figure 4-5. General Setup: Referenced Power Box 4-5
Figure 4-6. Setup Window: Test Page 4-6
Figure 4-7. Test Page: Monitoring and Average Sections 4-8
Figure 4-8. Setup Window: Test Page 4-10
Figure 4-9. Setup Window: Channel Page 4-11
Figure 4-10. Add Channel Window 4-13
Figure 4-11. Modify Channel Window 4-14
Figure 4-12. Delete Channel 4-16
Figure 4-13. Save List Window 4-17
Figure 4-14. Open List Window 4-17
Figure 4-15. Setup Window: Display Page 4-19
Figure 4-16. Display Page: Color Window 4-20
Figure 4-17. Save Config Window 4-22
Figure 5-1. Setup Tabs 5-2
Figure 5-2. Test Page: Monitoring and Average Sections 5-3
Figure 5-3. Save Trace Window 5-4
Figure 5-4. Open Config Window 5-5
Figure 5-5. Save Trace Window 5-7
Figure 5-6. Results Page: No Interchannel Data 5-8
Figure 5-7. Monitoring Mode: Results Page 5-8
Figure 5-8. Results Page: View Channel 5-12
Figure 5-9. Alarms Page 5-12
Figure 5-10. Measurements Page with Bar Graph Selected 5-13
Figure 5-11. Measurements Page with Curve Graph Selected 5-13
Figure 5-12. Measurements Page 5-14

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Figure 5-13. Magnifying Glass 5-15
Figure 5-14. Zoom Window 5-15
Figure 5-15. Monitoring Mode: Bar and Curve Graphs 5-16
Figure 5-16. Monitoring Mode: Graphic Type Selection Buttons 5-16
Figure 5-17. Trace Information Page 5-17
Figure 6-1. Setup Tabs 6-2
Figure 6-2. Setup Window: Test Page 6-3
Figure 6-3. Save Trace Window 6-4
Figure 6-4. Open Config Window 6-5
Figure 6-5. Save Trace Window 6-7
Figure 6-6. Drift Mode: Results Page 6-8
Figure 6-7. Results Page: View Channel 6-11
Figure 6-8. Alarms Page 6-11
Figure 6-9. Measurements Page 6-12
Figure 6-10. Magnifying Glass 6-13
Figure 6-11. Zoom Window 6-13
Figure 6-12. Drift Mode: Drift Graph 6-14
Figure 6-13. Drift Mode: Graph Selection Buttons 6-14
Figure 6-14. Trace Information Page 6-15
Figure 7-1. Report Window: DUT Page 7-1
Figure 7-2. Report Window: General Page 7-2
Figure 7-3. Report Window: Test Page 7-3
Figure 7-4. Report Window: Comment Page 7-4
Figure 7-5. Setup Window: Print Page 7-7
Figure 7-6. Print Page: Custom Report Section 7-8
Figure 7-7. Print Setup Window 7-9
Figure 8-1. Save Trace Window 8-1
Figure 8-2. Save Config Window 8-2

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

TABLES

Table 3-1.	Status Bar Messages	3-3
Table 4-1.	Tests and Appropriate Mode	4-7
Table 4-2.	Channel Parameters	4-12
Table 5-1.	Tests and Monitoring Mode Used	5-1
Table 5-2.	Monitoring Mode: Contents of Results Page	5-9
Table 5-3.	Definitions: Wavg. Pavg, and Ptot	5-11
Table 6-1.	Drift Mode Test	6-1
Table 6-2.	Drift Mode: Contents of Results Page	6-8
Table 9-1	Common Commands Summary	9-2
Table 9-2.	IQ-5320 Multi-Wavelength Meter Command Tree	9-22
Table 9-3.	IQ-5320 Multi-Wavelength Meter Error Messages	9-26
Table 10-1.	Problem, Possible Cause, and Recommended Action	10-3
Table 11-1.	Wavelength Specifications	11-1
Table 11-2.	Power Specifications	11-2
Table 11-3.	General Specifications	11-3

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

CERTIFICATION INFORMATION

F.C.C. INFORMATION TO USER

This unit has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the unit is operated in a commercial environment. This unit generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this unit in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or modifications not expressly approved by EXFO Electro-Optical Engineering could void the user's authority to operate the unit.

INDEPENDENT LABORATORY TESTING

This unit has undergone extensive CE certification testing both internally, at EXFO, and externally, at an independent, qualified laboratory. All pre-qualification tests were performed at EXFO while all final tests were performed at Diversified T.E.S.T. Technologies Inc., a renowned test laboratory from Gronton, New York. This guarantees the unerring objectivity and authoritative compliance of all test results.

CE INFORMATION TO USER

This unit has been tested and found to comply with the limits for a Class A digital device. Please see the Declaration of Conformity.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

1 INTRODUCTION

EXFO Electro-Optical Engineering, Inc. (EXFO) is pleased to introduce the IQ-5320 Multi-Wavelength Meter as part of the IQ-200 Optical Test System product line.

EXFO's commitment to superior design in all its fiber-optic instrumentation is respected throughout the industry and is based on the following four goals:

- reliable and accurate performance
- simple operation
- extensive features
- dedicated interest in customer needs

The IQ-5320 Multi-Wavelength Meter will provide many years of reliable operation. To benefit fully from the many features offered by the IQ-5320 Multi-Wavelength Meter, it is important to read the following instructions thoroughly.

1.1 IQ-200 Optical Test System Product Line

The IQ-200 Optical Test System product line is a modular optical test system designed for laboratory applications. Thanks to the Windows™ compatible IQ Software, the IQ-200 Optical Test System combines power, performance, and flexibility with a user-friendly interface. The main components of the system are the IQ-203 Mainframe, which can house three modules, and the IQ-206 Expansion Unit, which can house six modules. It is also possible to control one or several IQ-206 Expansion Units with an IQ-206 PC Expansion Card.

For more information on the IQ-200 Optical Test System and the IQ Software, please refer to the *IQ-200 Optical Test System Instruction Manual*.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

1.2 Safety Conventions

The following conventions should be understood before operating the unit:

WARNING	Refers to a potential *personal* hazard. It requires a procedure which, if not correctly followed, may result in bodily harm or injury. Do not proceed beyond a **WARNING** unless the required conditions are understood and met.
CAUTION	Refers to a potential *product* hazard. It requires a procedure which, if not correctly followed, may result in component damage. Do not proceed beyond a **CAUTION** unless the required conditions are understood and met.
IMPORTANT	Refers to any information regarding the operation of the product which should not be overlooked.

1.3 Safety Information

WARNING

Do not install or terminate fibers while a laser source is active. Never look directly into a live fiber and ensure that your eyes are protected at all times.

CAUTION

Use of controls, adjustments and procedures for operation and maintenance other than those specified herein may result in hazardous radiation exposure.

CAUTION

Use of optical instruments with this product will increase eye hazard.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

1.4 Transportation and Storage

Maintain a temperature range within specifications when transporting or storing the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- Pack the unit in the original packing material when shipping.
- Store unit at room temperature in a clean and dry area. Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shock and vibration.

1.5 Getting Help

If any difficulty is encountered while operating the unit, please call EXFO at one of the offices listed below. The Customer Service Group is available from 7:30 a.m. to 8:00 p.m. Eastern time, Monday to Friday.

EXFO Electro-Optical Engineering (Corporate Headquarters) 465 Godin Avenue Vanier QC G1M 3G7 Canada	1 800 663-3936 (USA and Canada) Tel.: (418) 683-0211 Fax: (418) 683-2170 support@exfo.com www.exfo.com
EXFO Europe Centre d'Affaires Les Metz 100, rue Albert Calmette 78353 Jouy-en-Josas, France	 Tel.: +33 1 34 63 00 20 Fax: +33 1 34 65 90 93

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

2 HARDWARE OVERVIEW

2.1 Description of the IQ-5320

The IQ-5320 Multi-Wavelength Meter is designed for the high-precision measurements required in testing and maintaining DWDM systems. By allowing you to perform laser diode spectral characterization, the IQ-5320 Multi-Wavelength Meter is ideal for controlling the drift of DWDM sources in transmission system qualification and reliability testing.

You can also use the IQ-5320 Multi-Wavelength Meter for characterizing and testing passive components, stabilizing flatness and redistributing EDFA spectral gain, and calibrating tunable lasers. The IQ-5320 Multi-Wavelength's internal reference HeNe laser provides absolute accuracy within a few picometers.

The IQ-5320 Multi-Wavelength Meter supports both local and remote control. Local control is via a Windows compatible software preinstalled in the IQ-203 mainframe unit or installed on a host PC when using the IQ-206 Expansion Card. The software provides a user-friendly interface offering flexible control of all the IQ-5320 Multi-Wavelength Meter features.

Remote control of the IQ-5320 is accomplished either through a GPIB interface or via a Windows Dynamic Data Exchange communication link. Please refer to the *IQ-200 GPIB and Application Development Guide* for detailed information about remote control of IQ components.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

The module nameplate, shown in Figure 2-1, provides the following information:

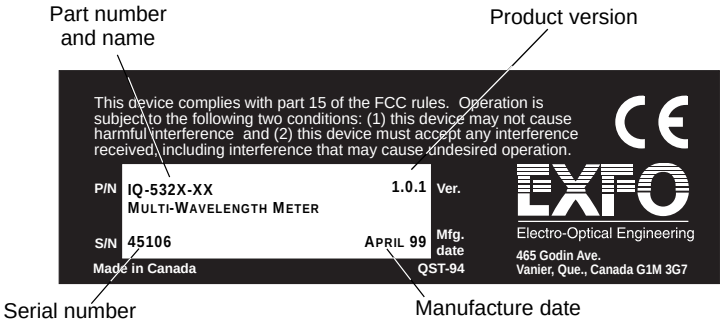


Figure 2-1. Module Nameplate

2.2 Laser Identification

The IQ-5320 is rated as a class 1 laser product according to IEC 60825-1: 1993 + A1: 1997 and 21 CFR 1040.10 and 1040.11.



Figure 2-2. Laser Warning Sticker

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

2.3 Front Panel Description

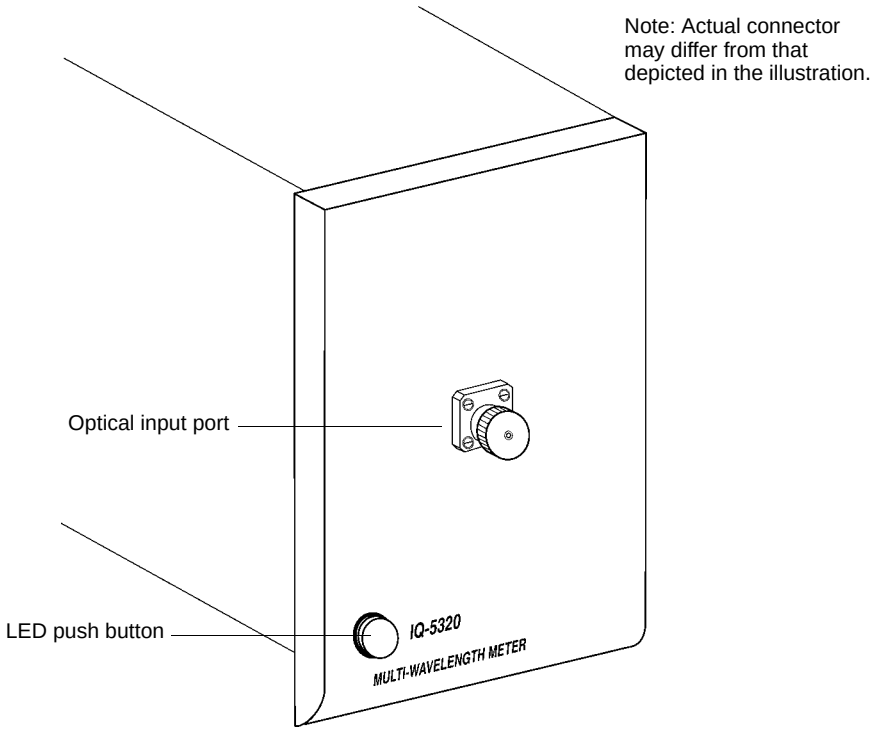


Figure 2-3. IQ-5320 Front Panel

2.3.1 Optical Port

The optical input port is located on the front face of the module.

When making acquisitions, connect the device or system under test to the optical input port. The port comes with either an ultra-polished physical contact (UPC) or an angled physical contact (APC), low reflectance connector.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

IMPORTANT

It is very important to keep optical ports clean. The protective caps should always be left on when the module is not in use.

2.3.2 LED Push Button

The LED push button on the front panel has two functions:

- It illuminates to indicate that the IQ-203 is powered on and the module has been successfully detected.
- It activates the IQ-5320 main window.

2.4 Module Insertion

CAUTION

Never insert or remove a module while the IQ-203/IQ-206 is powered on. This will result in damage to the module and the IQ-203/IQ-206.

To insert the module

1. Power off the IQ-203/IQ-206.

2. Insert the module into any available slot. When power is on, the IQ-203/IQ-206 will automatically recognize the IQ module no matter what slot it is inserted in.

IMPORTANT

Be sure to insert the module all the way to the back of the IQ-203/IQ-206 to ensure that the backplane connectors are properly mated. The module is correctly inserted when the module front panel is flush with the IQ-203/IQ-206 front panel.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

2.5 Optical Connections

IMPORTANT

Always clean fiber end prior to inserting into the port as explained below.

The fiber-optic cable end should be kept clean at all times to ensure optimum performance and to avoid erroneous acquisitions.

2.5.1 Fiber Connections

To clean the fiber end

1. Gently wipe the end with a lint-free swab dipped in isopropyl alcohol.

2. Dry using clean compressed air.

To connect the fiber-optic cable to the port

1. Ensure that the connector is dry.

2. Align the connector and port to prevent the fiber end from touching the outside of the port or rubbing against other surfaces.

3. Do not overtighten.

2.5.2 EXFO Universal Interface (EUI)

The EUI fixed base plate is available for connectors with angled (APC) or non-angled (UPC) polishing. A green dot in the top left corner of the base plate indicates that it is for APC type connectors as shown in Figure 2-4.



Figure 2-4. EUI Base Plate Options

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

To mount an EUI connector adaptor to the EUI base plate

1. Hold the EUI connector adaptor so the dust cap opens downwards as depicted in Figure 2-5 below.

2. Close the dust cap in order to hold the connector adaptor more firmly.

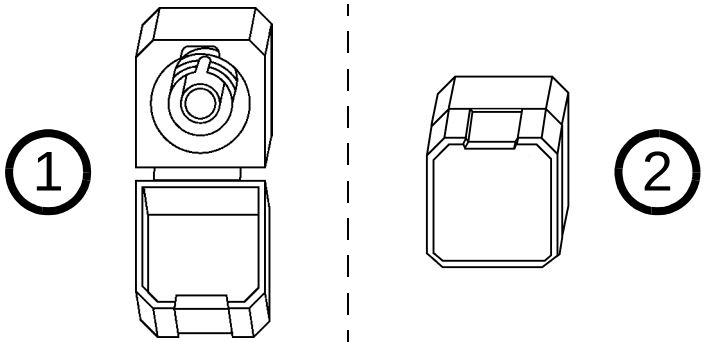


Figure 2-5. EUI Connector Adaptor

3. Insert the connector adaptor into the base plate.

4. Turn the connector adaptor clockwise to lock it in place.

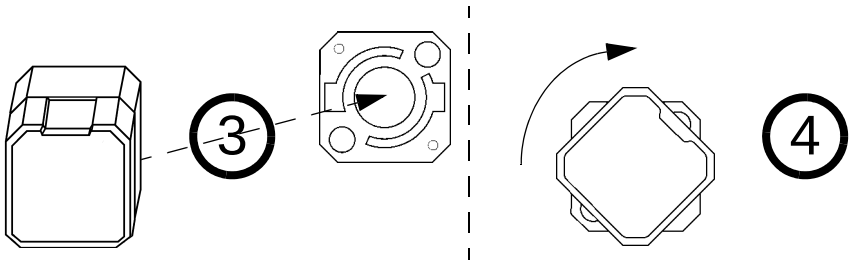


Figure 2-6. Mounting EUI Connector Adaptor

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

2.6 Module Removal

CAUTION

Never insert or remove a module while the IQ-203/IQ-206 is powered on. This will result in immediate irreparable damage to the module and to the IQ-203/IQ-206.

To remove module from IQ-203/IQ-206

1. Make sure the IQ-203 /IQ-206 is powered off.

2. If your module has a locking mechanism, push up the locking mechanism under the front panel of the module, as shown in Figure 2-7. Otherwise, simply place your fingers under the front panel of the module.

