

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 PM-1623* at our website: ***Click HERE***

S/N 418 59 - 1Z P/N IQ - 1101
G - 1.6
september 1997

IQ Power Meter Modules

IQ-1100 Single-Channel Power Meter

IQ-1200 Four-Channel Power Meter

IQ-1500 Calibration Power Meter

Instruction Manual

November 1996
P/N: MAN-090-I .1ACE

First Edition

CE

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 Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.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 E.O. 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.

© 1996 EXFO Electro-Optical Engineering Inc.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Contents

Abbreviations & Symbols viii
Certification Information x

1 INTRODUCTION 1-1

1.1 Presentation 1-1
1.2 IQ-200 Product Line 1-1
1.3 Unpacking and Inspection 1-2
1.4 Safety Conventions 1-3
1.5 Safety Information 1-3
1.6 Transportation and Storage 1-4
1.7 Getting Help 1-4

2 PRELIMINARY INFORMATION 2-1

2.1 General Description 2-1
2.2 Front Panel Description 2-4
2.3 Module Insertion 2-5
2.4 Optical Connections 2-6
2.5 Module Removal 2-6
2.6 Loading the Application 2-7
2.7 Monitor Window 2-9
2.8 Temperature Warning (IQ-1500 only) 2-10
2.9 Exiting the Application Software 2-11

3 NORMAL MODE 3-1

3.1 Main Window Description 3-1
3.2 Channel Setup 3-8
3.3 Setting Wavelength 3-18
3.4 Power Measurements 3-19
3.5 Data Acquisition 3-24
3.6 Consulting Data 3-33

4 GRAPHICAL DISPLAY MODE 4-1

4.1 Graphical Display Mode Window Description 4-1
4.2 Options Window Description 4-6
4.3 Refresh Rate 4-11

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.4 Zoom Control 4-12
4.5 Scrolling 4-13
4.6 Marker Control 4-15
4.7 Printing Graphics 4-18

5 CALIBRATION MODE (IQ-1500 ONLY) 5-1

5.1 Main Window Description 5-1
5.2 Step-by-Step Calibration Procedure 5-6
5.3 Channel Setup 5-11
5.4 Calibration Information 5-12
5.5 Auto Store 5-26
5.6 DUT Results 5-27
5.7 Calibration Summary 5-29
5.8 Printing a Report of Calibration 5-33

6 SUGGESTED APPLICATIONS 6-1

6.1 Introduction 6-1
6.2 Performing Absolute Power Measurements 6-2
6.3 Measuring Insertion Loss 6-3
6.4 Instrument Linearity Testing 6-6
6.5 Calibration of Optical Power Meters (IQ-1500) 6-8
6.6 Other Applications 6-10

7 MAINTENANCE 7-1

7.1 Cleaning the Fiber Ends 7-1
7.2 Cleaning the Detector Ports 7-1
7.3 Recalibration 7-2

8 TROUBLESHOOTING 8-1

9 TECHNICAL SPECIFICATIONS 9-1

9.1 IQ-1100 Single-Channel Power Meter 9-1
9.2 IQ-1200 Multi-Channel Power Meter 9-2
9.3 IQ-1500 Calibration Power Meter 9-3

10 CUSTOMER COMMENTS 10-1

11 WARRANTY 11-1

11.1 General Information 11-1

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

11.2 Liability 11-2
11.3 Exclusions 11-2
11.4 Certification 11-2
11.5 Service and Repairs 11-3

APPENDIX A - IQ-1500 REPORT OF CALIBRATION A-1

INDEX INDEX-1

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figures

Figure 2-1. Module Nameplate 2-3
Figure 2-2. Front Panel of the IQ Power Meter Series modules 2-4
Figure 2-3. Typical Main Window 2-8
Figure 2-4. Normal Mode Monitor Window 2-9
Figure 2-5. Calibration Mode Monitor Window 2-9
Figure 2-6. Stabilizing Icon 2-10
Figure 3-1. Main Window - Normal Mode 3-2
Figure 3-2. Channel Setup Window (IQ-1100 and IQ-1500) 3-8
Figure 3-3. Channel Setup Window (IQ-1200) 3-8
Figure 3-4. Defining the Virtual Channel 3-11
Figure 3-5. Units List Box 3-14