3. Firmly pull the module outward.

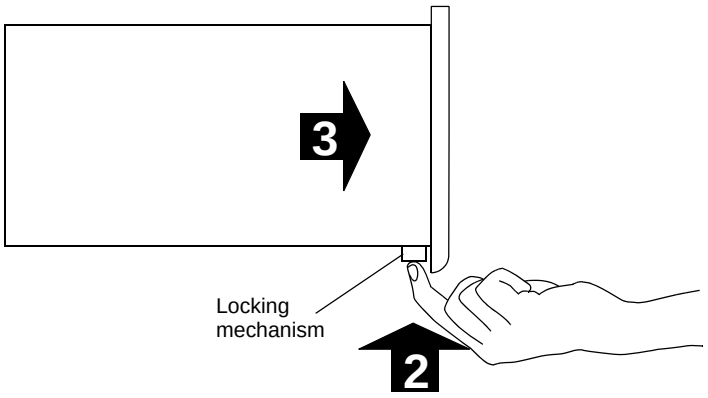


Figure 2-7. Removing an IQ Module

4. Put one of the supplied protective covers over the empty slot to prevent dust from entering the module housing.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

3 SOFTWARE OVERVIEW

3.1 Installing the Application

The IQ-5320 application software is included with the Windows 95 compatible IQ-200 Optical Test System, version 2.4R0 and later.

To install the IQ-200 Optical Test System

1. Insert the first installation diskette into the disk drive.
2. Execute the file “setup.exe”, then follow the on-screen instructions.
3. Once the installation is complete, reboot your PC or IQ-203 Mainframe for the changes to take effect.

3.2 Starting the Application

To start the application

- push the LED push button on the front panel, or
- double-click the IQ-5320 icon in the IQ-200 Optical Test System main window.

The icon will appear only if a module is in the IQ-200 platform.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

3.3 Viewing the Main Window

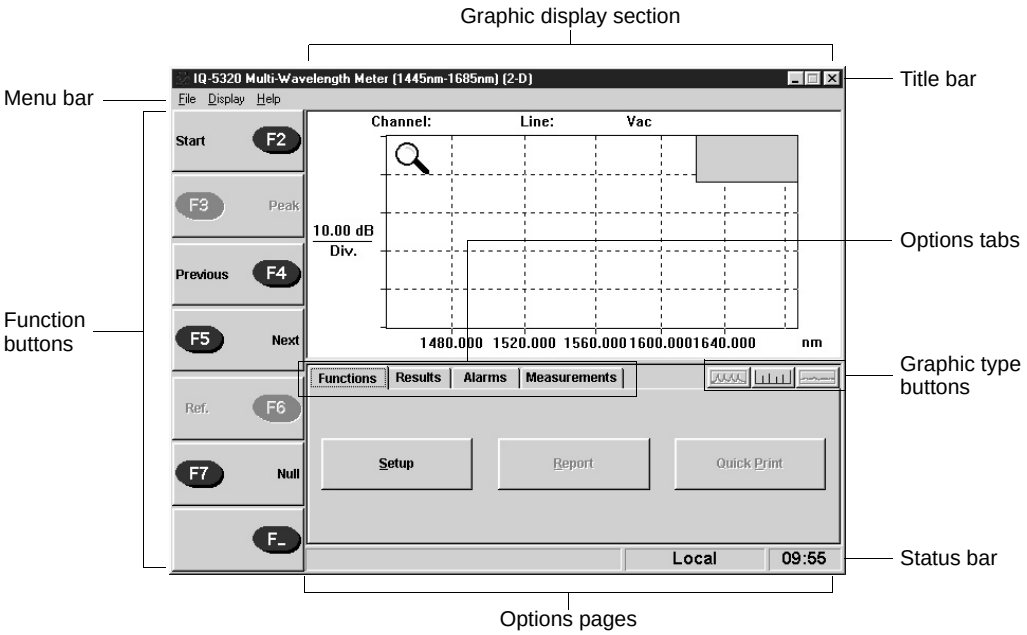


Figure 3-1. Main Window

Note: *The* **Trace Info** *tab is present only when a trace is displayed in the Graphic display section.*

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

3.4 Using the Status Bar

The status bar displays a message indicating the status of the module, as described in the following table.

Message	Status
Initializing...	Module is initializing when application is started up
Processing...	Module is executing a nulling or calibration
Scan in progress...	Module is making an acquisition
Scan stopped.	The Stop button has been pressed to interrupt the scan
Scan completed.	The module has completed the scan
Waiting for start time...	Module is waiting for the first scan to be started
Waiting for next scan...	Module is waiting for the next scan to begin
Waiting for stabilization...	Module is stabilizing
Rescaling...	Due to important power fluctuations, the acquisition system stops until the analog circuit has stabilized

Table 3-1. Status Bar Messages

3.5 Using the Monitor Window

The monitor window displays basic Multi Wavelength Meter data. Using the monitor window with other module monitor windows allows you to create an integrated data display screen (refer to the *IQ-200 Optical Test System Instruction Manual*). The size and position of the monitor window can be customized.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

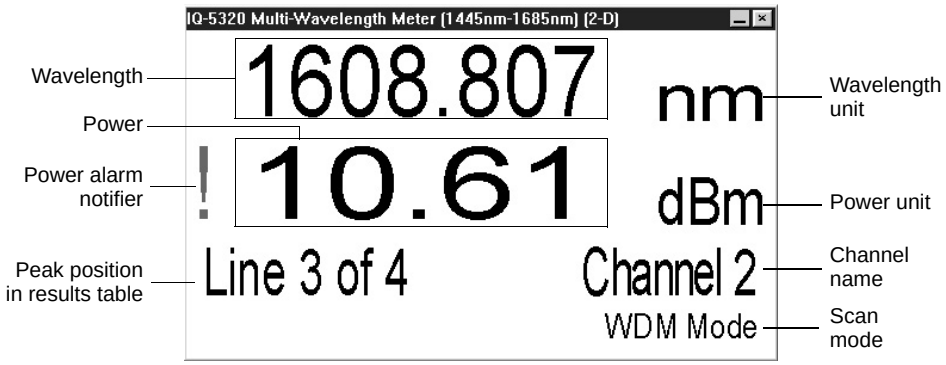


Figure 3-2. Monitor Window

3.5.1 Opening the Monitor Window

There are two ways to open the monitor window:

- Choose **Monitor** from the **Display** menu in the main window.
- Push the LED push button on the front panel of the module.

3.5.2 Closing the Monitor Window

There are two ways to close the monitor window to return to the main window:

- Double-click anywhere in the monitor window.
- Push the LED push button on the front panel of the module.

Note: *The function buttons can be accessed from the monitor window by positioning the cursor inside the monitor window and clicking the right mouse button. The function button keypad will appear to the left of the monitor window.*

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

3.6 Closing the Application

You can close the application from the IQ-5320 main window from the IQ-200 Optical Test System monitor window or from the IQ-200 Optical Test System main window.

If you have not already saved your work, you will be prompted to do so before closing the application.

3.6.1 From the IQ-5320 Main Window

From the main window, click **Exit** in the *File* menu.

3.6.2 From the IQ-200 Optical Test System Monitor Window

1. Select **Monitor** from the *Display* menu of the main window of the IQ-5320 application.

2. Click on  in the top right corner of the IQ-5320 monitor window.

3.6.3 From the IQ-200 Optical Test System Application

You can also exit the IQ-5320 application by closing the IQ-200 Optical Test System.

1. Select **Monitor** from the *Display* menu of the main window of the IQ-5320 application.

2. Click **Exit** in the *file* menu of the IQ-200 Optical Test System main window.

   A window appears, containing the following message: **Closing the IQ-200 application now will close all module applications.**

3. Click **OK** to proceed or **Cancel** to keep the application open.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4 SETTING APPLICATION PARAMETERS

To set the application parameters, open the *Setup* window.

To open the *Setup* window

1. Click on the **Functions** tab to display the functions option page.
2. Click on **Setup** in the functions option page.

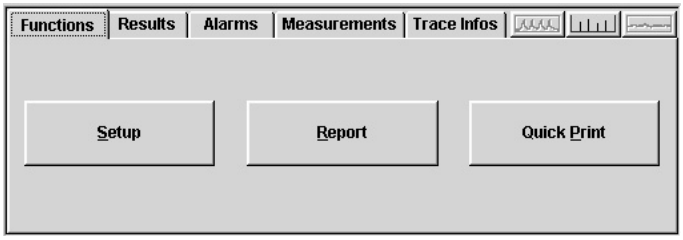


Figure 4-1. Functions Option Page

In the *Setup* window, click on the tab naming the parameters you wish to set. For example, to set the test parameters, open the **Test** page by clicking on the **Test** tab.

4.1 General Parameters

The General page allows you to:

- set power and wavelength units
- choose whether or not to show interchannel data
- set the detection threshold
- set the referenced power value
- select the appropriate medium
- enter a power offset level

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

To open the **General** page, click on the **General** tab of the *Setup* window.

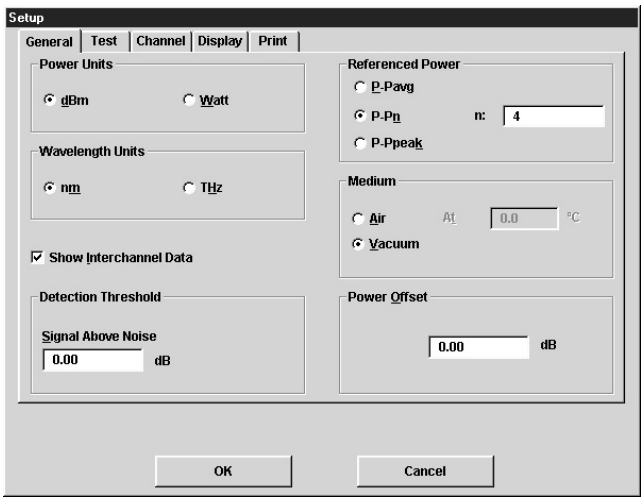


Figure 4-2. Setup Window: General Page

4.1.1 Power Units

You can display the power in decibels referenced to a milliwatt (dBm) or in watts (W). Select the power unit by clicking on the appropriate radio button in the **Power Units** box. The default power unit is the dBm.

Note: *When power units are watts, relative power measurements are in %. When power units are dBm, relative power measurements are in dB.*

4.1.2 Wavelength Units

You can display the wavelength in nanometers (nm) or in terahertz (THz). Select the wavelength unit by clicking on the appropriate radio button. The default wavelength unit is the nm.

Note: *If you select THz, all references to* **Wavelength** *in the application interface will be changed to* **Frequency**.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.1.3 Interchannel Data

Interchannel data is information pertaining to the areas of the spectrum found between the detected peaks. These peaks are listed in the **Results** page, which is described in *Viewing Channel Results*, on page 5-8.

Interchannel data displays

- the distance between two adjacent peak center wavelengths
- the difference in power between the two peaks

To show interchannel data, check the **Show Interchannel Data** box.

4.1.4 Detection Threshold

The detection threshold setting determines the minimum level above noise at which the peaks will be detected. The unit of the detection threshold depends on the power unit.

- If the power unit is the decibel referenced to a milliwatt (dBm), the detection threshold unit is the dB.
- If the power unit is the watt (W), the detection threshold is expressed in %.

The detection threshold must be a value between 0 dB and 10 dB. The default value is 0 dB.

For example, to double the default threshold, set the edit field to 3 dB or 100%, depending on current power unit.

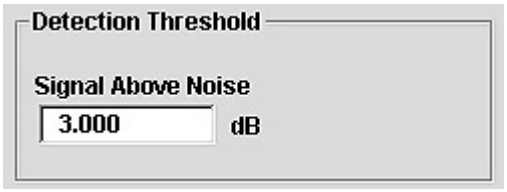


Figure 4-3. General Setup: Detection Threshold Box

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

The following figure shows the use of the detection threshold.

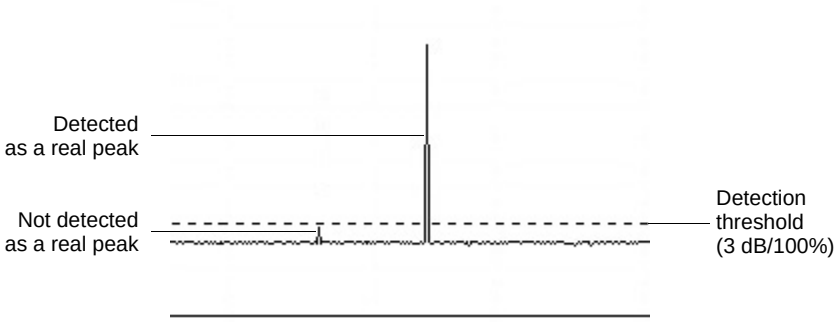


Figure 4-4. Detection Threshold

Note: *It is not possible to change the detection threshold once data has been acquired. When no module is present, the* **Detection Threshold** *section is inactive.*

4.1.5 Referenced Power

The referenced value of a channel allows you to compare each detected peak to one of three possible power references. The possible power references are

- the average power, Pavg, which is the sum of the peak powers divided by the total number of peaks
- the power of a specific peak, Pn, where n is the number of a specific peak
- the peak power, Ppeak, which is the power of the strongest peak

The referenced power is the difference between the channel power, P, and the power reference. For example, P-Pavg is the referenced power of the peak power P using power reference Pavg. It is displayed in the last column of the **Results** table of the main window, in the same unit as the power.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

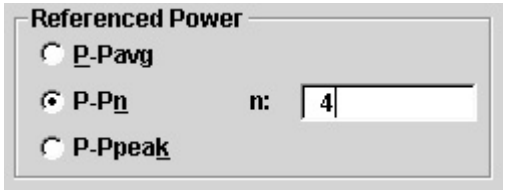


Figure 4-5. General Setup: Referenced Power Box

Select a referenced power by clicking on the appropriate radio button. If you select **P-Pn**, you must enter the number, n, of the peak which will serve as power reference in the text field next to **P-Pn**.

4.1.6 Medium

Select air or vacuum. The default medium is vacuum.

If you select air, you must specify a temperature in the text field next to **Air** as shown in Figure 4-2. This sets the reference temperature at which the IQ-5320 calculates the wavelengths, and not the temperature at which measurements are taken. The default reference temperature is 23°C.

Note: *If the selected wavelength units are THz, the* **Medium** *section is inactive. For details, see* Section 4.1.2, *Wavelength Units.*

4.1.7 Power offset

The power offset unit is

- % if the power unit is W
- dB if the power unit is dBm

The offset must remain between -3.01 dB and 3.01 dB (-50.0% and 100%)

Enter the required power offset value in the text field in the **Power Offset** section. The default power offset is zero.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.2 Test Parameters

To set the test parameters, click on the **Test** tab in the *Setup* window. Depending on your needs, you can set the scan type to one of two modes:

- Monitoring mode
- Drift mode

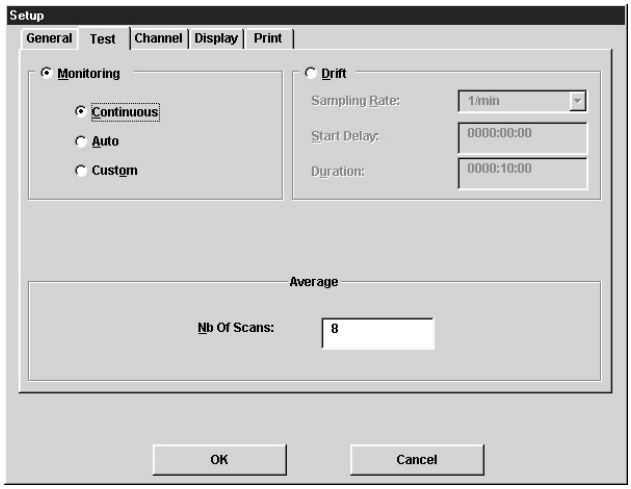


Figure 4-6. Setup Window: Test Page

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

The following table describes the types of tests that may be performed along with the mode allowing you to perform them.

Test Description	Mode Used	Parameters to Set
Continuous scanning	Continuous monitoring	If progressive average is desired, set the number over which progressive averaging will take place
Eight scans, displaying average result, and stopping	Auto monitoring	None (the total number of scans is automatically set to eight)
User defined number of scans, displaying average result and stopping	Custom monitoring	Required number of scans
Long-term drift measurements	Drift	• sampling rate • duration of drift test • start delay • number of scans averaged at each sampling point

Table 4-1. Tests and Appropriate Mode

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.2.1 Continuous Scanning

For continuous scanning, you must test in Continuous Monitoring mode.

To test in Continuous Monitoring mode

1. Click on the **Monitoring** radio button of the **Test** page.
2. Click on the **Continuous** radio button.
3. Specify the number of scans over which the module will take progressive averages of the results in the **Nb Of Scans** text field.

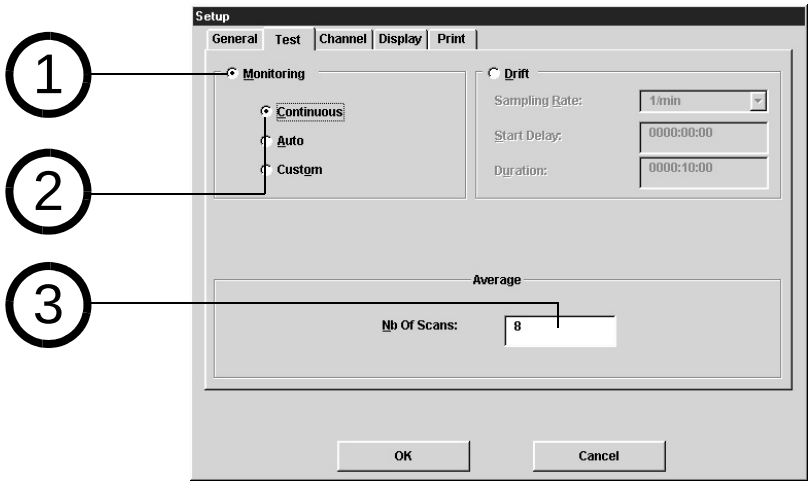


Figure 4-7. Test Page: Monitoring and Average Sections

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.2.2 Eight Scans, Displaying Average, and Stopping

To test using eight scans, select Auto Monitoring Mode.

1. Click on the **Monitoring** radio button of the **Test** page.

2. Click on the **Auto** radio button.

4.2.3 User-Defined Number of Scans, Displaying Average Result and Stopping

To test and average using a number of scans other than eight, select Custom Monitoring Mode.

1. Click on the **Monitoring** radio button of the **Test** page.

2. Click on the **Custom** radio button.

3. Specify the number of scans you wish the module to complete in the **Nb Of Scans** text box.

4.2.4 Long-Term Drift Measurements

To make measurements of wavelength with respect to time using a specified number of scans, sampling intervals, duration, and rate, select Drift Mode. Before testing in drift mode, you must set

- the sampling rate, which determines the frequency of the scans
- the start delay, which determines the time before the scans will start
- the duration of the testing
- the number of scans averaged at each sampling point.

Note: *A Drift Mode acquisition cannot be taken without a list of predefined channels. A peak which is not within any defined channel will not be monitored in Drift Mode. You must define the channels via the* **Channel** *page, as described in Channel Parameters, on page 4-11.*

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

To set the drift mode parameters

1. Click on the **Drift** radio button of the **Test** page.

2. Select the appropriate value from the **Sampling Rate** list box.

   To change the sampling rate, click in the list box and type in the sampling rate. It must be expressed as 1/x sec, 1/x min, or 1/x h, where x is a positive integer. The last edited sampling rate is stored in the list.

3. Fill in the other two parameter text fields as indicated by the forced time format, **hhhh : mm : ss**.

4. Set the number of scans averaged at each sampling point in the **Nb of Scans** list box.

5. Define channels via the **Channel** page, as described in *Channel Parameters*, on page 4-11.

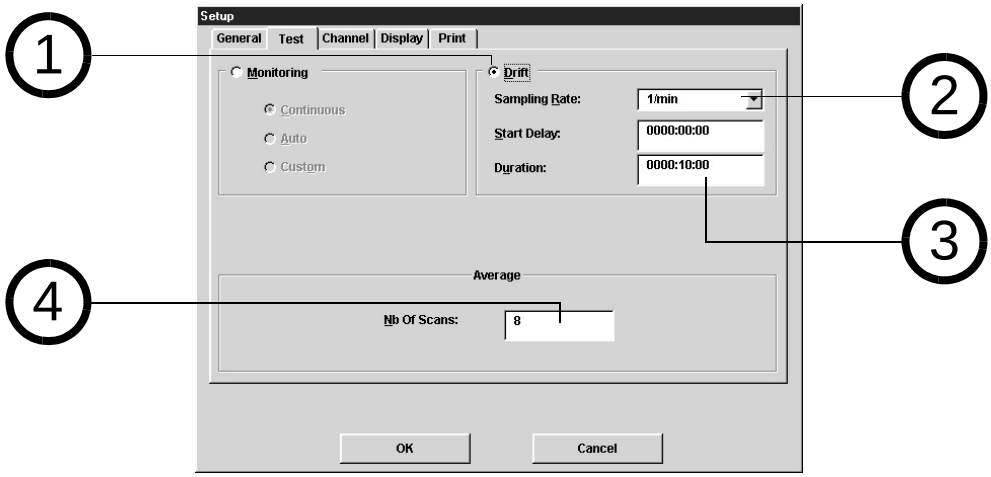


Figure 4-8. Setup Window: Test Page

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Note: *The* **Duration** *must be greater than the period between two samples. For example, if the* **Sampling Rate** *is set at 1/20min, the test duration must be greater than 20 minutes. Also, the* **Nb of Scans** *(average) must be smaller than the* **Sampling Rate** *by approximately 10 due to the stabilizing time. For example, for a* **Sampling Rate** *of 1/min, the maximum* **Nb of Scans** *permitted will be 60.*

4.3 Channel Parameters

Each detected peak must be associated with a user-defined channel in order to be identified in the measurements page, which makes for easier analysis of results. Also, for a peak to be tracked in drift mode, it must be associated with a user-defined channel.

To define the reference channels and their alarm settings, click on the **Channel** tab in the *Setup* window.

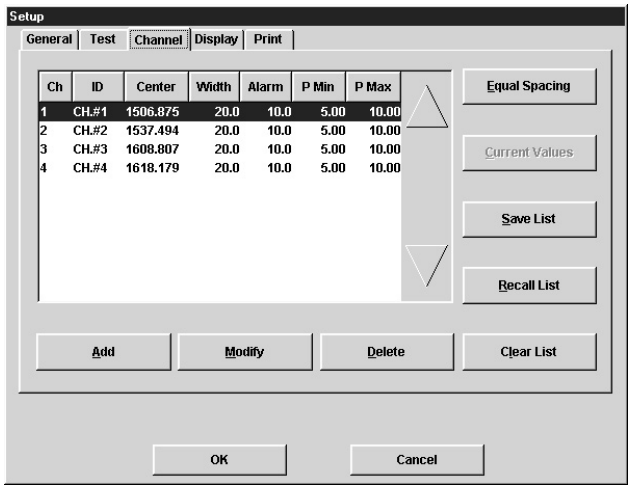


Figure 4-9. Setup Window: Channel Page

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

To define the reference channels, you must specify the various parameters appearing in the channel list column titles of the **Channel** page.

Column	Explanation
Ch	The channel's number in the list (automatically set).
ID	The channel's given name, which must be eight characters or less.
Center	The expected wavelength of the channel peak. It must be given in the unit in use (nm or THz).
Width	The length of the interval centered on the channel center. A peak detected outside the channel width is not considered as being within the channel. The **Width** must be greater than 5 GHz and less than 2000 GHz.
Alarm	The **Alarm** sets an interval within a channel, which must contain the detected peak. If the detected peak is outside this interval, an exclamation mark, " ! ", appears next to the channel in the various application lists. The alarm is given in the unit in use (nm or THz). The **Alarm** must be greater than 0.3 GHz and less than 1999.9 GHz.
P Max	**P Max** is the alarm upper limit to the peak power. It must be given in the unit in use (mW or dBm). If the channel peak power is greater than **P Max**, an exclamation mark, " ! ", will appear next to the channel in the various application lists. The **P Max** must be greater than -39.99 dBm (0.001 mW) and less than 10.00 dBm (10.00 mW).
P Min	**P Min** is the alarm lower limit to the peak power. It must be given in the unit in use (W or dBm). If the channel peak power is lower than **P Min**, an exclamation mark, " ! ", will appear next to the channel in the various application lists. The **P Min** must be greater than -40.00 dBm (0.001 mW) and less than 9.99 dBm (9.99 mW).

Table 4-2. Channel Parameters

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.3.1 Adding a Channel

To insert a new channel into the channel list

1. Click on **Add** at the bottom of the **Channel** page. The *Add Channel* window appears.

2. Enter the values of the parameters to be set by filling in the appropriate text boxes.

3. Click on **OK**. The new channel will appear in the list of the **Channel** page.

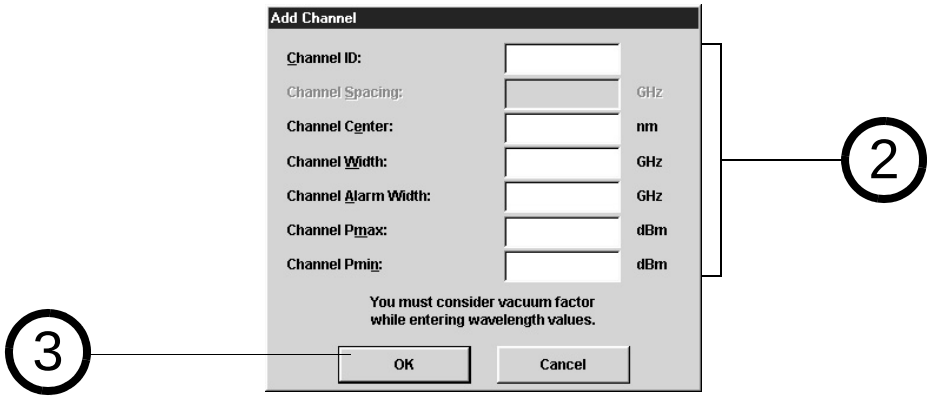


Figure 4-10. Add Channel Window

Care must be taken to avoid overlapping channels. Two channels are said to overlap when they contain the same part of the spectrum. For example, when the lower limit (center - width/2) of a channel centered on 1552.5 nm is smaller than the upper limit (center + width/2) of a channel centered on 1550 nm, the channels overlap.

Note: *If the current spectral units are nm, a message appears at the bottom of the Insert Channel window indicating that the wavelength center value will be taken in the active medium (air or vacuum). It is recommended that you define channel and alarm widths in GHz and not nm, because when working in frequency, the medium does not need to be specified.*

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.3.2 Modifying a Channel

To modify a channel listed in the **Channel** page

1. Select the channel to be modified in the channel list.
2. Click on **Modify** in the **Channel** page.
3. Enter the values of the parameters to be set by filling in the appropriate text boxes.
4. When all the channel settings have been redefined, click on **OK**. The modified channel will appear in the list of the **Channel** page, in place of the old one.

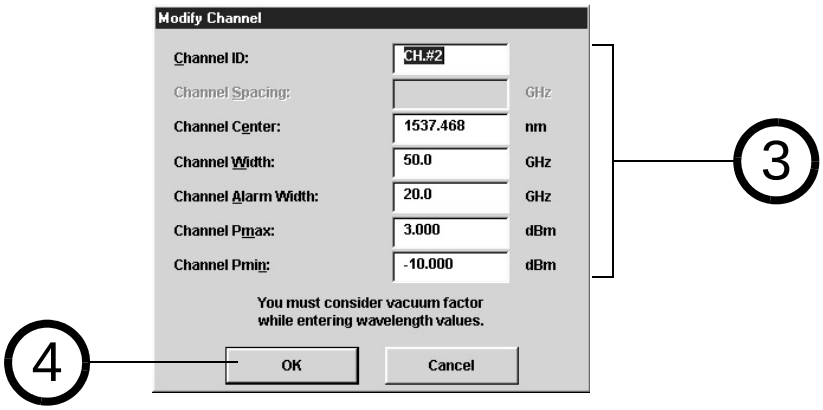


Figure 4-11. Modify Channel Window

Care must be taken to avoid overlapping channels. Two channels are said to overlap when they contain the same part of the spectrum. For example, when the lower limit (center - width/2) of a channel centered on 1552.5 nm is smaller than the upper limit (center + width/2) of a channel centered on 1550 nm, the channels overlap.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.3.3 Defining Channels with Equal Spacing

To define a number of channels having the same characteristics

1. Click on **Equal Spacing** in the **Channel** page. The *Regular Spacing* window appears.

2. Set the parameters that are common to all the regular spaced channels by filling in the appropriate text boxes.

3. When all the channel settings are defined, set the channel spacing to the appropriate value.

4. Click on the **OK** button. This will generate regularly spaced channels according to the set parameters. The channels will appear in the list of the **Channel** page.

4.3.4 Defining Channels on Currently Detected Peaks

To define channels based on currently detected peaks

1. Click on **Current Values** in the **Channel** page. The *Current Values* window will appear. Note that the **Channel ID**, **Channel Spacing** and **Channel Center** text fields are not active. This is normal, since these parameters are included in the acquired data.

2. To define the last four parameters of a channel, fill in the text boxes.

3. When all the channel settings are defined, click on **OK**. The new channel will appear in the list of the **Channel** page.

   Care must be taken to avoid overlapping channels. Two channels are said to overlap when they contain the same part of the spectrum. For example, when the lower limit (center - width/2) of a channel centered on 1552.5 nm is smaller than the upper limit (center + width/2) of a channel centered on 1550 nm., the channels overlap.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.3.5 Deleting a Channel

To delete a channel from the channel list

1. Select the channel to be deleted from the channel list.
2. Click on **Delete.** The *Delete Channel* window opens.
3. If the channel selected is the one you wish to delete, click on **Yes** in the *Delete Channel* window.

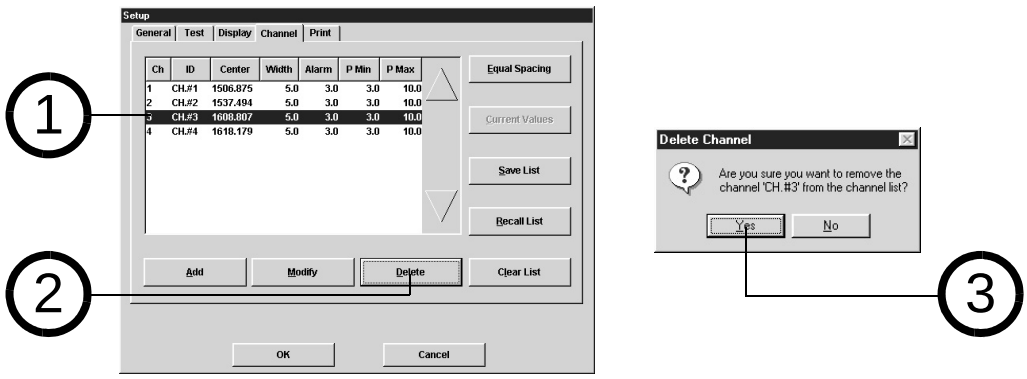


Figure 4-12. Delete Channel

4.3.6 Saving a List of Channels

To save a list of channels onto a disk

1. Click on **Save List** in the **Channel** Page.
2. Enter the name of the list in the **File name** text box.
3. Enter the destination path in the **Save in** text box.
4. Click on **OK** in the *Save File* window.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

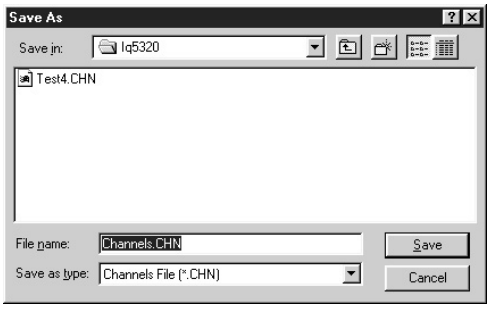


Figure 4-13. Save List Window

4.3.7 Recalling a List of Channels

To recall a list of channels from a disk

1. Click on **Recall List** in the **Channel** Page.
2. Find and select the file containing the list to be recalled.
3. Click on **OK** in the *Recall File* window.

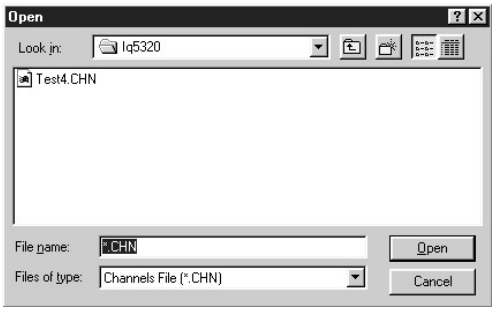


Figure 4-14. Open List Window

The channels listed in the selected file will appear in the channel list of the **Channel** page.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.4 Display Parameters

To set the display and color parameters of the graph, click on the **Display** tab in the *Setup* window.

4.4.1 Showing or Hiding Grid and Alarm Notifier

To show the grid in the graphic section, place a check mark in the **Show Grid** check box. The default is to show the grid.

To display the alarm notifiers " ! " throughout the application lists, place a check mark in the **Alarm Notifier** check box. By default, the alarm notifiers are not visible.

4.4.2 Setting color parameters

You can select colors for the

- curve
- bar
- grid
- background
- markers
- x-axis text
- y-axis text
- preview window

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

To set the color for the different parts of the graph listed in the list box of the **Display** page

1. Select an item in the list box.

2. Click on the **Colors** button.

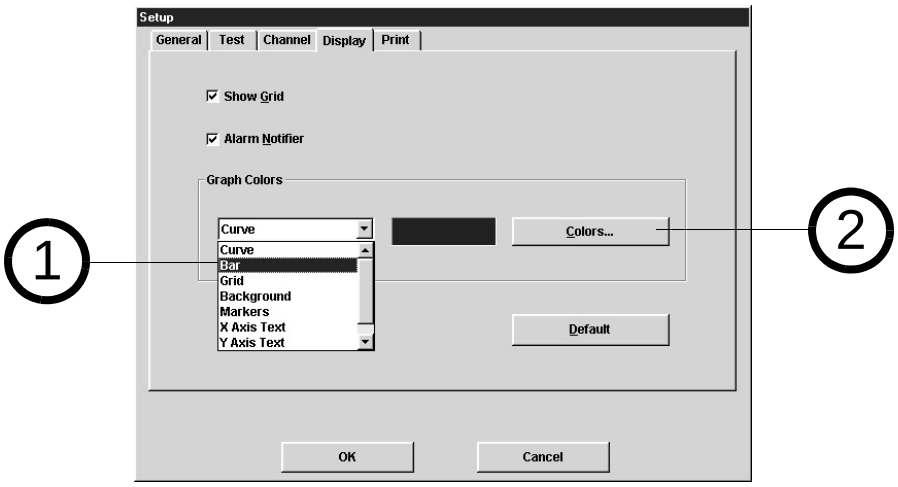


Figure 4-15. Setup Window: Display Page

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

3. To choose a basic color, click on the appropriate color box in the **Basic colors** palette.

   To choose a custom color, click on the appropriate color box in the **Custom colors** palette.

4. Click on **OK** of the *Color* window to activate the change in color. Click on **Cancel** to ignore changes in color and return to the **Display** page.

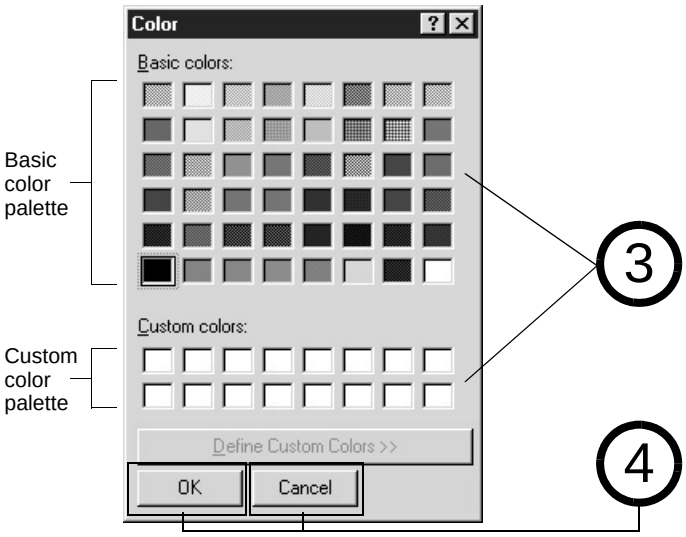


Figure 4-16. Display Page: Color Window

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.5 Use of Application Parameters

To close the *Setup* window and use the newly defined application parameters, click on **OK** at the bottom of the *Setup* window.

To close the *Setup* window without saving the changes made to the application parameters, click on **Cancel** at the bottom of the *Setup* window.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4.6 Storage of Application Parameters

To store application parameters in a configuration file

1. Click on **Save Config** in the *File* menu of the main window.

2. In the *Save Config* Window, select a file name and a destination.

3. Once the name and destination has been selected, click on **Save** in the *Save Config* window.

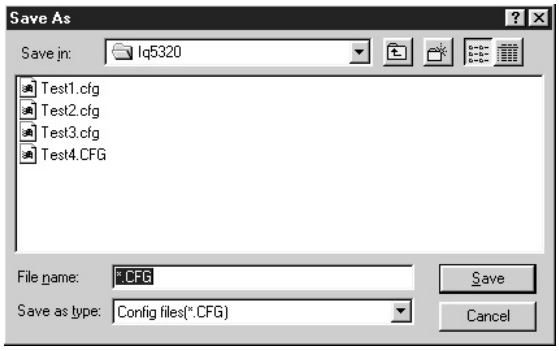


Figure 4-17. Save Config Window

The default directory is \Userfile\iq5320 and the default file name is DEFAULT.CFG. However, if the setup parameters come from a configuration file, the file name suggested will be the name of the file of origin.

The **Save as type** list contains the **Config Files** (*.CFG) format only.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

5 TAKING MEASUREMENTS IN MONITORING MODE

IMPORTANT

Before taking measurements, you should perform an offset nulling.

Use one of three monitoring modes to perform the test described in Table 5-1. This table also indicates the test parameters that you must set depending on the required test and the mode used.

Test Description	Mode Used	Parameters to Set
Continuous scanning	Continuous monitoring	If progressive average is desired, must set the number over which progressive averaging will take place
Eight scans, displaying average result, and stopping	Auto monitoring	none (the total number of scans is automatically set to eight)
User-defined number of scans, displaying average result, and stopping	Custom monitoring	required number of scans

Table 5-1. Tests and Monitoring Mode Used

5.1 Performing Offset Nulling

Internal electronic offsets are eliminated by nulling. An offset nulling must be performed at the beginning of each testing session, each time the IQ-5320 Multi-Wavelength Meter is powered on, or whenever environmental conditions change while the IQ-5320 is on.

To perform a nulling, click on **Null (F7)** in the main window.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

5.2 Setting Test Parameters

IMPORTANT

Before testing, make sure the parameters which determine the type of test that will be performed are appropriately defined.

Before testing in monitoring mode, you must set

- the required number over which progressive averaging will take place if you are testing in Monitoring Continuous Mode
- the required number of scans if you are testing in Monitoring Custom Mode

You may perform a test using either

- newly defined test parameters,
- test parameters used to obtain the trace presently displayed in the main window, or
- test parameters saved in a configuration file.

5.2.1 New Test Parameters

To set new monitoring mode test parameters

1. Click on **Setup** in the functions option page.
2. Open the **Test** page by selecting the **Test** tab.

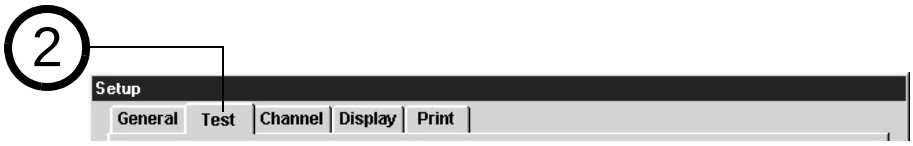


Figure 5-1. Setup Tabs

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Continuous Scanning

To perform a test with continuous scanning

1. Select the **Monitoring** radio button of the **Test** page.
2. Select the **Continuous** radio button.
3. Specify the number of scans over which the module will take progressive averages of the results in the **Nb Of Scans** text field.

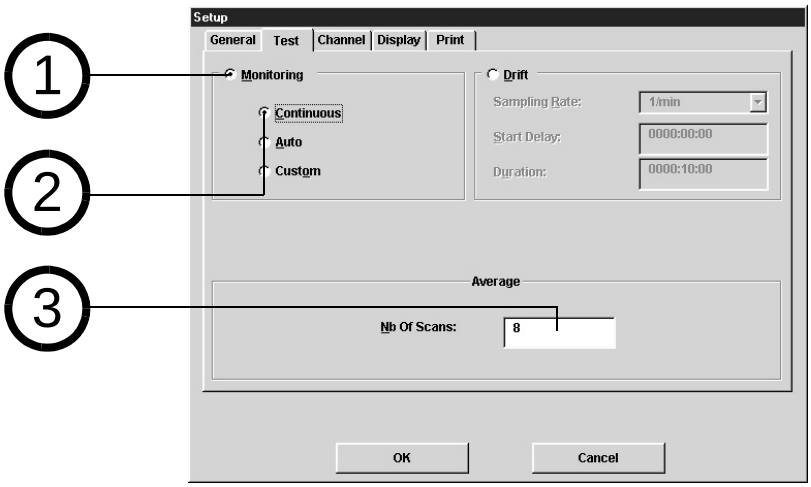


Figure 5-2. Test Page: Monitoring and Average Sections

Eight Scans, Displaying Average, and Stopping

To test using eight scans

1. Select the **Monitoring** radio button of the **Test** page.
2. Select the **Auto** radio button.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

User-Defined Number of Scans, Displaying Average Results

To test using a number of scans other than eight

1. Select the **Monitoring** radio button of the **Test** page.

2. Select the **Custom** radio button.

3. Specify the number of scans you wish the module to complete before stopping, in the **Nb Of Scans** text box.

5.2.2 Test Parameters Used to Obtain Displayed Trace

To test using the same application parameters that were used to obtain the trace currently displayed in the main window, or the last trace to have been displayed in the main window

1. Click on **Clear trace** in the *File* menu of the main window.

   If the trace and results have not been saved, you will be prompted to do so.

2. To save the trace and results resident in memory, click on **Yes** in the *File not saved* dialogue window.

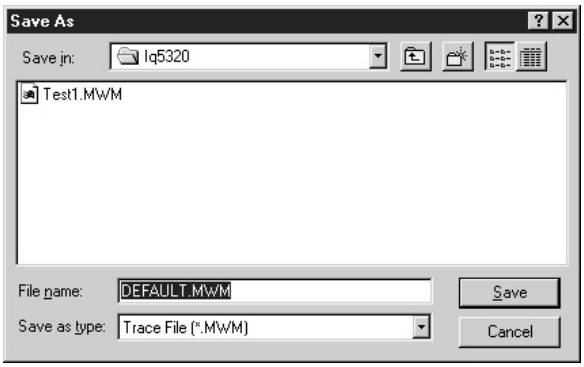


Figure 5-3. Save Trace Window

3. In the *Save As* Window, select a file name and a destination.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

4. Once the name and destination have been selected, click on **Save.** For more information on saving a trace, see *Saving a Trace*, on page 8-1.

Note: *Some of the display parameters, such as display colors, are not saved with the trace.*

5.2.3 Using Parameters Saved in a Configuration File

To test using application parameters stored in a configuration file

1. Select **Open Config** from the *File* menu of the main window.

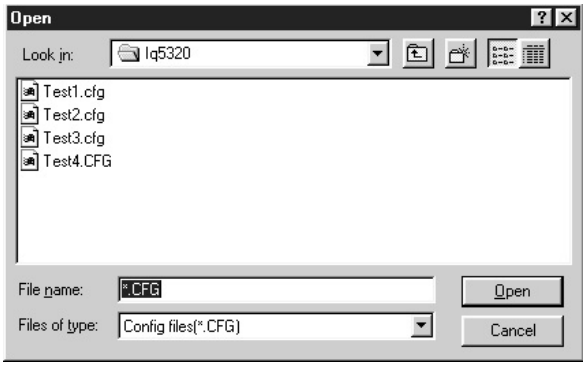


Figure 5-4. Open Config Window

2. In the *Open Config* Window, select the required source folder and file.

3. Once you have found and selected the file, click on **Open.**

4. Follow the steps in *New Test Parameters*, on page 5-2, to make sure that the settings in the **Test** page of the *Setup* window are the ones you want.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

5.3 Making Acquisition in Monitoring Mode

IMPORTANT

Before the scan starts, the IQ-5320 Multi-Wavelength Meter must stabilize to ensure precise measurements. An optical signal must be detected for this stabilization to occur correctly.

To start an acquisition in Monitoring Mode, click on **Start (F2).**

The status bar information panel on the far left displays **Waiting for stabilization**... Once the module is initialized, the status bar information panel will display **Scan in progress**..., indicating that the module is scanning.

In all Monitoring Modes, you may stop scanning at any time by clicking on **Stop.** The status bar information panel will then display **Scan stopped**.

If you are in Auto or Custom Monitoring Mode, the module will automatically stop scanning after the set number of scans is attained. The status bar information panel will then display **Scan completed**. In continuous monitoring mode, scanning will continue until you click on **Stop.**

Note: *You may view results and take measurements during an acquisition, as described in the following sections. You may also save a trace and make measurements on the results at a later time.*

5.4 Saving and Recalling Traces

It is possible to make several acquisitions and save the results to take measurements at a later time.

5.4.1 Saving a Trace

To save a trace resident in memory

1. Click on **Save trace** in the *File* menu of the main window.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

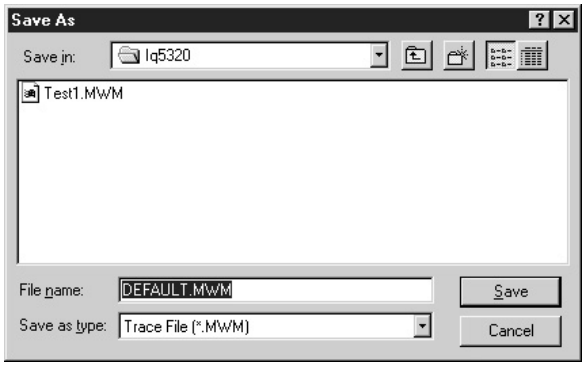


Figure 5-5. Save Trace Window

2. In the *Save As* Window, select a file name and a destination.

3. Once the name and destination have been selected, click on **Save.** For more information on saving a trace, see *Saving a Trace*, on page 8-1.

Note: *Not all application parameters are saved with the trace. For example, some of the display parameters are not saved with the trace.*

5.4.2 Recalling a Trace

To recall a trace in order to take measurements

1. Click on **Open trace** in the *File* menu.

2. In the *Open* window select the trace you wish to open.

3. Click on **Open.**

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

5.5 Viewing Channel Results

5.5.1 Viewing Channel Results Page

To view channel results, click on the **Results** tab.

Figure 5-6 depicts the **Results** page when the **Show Interchannel Data** box is not checked in the **General** page of the *Setup* window.

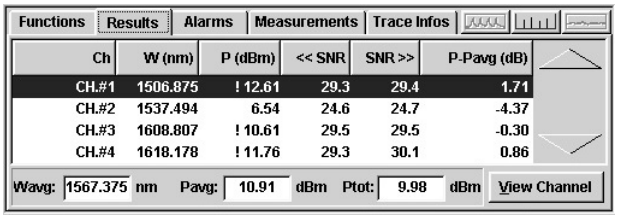


Figure 5-6. Results Page: No Interchannel Data

Figure 5-7 depicts the **Results** page when the **Show Interchannel Data** box is checked in the **General** page of the *Setup* window.

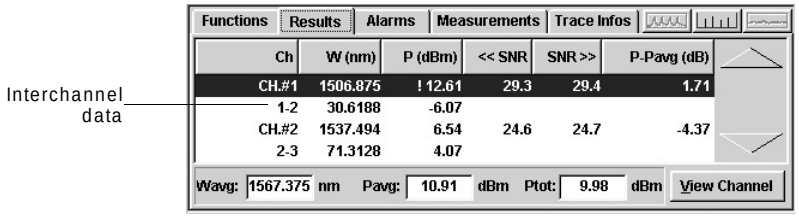


Figure 5-7. Monitoring Mode: Results Page

The **Results** page displays information as explained in Table 5-2.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Column Title	Displayed Information	Units
Ch	identification of defined channel in which peak is found[a] a pair of numbers in the format "1-2" indicates interchannel data between channels 1 and 2	none
• **W(nm)** if current wavelength unit is nm • **F(THz)** if current wavelength unit is THz	detected peak wavelength[b]	current wavelength unit (nm or THz)
• **P(dBm)** if current power unit is dBm • **P(W)** if current power unit is W	detected peak power[c]	current power unit (dBm or W)
<< SNR	channel SNR to the left of the channel peak	• dB if power unit is dBm • ratio $^{peak}/_{noise}$ if power unit is W
SNR >>	channel SNR to the right of the channel peak	

Table 5-2. Monitoring Mode: Contents of Results Page (Part 1 of 2)

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Column Title	Displayed Information	Units
If power reference is Pavg: • **P-Pavg(dBm)** if current power unit is dBm power reference is Pavg • **P-Pavg(W)** if current power unit is W and power reference is Pavg	difference between peak power and average power	current power units (dBm or W)
If power reference is Ppeak: • **P-Ppeak(dBm)** if current power unit is dBm power reference is Pavg • **P-Ppeak(W)** if current power unit is W and power reference is Pavg	difference between peak power and power of strongest peak	
If power reference is Pn: • **P-Pn(dBm)** if current power unit is dBm power reference is Pavg • **P-Pn(W)** if current power unit is W and power reference is Pavg	difference between peak power and power of peak number n	

Table 5-2. Monitoring Mode: Contents of Results Page (Part 2 of 2)

a. The absence of a number or name in a row of this column indicates that the corresponding peak is not within any defined channel limits.
b. An exclamation mark to the right of a wavelength value indicates that it is not within alarm limits.
c. An exclamation mark to the right of a power value indicates that it is not within alarm limits.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Wavg in nm (**Favg** if unit is THz), **Pavg** in dBm or W, and **Ptot** in dBm or W are displayed below the channel list to the left of the **View Channel** button. These are defined as follows:

Quantity	Definition
Wavg	$\left(\sum_{i=1}^{n} P_i \lambda_i\right) / \left(\sum_{i=1}^{n} P_i\right)$
Pavg	$\left(\sum_{i=1}^{n} P_i\right) / n$
Ptot	Total signal power

Table 5-3. Definitions: Wavg. Pavg, and Ptot

5.5.2 Viewing Channel Information

To view information for a specific channel

1. Select the channel you wish to view from the channel list of the **Results** page.

2. Click **View Channel** on the **Results** page. The following display will appear in place of the channel list.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

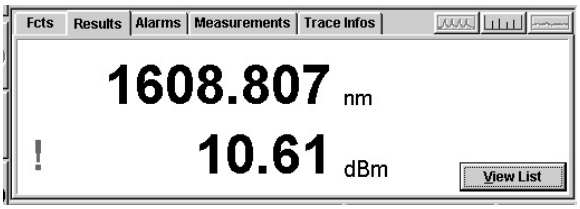


Figure 5-8. Results Page: View Channel

The exclamation mark, " **!** " indicates that the selected channel's power level is not within alarm limits. A similar exclamation mark would appear next to the wavelength if the peak was within the defined channel but outside the alarm range.

3. To view the next channel in the channel list, click on **Next.** To view the previous channel in the channel list, click on **Previous.**

4. To return to the list of channels, click on **View List.**

5.6 Viewing Alarms

To view alarms, click on the **Alarms** tab.

A list of the channels for which the alarm has been triggered is found in the **Alarms** page. A " **!** " appears next to these channels in the **Results** page.

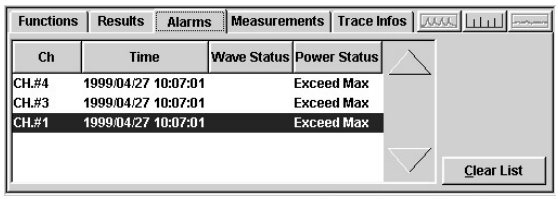


Figure 5-9. Alarms Page

To clear the alarms list, click on **Clear List** in the bottom right-hand corner.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

5.7 Viewing Measurement Results

To view measurements, open the **Measurements** page by clicking on the **Measurements** tab. The results bound by markers A and B are displayed here.

When the bar graph display is selected, the wavelength and power values of the peaks at which the markers are located are displayed. For more information, see *Using Markers*, on page 5-14.

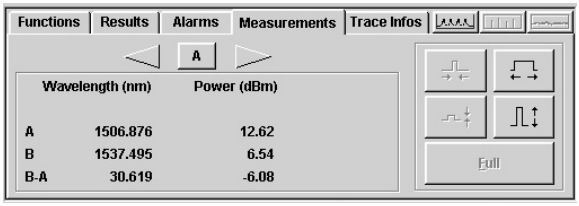


Figure 5-10. Measurements Page with Bar Graph Selected

When the curve graph display is selected, the wavelength values of the peaks at which the markers are located are displayed, along with the **Differential Power** and the **Integrated Power**.

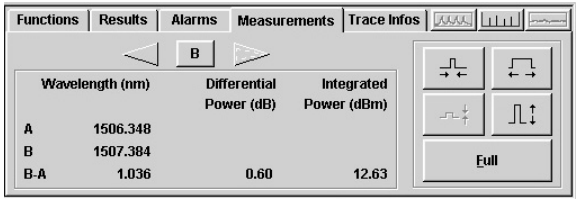


Figure 5-11. Measurements Page with Curve Graph Selected

The **Differential Power** is the difference in power between the two markers. When power is in watts, the differential power is expressed as the ratio of the greatest power over the smallest power. When power is in dBm, the differential power is expressed in dB.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

The **Integrated Power** is the sum of each trace point contained between the two markers. The calculation does not take into account the points not included in the optical power distribution.

For more information on the graph display options, see *Selecting Type of Graph*, on page 5-16.

5.7.1 Using Markers

To place markers A and B

1. Drag them to their general location on the graph with the mouse.

2. Click on the button found between the arrow buttons to select the marker you wish to place with precision. The letter displayed on this button identifies the marker moved by the arrow buttons.

3. Use the left and right arrow buttons in the center of the **Measurements** page to move the markers along the trace.

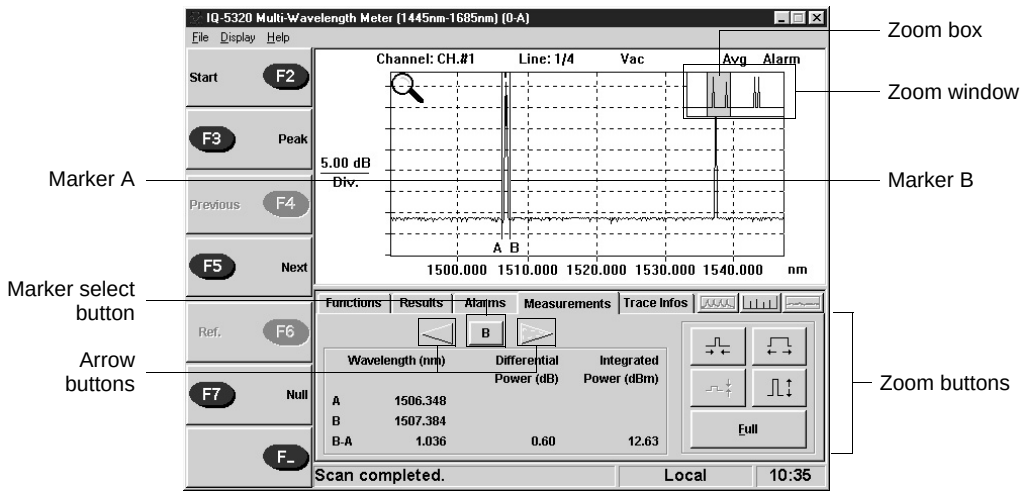


Figure 5-12. Measurements Page

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

The spectral values of the markers are displayed in the measurements page beneath the marker select and arrow buttons.

5.7.2 Using Zoom Buttons

To zoom in and out on a portion of the trace

1. Place the magnifying glass over the portion of the trace you wish to magnify.



Figure 5-13. Magnifying Glass

2. To zoom in on the trace

   - click on  to enlarge the trace horizontally (or reduce horizontal scale)
   - click on  to enlarge the trace vertically (or reduce vertical scale)

   To zoom out of the trace

   - click on  to reduce the trace horizontally (or enlarge horizontal scale)
   - click on  to reduce the trace vertically (or enlarge vertical scale)

   To restore the default vertical and horizontal scale settings, click on 

.

The portion of the trace that is magnified and displayed in the graphical display section is covered by the zoom box in the zoom window.

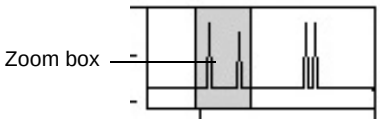


Figure 5-14. Zoom Window

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

5.8 Selecting Type of Graph

Results acquired in monitoring mode are displayed as a graph of power vs. wavelength and are displayed either as a bar graph or as a curve graph with peaks.

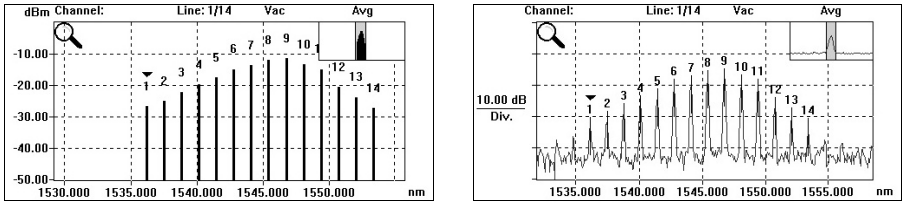


Figure 5-15. Monitoring Mode: Bar and Curve Graphs

To choose the type of graph, click on the appropriate graphic type button in the top left corner of the **Results** page.



Figure 5-16. Monitoring Mode: Graphic Type Selection Buttons

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

5.9 Viewing Trace Information

Note: *The* **Trace Infos** *tab is only present once acquisition is completed or stopped.*

To view general trace information, click on the **Trace Infos** tab.

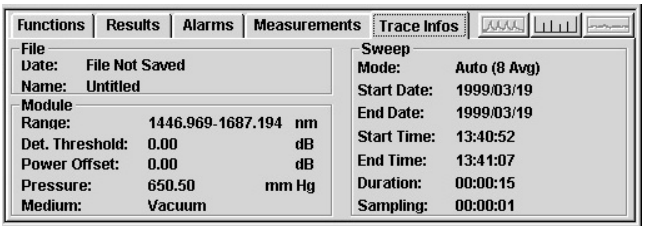


Figure 5-17. Trace Information Page

All information pertains to the trace currently displayed in the graph section of the main window.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6 TAKING MEASUREMENTS IN DRIFT MODE

IMPORTANT

Before taking measurements, you should perform an offset nulling.

Use drift mode to perform the type of test described in Table 6-1. This table also indicates the test parameters that you must set to test in drift mode.

Test Description	Parameters to Set
Long-term drift measurements	• sampling rate • duration of drift test • start delay • number of scans averaged at each sampling point • channel definitions

Table 6-1. Drift Mode Test

Note: *A Drift Mode acquisition cannot be taken without a list of predefined channels. A peak which is not within a defined channel will not be monitored in Drift Mode. Also, only the strongest peak in a channel is monitored. You must define the channels via the* **Channel** *page, as described in Channel Parameters, on page 4-11.*

6.1 Performing Offset Nulling

Internal electronic offsets are eliminated by nulling. An offset nulling must be performed at the beginning of each testing session, each time the IQ-5320 Multi-Wavelength Meter is powered on, or whenever environmental conditions change while the IQ-5320 is on.

To perform a nulling, click on **Null (F7)** in the main window.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6.2 Setting Test Parameters

IMPORTANT

Before testing, make sure the parameters which determine the type of test that will be performed are appropriately defined.

Before testing in drift mode, you must set

- the sampling rate, which determines the frequency of the scans
- the start delay, which determines the time before the scans will start
- the duration of the testing
- the channel parameters

You may perform a test using either

- newly defined test parameters,
- test parameters used to obtain the trace presently displayed in the main window, or
- test parameters saved in a configuration file.

6.2.1 New Test Parameters

To set new drift mode test parameters

1. Click on **Setup** in the functions option page.
2. Open the **Test** page by selecting the **Test** tab.

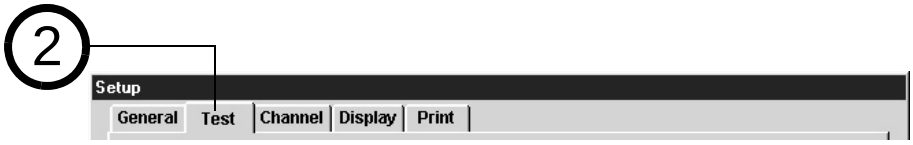


Figure 6-1. Setup Tabs

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

3. Click on the **Drift** radio button of the **Test** page.

4. Select the appropriate value from the **Sampling Rate** list box.

   To edit a sampling rate, click in the list box and type in the rate. It must be expressed as 1/x sec, 1/x min, or 1/x h, for some positive integer x. The last edited sampling rate is stored in the list.

5. Fill in the other two parameter text fields as indicated by the forced time format, **hhhh : mm : ss**.

6. Set the number of scans averaged at each sampling point in the **Nb of Scans** list box.

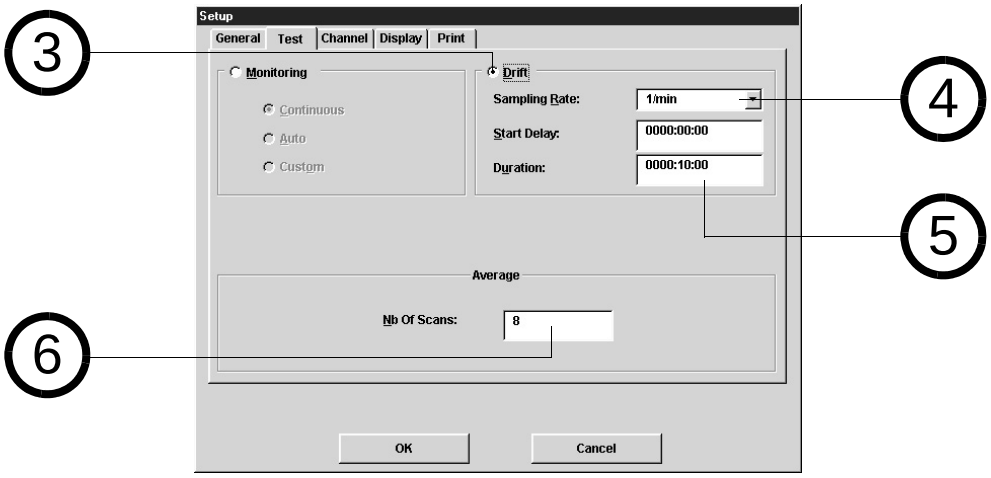


Figure 6-2. Setup Window: Test Page

7. Define the channels in the **Channel** page as described in *Channel Parameters*, on page 4-11.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Note: *The* **Duration** *must be greater than the period between two samples. For example, if the* **Sampling Rate** *is set at 1/20min, the test duration must be greater than 20 minutes. Also, the* **Nb of Scans** *(average) must be smaller than the* **Sampling Rate** *by approximately 10 due to the stabilizing time. For example, for a* **Sampling Rate** *of 1/min, the maximum* **Nb of Scans** *permitted will be 60.*

6.2.2 Test Parameters Used to Obtain Displayed Trace

To test using the same application parameters that were used to obtain the trace currently displayed in the main window, or the last trace to have been displayed in the main window

1. Click on **Clear trace** in the *File* menu of the main window.

   If the trace and results were not previously saved, you will be prompted to do so.

2. To save the trace and drift data resident in memory, click on **Yes** in the *File not saved* dialogue window.

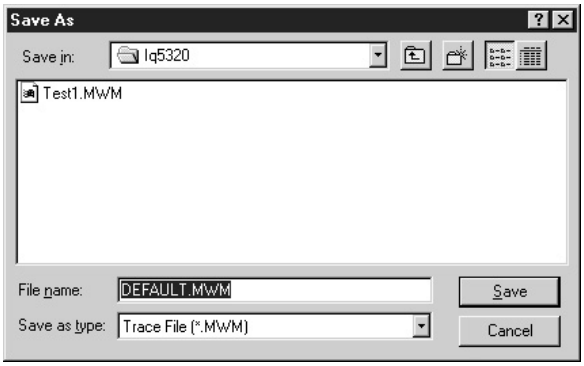


Figure 6-3. Save Trace Window

3. In the *Save As* window, select a file name and a destination.

4. Once the name and destination have been selected, click on **Save.** For more information on saving a trace, see *Saving a Trace*, on page 8-1.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Note: *Some of the display parameters, such as display colors, are not saved with the trace.*

5. Follow the steps in *New Test Parameters*, on page 6-2 to make sure the settings in the **Test** page of the *Setup* window are the ones you want.

6.2.3 Using Parameters Saved in a Configuration File

To test using application parameters stored in a configuration file

1. Select **Open Config** from the *File* menu of the main window.

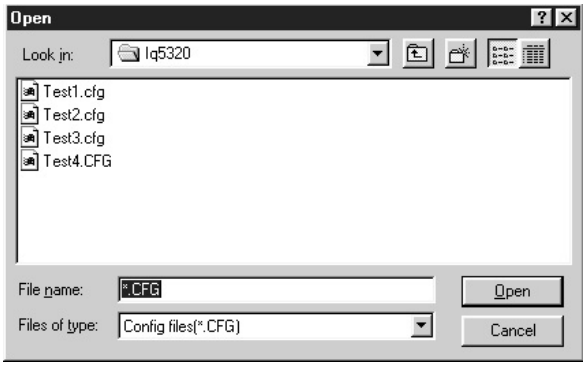


Figure 6-4. Open Config Window

2. In the *Open Config* Window, select the required source folder and file.

3. Once you have found and selected the file, click on **Open.**

4. Define the channels in the **Channel** page as described in *Channel Parameters*, on page 4-11.

5. Follow the steps in *New Test Parameters*, on page 6-2 to make sure the settings in the **Test** page of the *Setup* window are the ones you want.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6.3 Making Acquisition in Drift Mode

IMPORTANT

Before the scan starts, the IQ-5320 Multi-Wavelength Meter must stabilize to ensure precise measurements. An optical signal must be detected for this stabilization to occur correctly.

Note: *A Drift Mode acquisition cannot be taken without a list of predefined channels. A peak which is not within any defined channel will not be monitored in Drift Mode. Also, only the strongest peak in a channel is monitored. You must define the channels via the* **Channel** *page, as described in Channel Parameters, on page 4-11.*

To start an acquisition in Drift Mode using the programmed sampling rate, click on **Start (F2)**.

The status bar information panel displays **Waiting for stabilization...** Once the module has been initialized, the status bar information panel will display **Scan in progress...**, indicating that the module is scanning.

At any moment, scanning can be stopped by clicking on **Stop**. The status bar information panel will then display **Scan stopped**.

If you do not stop scanning manually, the module will automatically stop scanning after the set duration has elapsed. The status bar information panel will then display **Scan completed**.

Note: *You may view results and take measurements during an acquisition, as described in the following sections. You may also save a trace and make measurements on the results at a later time.*

6.4 Saving and Recalling Traces

It is possible to make several acquisitions and save the results to take measurements at a later time.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6.4.1 Saving a Trace

To save a trace and results data resident in memory

1. Click on **Save trace** in the *File* menu of the main window.

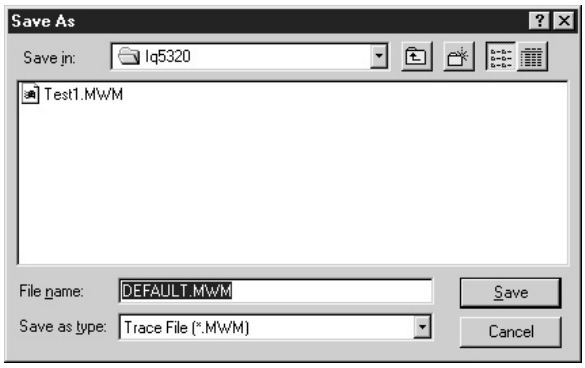


Figure 6-5. Save Trace Window

2. In the *Save As* window, select a file name and a destination.

3. Once the name and destination have been selected, click on **Save.** For more information on saving a trace, see *Saving a Trace*, on page 8-1.

Note: *Not all application parameters are saved with the trace. For example, some of the display parameters are not saved with the trace.*

6.4.2 Recalling a Trace

To recall a trace in order to take measurements

1. Click on **Open trace** in the *File* menu.

2. In the *Open* window select the trace you wish to open.

3. Click on **Open.**

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6.5 Viewing Channel Results

6.5.1 Viewing Channel Results Page

To view channel results, click on the **Results** tab.

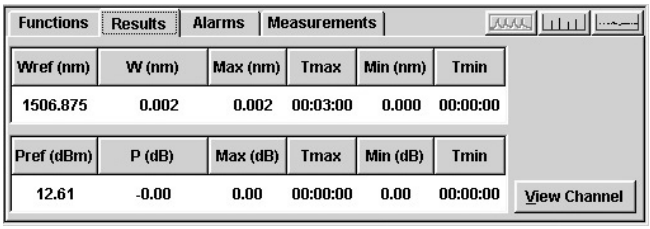


Figure 6-6. Drift Mode: Results Page

This page displays the information as explained in the following table.

Column Title	Displayed Information	Units
• **Wref(nm)** if current wavelength unit is nm • **Fref(THz)** if current wavelength unit is THz	peak wavelength at beginning of drift mode acquisition, or at the moment you last clicked **Ref.(F6)**	current wavelength unit (nm or THz)
• **W(nm)** if current wavelength unit is nm • **F(THz)** if current wavelength unit is THz	• during an acquisition, difference between **Wref(nm)** (or **Fref(THz)**) and wavelength at moment of last acquisition sweep • after an acquisition, difference between **Wref(nm)** (or **Fref(THz)**) and wavelength at position of marker A[a] on the top trace	current wavelength unit (nm or THz)

Table 6-2. Drift Mode: Contents of Results Page (Part 1 of 3)

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Column Title	Displayed Information	Units
• **Max(nm)** if current wavelength unit is nm • **Max(THz)** if current wavelength unit is THz	maximum wavelength attained during the whole acquisition, or up to the current time	current wavelength unit (nm or THz)
• **Max(dB)** if current power unit is dB • **Max(mW)** if current power unit is watts	maximum power attained during the whole acquisition, or up to the current time	current power unit (dBm or W)
Tmax	time at which maximum wavelength was attained	hhhh:mm:ss
• **Min(nm)** if current wavelength unit is nm • **Min(THz)** if current wavelength unit is THz	minimum wavelength attained during the whole acquisition, or up to the current time	current wavelength unit (nm or THz)
• **Min(dB)** if current power unit is dB • **Min(mW)** if current power unit is watts	minimum power attained during the whole acquisition, or up to the current time	current power unit (dBm or W)
Tmin	time at which minimum wavelength was attained	hhhh:mm:ss
• **Pref(dBm)** if current power unit is dBm • **Pref(W)** if current power unit is watts	peak power at beginning of drift mode acquisition, or at the moment you last clicked **Ref.(F6)**	current power unit (dBm or mW)

Table 6-2. Drift Mode: Contents of Results Page (Part 2 of 3)

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Column Title	Displayed Information	Units
• **P(dBm)** if current power unit is dBm • **P(mW)** if current power unit is watts	• during acquisition, difference between **Pref(dBm)** (or **Pref(W)**) and power at moment of last acquisition sweep • after an acquisition, difference between **Pref(dBm)** (or **Pref(W)**) and power position of marker A[a] on the top trace	current power units (dBm or W)

Table 6-2. Drift Mode: Contents of Results Page (Part 3 of 3)

a. Marker A is only present after the acquisition is complete.

6.5.2 Setting Current Wavelength and Power as Reference

It is possible to set the wavelength and power references from the current wavelength and power values during or after an acquisition.

To set new wavelength and power references from **W(nm)** (or **F(THz)**) and **P(dB)** (or **P(mW)**), click on **Ref. (F6).**

- If set during an acquisition, the new wavelength and power references will take on the values of **W(nm)** (or **F(THz)**) and **P(dB)** (or **P(mW)**) of the last scan.
- If set after an acquisition, the new wavelength and power references will take on the values of **W(nm)** (or **F(THz)**) and **P(dB)** (or **P(mW)**), which in turn depend on the position of marker A on the drift graph.

6.5.3 Viewing Information for Specific Channel

To view the information for a specific channel

1. Select the channel using the **Next** and **Previous** buttons.
2. Click **View Channel** in the **Results** page. The following display will appear in place of the channel list.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

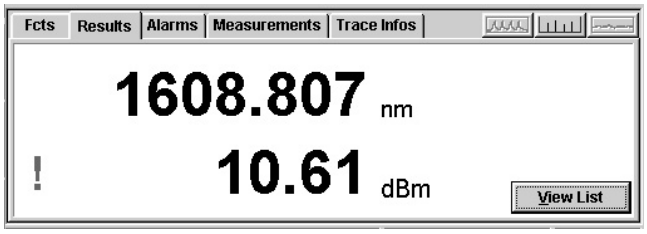


Figure 6-7. Results Page: View Channel

The exclamation mark, " **!** " indicates that the selected channel's power level is not within alarm limits. A similar exclamation mark would appear next to the wavelength if the peak was within the defined channel but outside the alarm range.

3. To view the next channel in the channel list, click on **Next.**

   To view the previous channel in the channel list, click on **Previous.**

4. To return to the list of channels click on **View List.**

6.6 Viewing Alarms

To view alarms, click on the **Alarms** tab.

A list of the channels for which the alarm has been triggered, and next to which a " **!** " appears, is found in the **Alarms** page.

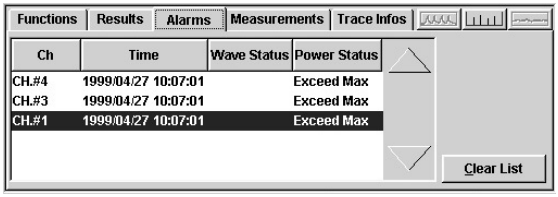


Figure 6-8. Alarms Page

To clear the alarms list, click on **Clear List** at the bottom right-hand corner.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6.7 Viewing Measurement Results

To view measurements, open the **Measurements** page by clicking on the **Measurements** tab. The results bound by the markers A and B are displayed here.

6.7.1 Using Markers

To place markers A and B

1. Drag them to their general location on the graph with the mouse.

2. Click on the button located between the arrow buttons to select the marker you wish to place with precision. The letter displayed on this button identifies the marker moved by the arrow buttons.

3. Use the left and right arrow buttons in the center of the **Measurements** page to move the markers along the trace.

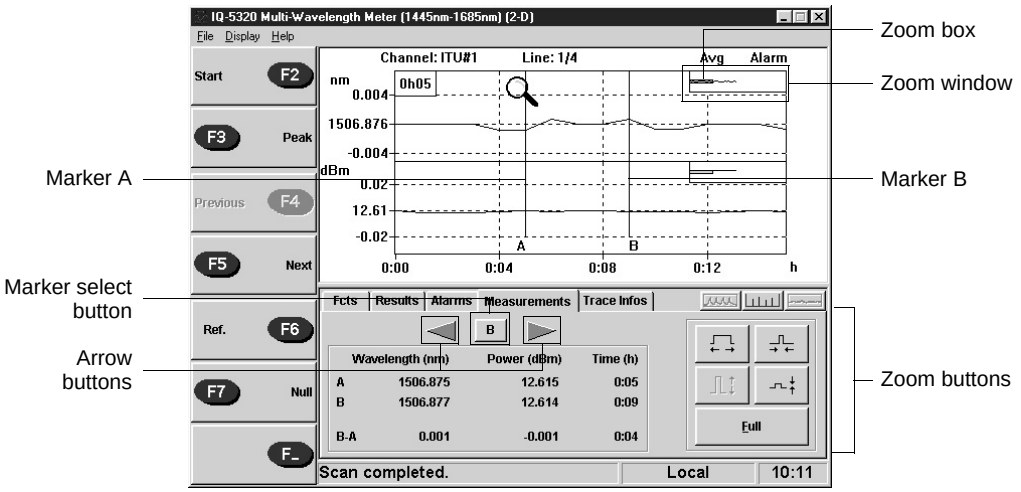


Figure 6-9. Measurements Page

The spectral values of the markers and the time value of marker A are displayed in the measurements page beneath the marker select and arrow buttons.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6.7.2 Using Zoom Buttons

To zoom in and out on a portion of the trace

1. Place the magnifying glass over the portion of the trace you wish to magnify.



Figure 6-10. Magnifying Glass

2. To zoom in on the trace

   - click on  to enlarge the trace horizontally (or reduce horizontal scale)
   - click on  to enlarge the trace vertically (or reduce vertical scale)

   To zoom out of the trace

   - click on  to reduce the trace horizontally (or enlarge horizontal scale)
   - click on  to reduce the trace vertically (or enlarge vertical scale)

   To restore the default vertical and horizontal scale settings, click on .

The portion of the trace that is magnified and displayed in the graphical display section is covered by the zoom box in the zoom window.



Figure 6-11. Zoom Window

Note: *When viewing a drift graph, the horizontal zoom buttons affect both the graphs.*

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6.8 Selecting Type of Graph

Results acquired in drift mode are displayed as a graph of

- power vs. time
- wavelength vs. time

They are displayed as curves, one above each other.

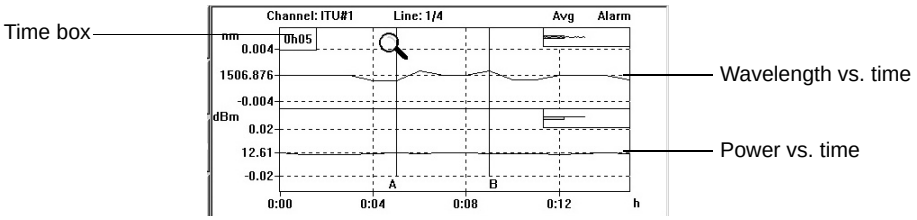


Figure 6-12. Drift Mode: Drift Graph

The time box in the top left corner of the graph display section gives the time corresponding to the position of marker A on the drift traces.

As in Monitoring Mode, the power vs. wavelength trace can also be displayed, either as a bar graph or as a curve with peaks, as depicted in Figure 5-15, on page 5-16.

To choose the type of graph, click on the appropriate graphic type button above the top left corner of the **Results** page.

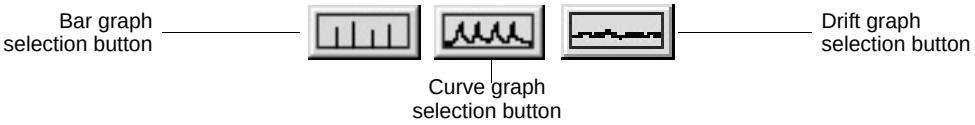


Figure 6-13. Drift Mode: Graph Selection Buttons

Note: *The drift graph button is not activated unless results are acquired in drift mode. Only the last acquisition performed is displayed in the bar or curve graph trace display types.*

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

6.9 Viewing Trace Information

Note: *The* **Trace Infos** *tab is only present once acquisition is completed or stopped.*

To view general trace information, click on the **Trace Infos** tab.

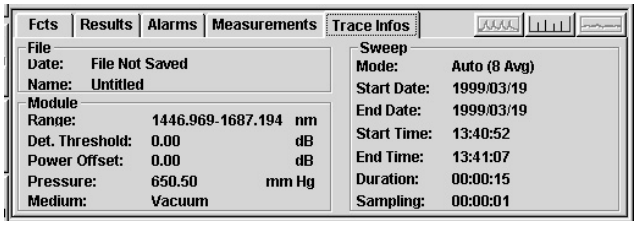


Figure 6-14. Trace Information Page

All information pertains to the trace currently displayed in the graph section of the main window.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

7 GENERATING AND PRINTING A REPORT

To generate a report on the results, click on **Report** in the **Fcts** options page.

7.1 Defining Report Parameters

7.1.1 Device Under Test

To enter information on the device under test (DUT)

1. Click on the **DUT** tab in the *Report* window

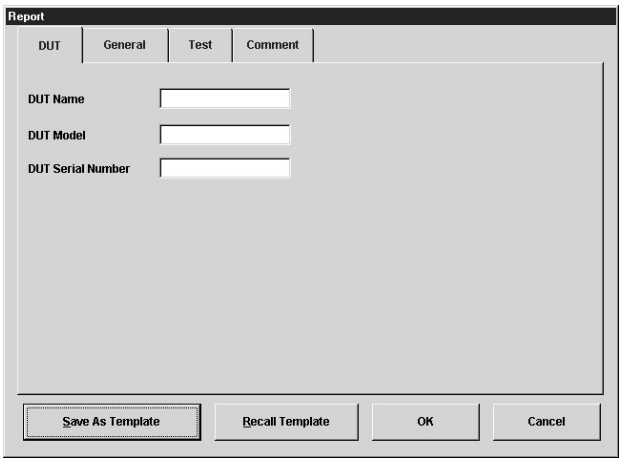


Figure 7-1. Report Window: DUT Page

2. To set the DUT name, model, or serial number, fill in the corresponding text fields in the **DUT** page.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

7.1.2 General

To enter general information

1. Click on the **General** tab in the *Report* window.

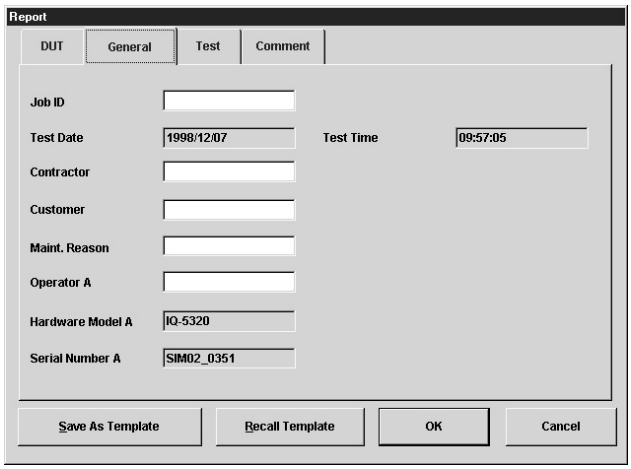


Figure 7-2. Report Window: General Page

2. To enter information relating to job ID, contractor, customer, maintenance reason, and operator, fill in the appropriate text fields in the **General** page.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

7.1.3 Test

To view the test parameters that will appear in the report, click on the **Test** tab in the *Report* window.

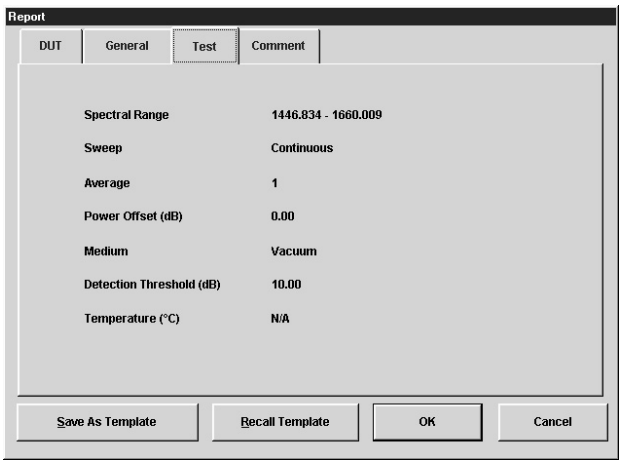


Figure 7-3. Report Window: Test Page

This page displays the following measurement parameters in use, as they will appear in the report:

- spectral range
- sweep
- average
- power offset
- medium
- detection threshold (in the current unit)
- temperature

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

7.1.4 Comments

To include comments in the report

1. Click on the **Comment** tab in the *Report* window.

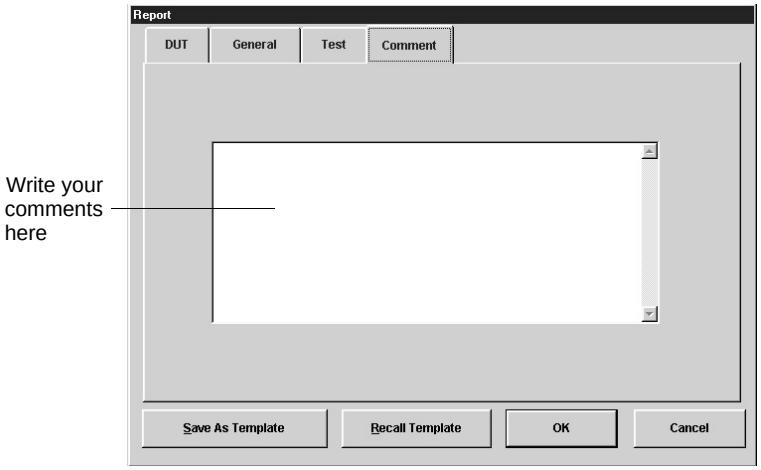


Figure 7-4. Report Window: Comment Page

2. Click anywhere in the comment text box to enter comments.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

7.2 Using the Report Template

You can save a report as a template containing information that is common to several measurement results and recall the template at a later time.

7.2.1 Creating a Report Template

To create a report template

1. Enter the appropriate text fields as indicated in *Defining Report Parameters*, on page 7-1.

2. Click on **Save as Template** at the bottom of the *Report* window.

   A message window displays **Save this setting as template?**

3. Click on **OK**.

7.2.2 Recalling a Report Template

To recall a previously defined report template

1. Click on **Recall Template** in the *Report* window.

   A message window displays **All information will be lost** indicating that any unsaved information contained in the Report fields will be permanently lost when replaced by the information contained in the template.

2. Click on **OK** in this window.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

7.3 Closing Report Window

To keep the changes made to the new report, click on **OK** in the *Report* window. The next time you return to the report within the same work session, it will be as you left it.

To ignore any changes made to the report, click on **Cancel** in the *Report* window.

When you save a trace, the report associated with it is also saved.

IMPORTANT

If you close the application without saving the report as template or saving the trace it is associated to, all changes will be lost.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

7.4 Setting Report Print Parameters

To set the Multi-Wavelength Meter report print parameters

1. Click on **Setup** in the **Fcts** options page to open the **Setup** page.

2. Click on the **Print** tab of the **Setup** page.

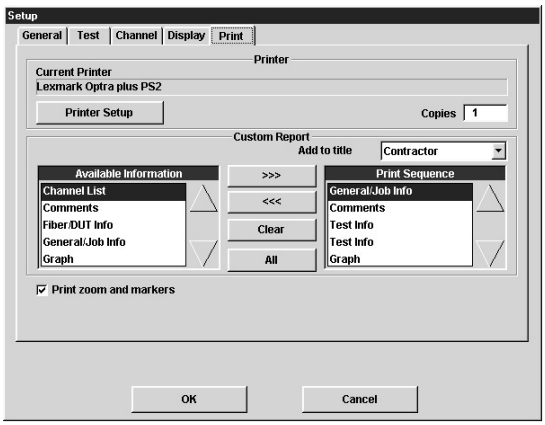


Figure 7-5. Setup Window: Print Page

7.4.1 Setting the Number of Copies

To change the number of copies to print, simply click on the **Copies** text field and type the number of copies to print.

7.4.2 Selecting Report Information

From the **Custom Report** section of the **Print** page, you can choose which data to include in the Multi Wavelength Meter report.

1. From the **Available Information** list, select the sections to include in the report.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

2. Use the **>>>**, **<<<**, **Clear**, or **All** buttons to move the chosen sections to the **Print Sequence** list.

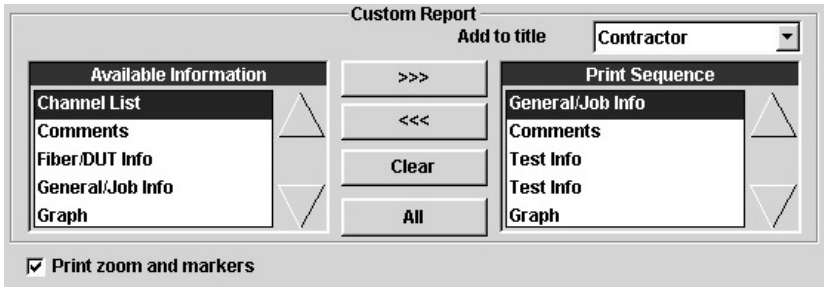


Figure 7-6. Print Page: Custom Report Section

The sections will print in the same order as they appear in the **Print Sequence** list.

7.4.3 Printing Zoom and Markers

The way the trace display will be printed in the report depends on the graph type displayed in the main window at the moment printing is launched. However, unless the **Print zoom and markers** check box is selected, the full trace display will be printed regardless of the zoom selected at the moment printing is launched.

To print the magnified portion of the trace along with the markers and marker information, select the **Print zoom and markers** check box.

7.4.4 Selecting a Printer and Setting Printer Parameters

The **Print Setup** window allows you to select a printer and to set the printer parameters. To access the **Print Setup** window click on **Printer Setup** in the **Print** page.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

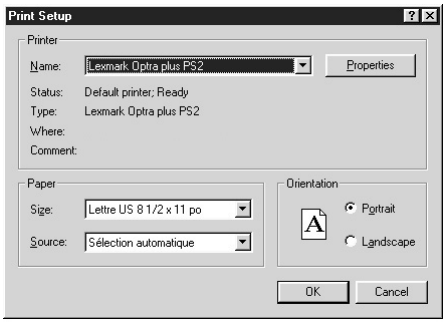


Figure 7-7. Print Setup Window

Selecting a Printer

1. Choose the printer you want to use in the *Name* list box of the **Printer** section. All installed printers appear in the list box.

2. Click on **OK**.

   To set the various printer options, click on **Properties**. These options vary with the selected printer. Refer to the documentation that came with your printer.

Setting Paper Size

1. Choose the desired paper size in the **Size** list box of the **Paper** section. All the paper sizes available for the selected printer appear in the list box.

2. Click on **OK**.

Setting Paper Source

1. Choose the desired paper source from the **Source** list box of the **Paper** section. All the paper sources available for the selected printer appear in the list box.

2. Click on **OK**.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Setting Paper Orientation

1. Choose the desired paper orientation in the **Orientation** section: **Portrait** or **Landscape**.

2. Click on **OK**.

7.5 Printing Report

To print a report

1. Set the print parameters as described in *Setting Report Print Parameters*, on page 7-7.

2. Click on **Quick print** in the **Fcts** options page.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

8 SAVING

At any time, it is possible to save a trace resident in memory along with the setup parameters in use, or to save the setup parameters alone.

8.1 Saving a Trace

Note: *Not all application parameters are saved with the trace. For example, some of the display parameters are not saved with the trace.*

To save a trace and drift data resident in memory

1. Click on **Save Trace** in the *File* menu of the main window.

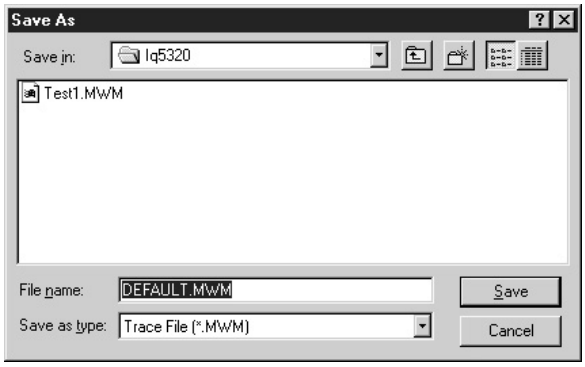


Figure 8-1. Save Trace Window

2. In the *Save As* window, select a file name and a destination.

3. Once the name and destination have been selected, click on **Save.**

The default directory is \Userfile\iq5320 and the default file name is DEFAULT.MWM.

The **Save as type** list contains the **Trace Files** (*.MWM) format.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Note: *The trace file is compatible with the software for the FTB-5320 module.*

The setup parameters and the report associated with the trace will be saved with the trace.

8.2 Saving Application Parameters

To store application parameters in a configuration file

1. Click on **Save Config** in the *File* menu of the main window.
2. In the *Save Config* window, select a file name and a destination.
3. Once the name and destination has been selected, click on **Save.**

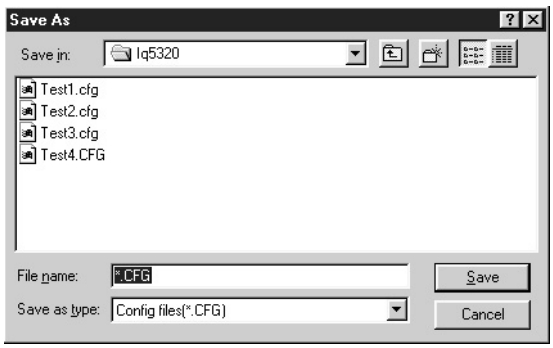


Figure 8-2. Save Config Window

The default directory is \Userfile\iq5320 and the default file name is DEFAULT.CFG. However, if the setup parameters come from a configuration file, the file name suggested will be the name of the file of origin.

The **Save as type** list contains the **Config Files** (*.CFG) format only.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

9 GPIB COMMANDS

9.1 Command Structure

The GPIB commands follow the guidelines determined by the Standard-Commands-for-Programmable-Instruments (SCPI) consortium. For example, the command syntax

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

is used to change the measurement display resolution (number of digits after the decimal point) of a given module.

In this particular example,

- FORM identifies that the command is part of the SCPI FORMat subset of commands
- (0..26) is a whole number between 0 and 26 that identifies the module
- READ and DATA are keywords that define the function of the command
- [ ] indicates that a keyword or parameter is optional
- <space> is included to indicate that a space is required
- <digit> is the command parameter

All keywords must be CAPITAL characters separated by a colon. A typical command would be

FORM4:READ:DATA 1

This command instructs the module to display a power measurement with 1 digit after the decimal point.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

9.2 Common Commands

The IQ-5320 recognizes all common commands identified as mandatory by IEEE-488.2. Table 9-1 summarizes these commands as well as some optional ones.

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
*TRG	Trigger Command (Not supported)
*TST?	Self test query
*WAI	Wait to Continue Command (Not supported)

Table 9-1 Common Commands Summary

The common commands are explained in detail on the following pages.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

*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, the Standard Event Status Enable Register (ESE), and the Service Request Enable Register (SRE) are not affected.

Syntax *CLS

Note The CLR command is equivalent to the *CLS command. Both give the same result.

*CSB

Description This command clears the status byte to zero.

Syntax *CSB

*ESE

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

Syntax *ESE<space><value>

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

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

*ESE?

Description This query extracts the content of the Events Status Register.

Syntax *ESE?

Response Binary integer with a value set between 0 and 255.

*ESR?

Description This query extracts the content of the Standard Events Register.

Syntax *ESR?

Response Binary integer with a value set between 0 and 255.

*IDN?

Description This query extracts the IQ-5320 identification string.

Syntax *IDN?

Response “EXFO E.O. Engineering IQ-5320 Vxx.xx” where xx.xx is the current product version.

Note The command IDN? is equivalent to the command *IDN?. Both give the same result.

*OPC

Description This command will enable the IQ-5320 to respond to the *OPC? query.

Syntax *OPC

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

*OPC?

Description This query sets the operation complete bit in the ESR (bit 0) and puts an ASCII 1 in the output queue, when the contents of the input queue have been processed. This command is useful to prevent another command from processing until the current command is complete.

Syntax *OPC?

Response "1"

Note The command OPC? is equivalent to the command *OPC?. Both give the same result.

*RST

Description This command empties the step response list. It is only seen when part of another multiple command. In the example below, by adding this command after DATE?, you will not be able to access the answer. The *RST, in this instance, erases the date. In addition, this command also performs the following operations:
Return to initial state before command was sent, not necessarily to previous settings
Force the device to enter into an Operation Complete Command Idle State (OCIS)
Force the device to enter into an Operation Complete Query Active State (OQIS)
Initialize previous responses unless there has been a program message terminator preceded by an *RST

Syntax *RST

Example SHEL:DATE?;*RST<NL>

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

*SRE

Description This command sets bits in the Service Request Enable register and enables the corresponding bit in the Status Register. The command can be used to select which events can initiate a service request.

Syntax *SRE<space><value>

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

Note The command SRE is equivalent to the command *SRE. Both give the same result.

*SRE?

Description This query returns the contents of the Service Request Enable register.

Syntax *SRE?

Response A binary integer set between 0 and 255

Note The command SRE? is equivalent to the command *SRE?. Both give the same result.

*STB?

Description This query returns the contents of the Status Byte register.

Syntax *STB?

Response A binary integer set between 0 and 255

Note The command STB? is equivalent to the command *STB?. Both give the same result.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

*TRG

Description This command will trigger any suspended event and is waiting for a trigger.

Syntax *TRG

Parameters None

*TST?

Description This query initiates an internal self test, and returns a binary value indicating the results of the test.

Syntax *TST?

Response A binary value;
"0" test complete with errors
"1" test is successful

Note The command TST? is equivalent to the command *TST?. Both give the same result.

*WAI

Description This command prevents the IQ-5320 from processing any further commands until the No-Operation-Pending-Flag is set. All pending operations must be completed before processing another command.

Syntax *WAI

Parameters None

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

9.3 Specific 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 units.

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 format “y, z”, where
“y” is the wavelength in the format “9999.999 nm” or “999.9999 THz”, and
“z” is the power in the format “9.999E-009” watts or “99.99 dBm”.

Example CALC4:PEAK? 23

See also CALC:COUN?

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

INITiate:ACQuisit: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 command SENS:AVER:COUN before using the command INIT:AUTO. The results will be averaged over the total number of scans. The module will stop scanning after the number of scans specified with the command SENS:AVER:COUN.

Example INIT4:AUTO 1

See also INIT:ACQ:STAT?, INIT:CONT, INIT:REAL, INIT:SING, and SENS:AVER:COUN

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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 command SENS:AVER:COUN before using the command INIT:CONT.

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

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

INPut:OFFSet:POWer

Description This command changes the power offset. It is equivalent to the command SENS:CORR:OFFS:MAGN.

Syntax INP(0..26):OFFS:POW<space><digit>

Parameters The <digit> parameter is the new power offset (in dB) in the format "±9.99".

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 query SENS:CORR:OFFS:MAGN?.

Syntax INP(0..26):OFFS:POW?

Response The current power offset (in dB) in the format "±9.99".

Example INP4:OFFS:POW?

See also INP:OFFS:POW

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

INPut:THREshold:POWer

Description This command modifies the power detection threshold.

Syntax INP(0..26):THRE:POW<space><power>

Parameters The <power> parameter is a power value (in dB) in the format "±99.99".

Note This command will only have an impact on the following acquisitions.

Example INP4:THRE:POW 10

See also INP:THRE:POW?

INPut:THREshold:POWer?

Description This query returns the current power threshold.

Syntax INP(0..26):THRE:POW?

Response The current power threshold (in dB) in the format "±99.99".

Example INP4:THRE:POW?

See also INP:THRE:POW

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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

SENSe:AVERage:COUNt

Description This commands 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 format "99".

Example SENS4:AVER:COUN 12

See also INIT:AUTO, INIT:CONT, and SENS:AVER:COUN?

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

SENSe: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 format “99”.

Example SENS4:AVER:COUN?

See also SENS:AVER:COUN

SENSe:CORRection:COLLect:ZERO

Description This commands performs an offset nulling measurement.

Syntax SENS(0..26):CORR:COLL:ZERO

Example SENS4:CORR:COLL:ZERO

SENSe: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 command SENS:CORR:TEMP.

Example SENS4:CORR:MED 0

See also SENS:CORR:MED?, SENS:CORR:TEMP, and SENS:CORR:TEMP?

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

SENSe: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?

SENSe: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 format "±9.99".

Example SENS4:CORR:OFFS:MAGN 2.12

SENSe: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 format "±9.99".

Example SENS4:CORR:OFFS:MAGN?

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

SENSe: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 format “99.9”. Accepted values are from 0.0 to 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?

SENSe:CORRection:TEMPerature?

Description This querry returns the temperature value used for wavelength calculation in air.

Syntax SENS(0..26):CORR:TEMP?

Response The temperature value (in °C) in the format “99.9”.

Example SENS4:CORR:TEMP?

See also SENS:CORR:MED, SENS:CORR:MED?, and SENS:CORR:TEMP

SENSe:FREQuency:RANge?

Description This query returns the frequency range supported by the module.

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

Response Two frequencies in the format “999.9999”. 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?

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

SENSe: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 format “-99.99” (dBm) or “9.999E-999” (watt). 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 Units depend on current setting.

Example SENS:POW:RANG?

SENSe: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 format “9999.999”. 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?

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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 format “9” to “9999”.

Response A string of power values (in watts) associated to each of the 2000 points on the trace, each in the format “9.999E-009”.

Note The IQ-5320 produces a power spectrum whose amplitudes (in watts) 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

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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 watts.

Syntax TRAC(0..26):DATA:PRE?

Response The number of points composing the trace in the format “99999”. The first and last wave number values in the format “9999.9999”. The total power in the format “9.999E-999” (watt).

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:VALU?<space><position>

Parameters The <position> parameter has the format “9999.999” to indicate the wavelength or frequency (depending on the current units) for which the power value is searched.

Response The power value associated with the specified point in the format “±99.99” (dBm) or “9.999E-999” (watt), depending on current power unit.
If the specified point does not exist, the response is “over range” or “under range”.

Example TRAC4:DATA:VALU? 1560.000

See also TRAC:DATA?

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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 format "9999". 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 spectral unit to nm
"1" or "THZ" -switch spectral unit 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 units: "0" means nm and "1" means THz.

Example UNIT4:FREQ?

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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 watt
"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 watts and "1" means dBm.

Example UNIT4:POW?

9.4 Quick Reference 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?

Table 9-2. IQ-5320 Multi-Wavelength Meter Command Tree (Part 1 of 4)

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Command				Parameter/ Response	Description
	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
	THRE	POW		<±99.99>	Set detection threshold
		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

Table 9-2. IQ-5320 Multi-Wavelength Meter Command Tree (Part 2 of 4)

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Command			Parameter/ Response	Description
	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 9-2. IQ-5320 Multi-Wavelength Meter Command Tree (Part 3 of 4)

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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 9-2. IQ-5320 Multi-Wavelength Meter Command Tree (Part 4 of 4)

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

9.5 IQ-5320 Multi-Wavelength Meter Error Messages

Error Number	Description	Probable Cause
1500	“Invalid parameter.”	An invalid data parameter has been entered.
1501	“Not compatible with current unit.”	Request is not permitted with the current unit.
1502	“Acquisition running.”	An unallowed command 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 9-3. IQ-5320 Multi-Wavelength Meter Error Messages

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

10 MAINTENANCE AND TROUBLESHOOTING

10.1 Module Maintenance

To help ensure long, trouble-free operation

- Keep the IQ modules free of dust
- If ever the module should get wet, turn the power off immediately, and let it dry completely before turning it on again
- Clean the IQ module casing with a slightly damp (with water) cloth.

CAUTION

During cleaning, handle the module carefully and be careful not to damage the connector pins.

10.2 Cleaning Fiber Ends

Prior to testing, it is important that the fiber ends connected to the optical ports of the IQ-5320 be clean. Always cleaning connectors before plugging them to the IQ-5320 is also a good way to prevent dirt and dust from entering the port housing. To clean the fiber ends,

1. Make sure the fiber is not active.
2. Remove protective caps.
3. Gently wipe the fiber end with a lint-free pad dipped in isopropyl alcohol (98% pure or more).
4. Dry using clean compressed air.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

10.3 Cleaning Optical Ports

Dirty ports may affect the performance of the IQ-5320. To prevent dust and dirt from entering the port housing, always replace the protective caps on the optical ports when the IQ-5320 is not in use and make sure the connectors are clean before plugging them to the ports.

To clean the optical ports

1. Make sure no optical beam is coming out of the ports.

2. Remove the protective caps from the connectors.

3. Gently wipe the ports with a lint-free swab dipped in isopropyl alcohol (98% pure or more).

4. Dry using clean compressed air.

10.4 Recalibration

To ensure that the unit remains within the published specifications, EXFO recommends that an annual calibration be performed. Please contact EXFO for further information.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

10.5 Troubleshooting

10.5.1 Problems and Solutions

Problem	Possible Cause	Recommended Action
LED push button does not light up.	Power not on.	Check AC power cord and power on the IQ-203 and IQ-206. Refer to the *IQ-200 Optical Test System* Instruction Manual to check fuse.
	Module is not properly inserted.	Power off the IQ-203 and IQ-206, then remove and reinstall the module.
	Computer is locked up.	Reboot the IQ-203.
	LED is burnt out.	Call EXFO.
Pushing the LED push button does not open the module main window.	Computer is locked up.	Reboot the IQ-203.
Impossible to open a window.	Too many windows are open at the same time.	Close unused windows, then try to open the needed window again.
Higher than expected insertion loss.	Dirty optical connectors.	Clean all optical connectors using recommended procedure.
Poor repeatability.	Optical source is unstable.	Wait for source to stabilize.

Table 10-1. Problem, Possible Cause, and Recommended Action

Note: *In all cases, if the problem persists after performing the recommended actions, call EXFO (see Getting Help, on page 1-3).*

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

11 TECHNICAL SPECIFICATIONS

11.1 Wavelength Specifications

Note: *Wavelength specifications are guaranteed on 1520-1570 nm, typical elsewhere.*
All specifications are for a single peak present.
Specifications do not include connector repeatability.

Wavelength					
Parameter	**Min.**	**Typ.**	**Max.**	**Unit**	**Test Conditions/ Notes**
Wavelength Range	1450		1650	nm	
Absolute Wavelength Accuracy		±0.002	±0.005	nm	Add 0.001 nm for temperature variation
Wavelength Repeatability		±0.001		nm	Real time at 25°C
Wavelength Measurement Resolution		0.002		nm	Real time at 25°C
Display measurement resolution		0.001			
Discrimination 2 peaks		<0.06		nm	2 peaks with similar output power
Discrimination 2 peaks		<0.2		nm	2 peaks with dissimilar output power

Table 11-1. Wavelength Specifications

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

11.2 Power Specifications

Note: *All specifications are for a single peak present.*
Power specifications do not include connector repeatability.

Power					
Parameter	**Min.**	**Typ.**	**Max.**	**Unit**	**Test Conditions/ Notes**
Power Input Range	-30		+10	dBm	
Minimum measurable signal		-45 dBm			
Optical Power Accuracy		≤±0.1		dB	At 25°C, source: 1550 nm, -10dBm
Optical Power Flatness		<0.2		dB	
Optical Power Repeatability		±0.07		dB	Real time at 25°C
Optical Power Linearity		<0.1 <0.25		dB	-20 dBm to +10 dBm at 1550 nm -30 dBm to -20 dBm at 1550 nm
Optical S/N Ratio	>23	25		dB	Typical 25 dB. At ±0.4 nm; equivalent RBW of 0.06 nm.
Return Loss		>40		dB	with APC connector.
Polarization Dependence		<0.4		dB	

Table 11-2. Power Specifications

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

11.3 General Specifications

General			
Parameter	**Typ.**	**Unit**	**Test Conditions/ Notes**
Operating Temperature	5 to 40	°C	IAW MIL-STD-28800E class 3
Storage Temperature	-40 to 70	°C	IAW MIL-STD-28800E class 3
Humidity	0 to 95	%	non condensing IAW MIL-STD-28800E class 3
Module Size	12/1.5 3.8/2.95 26.2/10.4 2.80/1.28	cm/in. kg/lbs	2 IQ Slots
CE			Compliant Class A

Table 11-3. General Specifications

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

12 WARRANTY

12.1 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.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

12.2 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.

12.3 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.

12.4 Certification

EXFO certifies that this equipment met its published specifications at the time of shipment from the factory.

12.5 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.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

APPENDIX A – INTERFEROMETRIC WAVELENGTH MEASUREMENT THEORY

The IQ-5320 Multi-Wavelength Meter consists of a Michelson interferometer assembly mounted on two printed circuit boards with a fiber optic connector on one end and electrical connections on the other. A built in HeNe reference laser is also fiber coupled to the interferometer assembly for continuous absolute wavelength calibration.

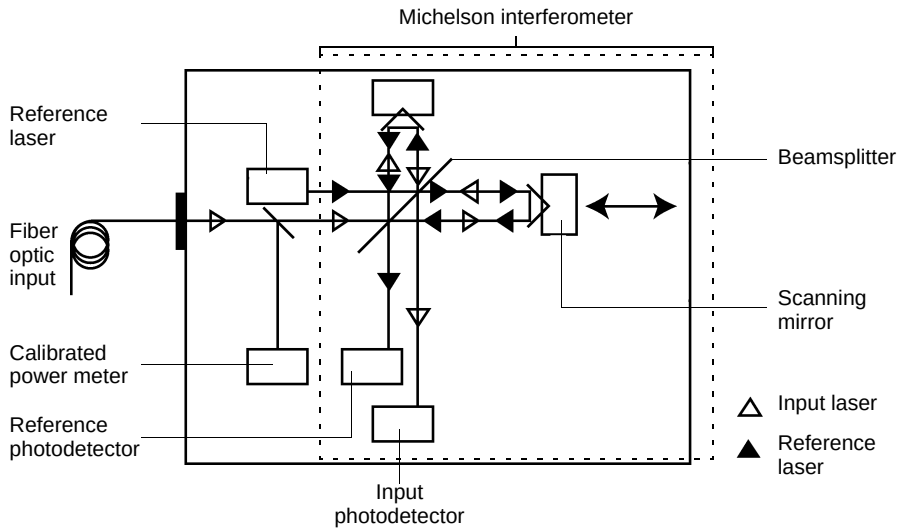


Figure A-1. Wavelength Meter Optical Schematic

Laser light to be anlyzed enters the IQ-5320 Multi-Wavelength Meter module through a fiber optic connector. The incoming beam is split into two paths, with one path directed to a laser power detector, and the other path directed to the interferometer. In the interferometer the beam is again split into two paths, with one path length varied by a scanning mechanism. The two paths are recombined, producing interference fringes that are detected by a photodiode. The reference laser passes through the interferometer along the same optical path and also produces fringes. These reference laser fringes are detected and used to sample the amplitude of the fringes from the input laser source. The sampled data points are stored in memory from which an on-board digital signal

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

processor (DSP) generates the spectrum by computing the Fast Fourier Transform (FFT) of the input signal. The resulting spectral data is transmitted to the host computer for further analysis and display via a communications interface connector on the end of the module. The measurement is performed and available for ouput every 1000 milliseconds.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

GLOSSARY

adapter	A device for coupling two connectors.
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.
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.
backscattering	That portion of scattered light that returns in a direction generally opposite to the direction of propagation.
baud rate	Measurement of data transmission speed, expressed in bits per second or bps.
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.
c	Velocity of light in a vacuum = 2.997925×10^8 m/s
°C	Degree Celsius. To convert to Fahrenheit: $F = \frac{9}{5}C + 32$.
CFR	Code of Federal Regulations

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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.
CW	Abbreviation for continuous wave. Refers to non-modulated, constant-intensity light.
dB	Decibel
dBm	Decibel referenced to a milliwatt.
decibel (dB)	The standard unit used to express gain or loss of optical power. A standard logarithmic unit for the ratio of two powers.
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.
DUT	Device under test
dynamic range	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.
EDFFA	Erbium doped fluoride fiber amplifier
EDFSA	Erbium doped silica fiber amplifier
EIA	Electronics Industries Association
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.
f	Abbreviation for femto, which indicates 10^{-15} units.
f	Frequency, often also designated by ν.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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.
frequency	The number of cycles per second, denoted by hertz (Hz).
G	Abbreviation for giga, which indicates 10^9 units.
Ge	Germanium
GeX	High power germanium
hr	Hour
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.
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.
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.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

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.
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
n	Abbreviation for nano, 10^{-9} units.
n	Refractive index. For the silica glass used in optical fibers, $n \approx 1.465$.
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.
p	Abbreviation for pico, 10^{-12} units
P	Power
PCS	Plastic-clad silica (fiber)
RMA	Return merchandise authorization
s	Second
sensitivity	For an optical instrument, the smallest signal that can be detected in the absence of any other signal.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Si	Silicon
SNR	Signal-to-noise ratio. The ratio of the received optical power, divided by the noise floor for the optical system.
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”.
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*”.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

This page intentionally left blank.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

INDEX

A

abbreviations Glossary-1
adding a channel 4-13
after-sales service 12-2
application
  closing 3-5
  installing 3-1
  parameters 4-1
  starting 3-1
auto feeding 7-9
Auto Monitoring Mode 4-9, 5-3

C

caps, protective 2-4
caution
  module insertion and removal 2-4
  of product hazard 1-2
certification
  information ix
  warranty 12-2
channel
  adding 4-13
  list 4-12
  modifying 4-14
  overlap 4-13, 4-14, 4-15
cleaning
  fiber ends 10-1
  module casing 10-1
  optical ports 10-2
closing
  application 3-5
  monitor window 3-4
compatible printers 7-9
connecting a fiber-optic cable 2-5
connections, optical 2-5
contacting EXFO 1-3
Continuous Monitoring Mode 4-8, 5-3
control
  local 2-1
  remote 2-1
creating, report template 7-5
Custom Monitoring Mode 4-9, 5-4
customizing report 7-7

D

defining, report parameters 7-1
description
  front panel 2-3
  IQ-5320 2-1
detection threshold 4-3
Drift Mode 4-9
DWDM source testing 2-1
Dynamic Data Exchange 2-1

E

equipment returns 12-3
EUI
  base plate 2-5
  connector adaptor 2-6
  dust cap 2-6
EXFO Universal Interface (EUI) 2-5

F

fiber ends, cleaning 10-1
fiber-optic cable connection 2-5
front panel description 2-3

G

generating a report 7-1
getting help 1-3
glossary Glossary-1
GPIB
  command structure 9-1
  interface 2-1
  quick reference command tree 9-22

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

I

insertion loss, higher than expected 10-3
installing application 3-1
interference fringes 13-1
interferometer 13-1
IQ-203 2-1
IQ-206 2-1
IQ-5320 description 2-1
IQ-software 1-1

L

LED push button
  functions 2-4
  problem 10-3
local control 2-1

M

maintenance
  cleaning fiber ends 10-1
  cleaning module casing 10-1
  cleaning optical ports 10-2
manual feeding 7-9
measurements, taking 5-1
Michelson interferometer 13-1
Mode
  Auto Monitoring 4-9, 5-3
  Continuous Monitoring 4-8, 5-3
  Custom Monitoring 4-9, 5-4
  Drift 4-9, 6-1
modifying a channel 4-14
module
  cleaning 10-1
  damage 2-7
  insertion 2-4
  nameplate 2-2
  removal 2-7
monitor window
  closing 3-4
  opening 3-4
mounting EUI connector adaptor 2-6

N

nameplate 2-2
nulling offsets 5-1, 6-1

O

offsets, nulling 5-1, 6-1
opening monitor window 3-4
optical
  connections 2-5
  port 2-3
optical ports, cleaning 10-2
overlapping channels 4-13, 4-14, 4-15

P

page, channel 4-12
paper
  orientation 7-10
  size 7-9
  source 7-9
parameters
  application 4-1
  channel 4-11
  for printing 7-7
  general 4-1
  report 7-1
  test 4-6
poor repeatability 10-3
port
  input 2-3
  optical 2-3
ports, cleaning 10-2
power units 4-2
power, referenced 4-4
printers 7-9
printing
  files 7-7
  number of copies 7-7
  paper feeding 7-9
  paper orientation 7-10
  paper size 7-9

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

printer configuration 7-7
printer selection 7-9
selecting a printer 7-9
product
nameplate 2-2
protective caps 2-4

Q

quick reference for GPIB commands 9-22

R

recalibration 10-2
recalling
a trace 5-7
report template 7-5
recalling a trace 6-7
referenced power 4-4
remote control 2-1
report
customizing 7-7
generating 7-1
parameters 7-1
template 7-5
report parameters
defining 7-1
report template
creating 7-5
recalling 7-5
RMA 12-3

S

safety
caution 1-2
important 1-2
warning 1-2
saving a trace 8-1
selecting a printer 7-9
service
after-sales 12-2
setting
application parameters 4-1
channel parameters 4-11
general parameters 4-1
test parameters 4-6
shipping to EXFO 12-3
specifications 11-1
starting application 3-1
storage temperature 1-3
supported printers 7-9
symbols Glossary-1

T

taking measurements
in Auto or Custom Monitoring Mode 5-6
in Drift Mode 6-1
technical specifications 11-1
temperature, storage 1-3
template, report 7-5
trace
recalling 5-7, 6-7
saving 8-1
transportation requirements 1-3
troubleshooting 10-3

U

units
power 4-2
wavelength 4-2

V

viewing
trace information 5-17, 6-15

W

warning of personal hazard 1-2
warranty
certification 12-2
exclusions 12-2
general 12-1
liability 12-2

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

null and void..... 12-1
wavelength units..... 4-2
window impossible to open..... 10-3
Windows..... 2-1

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP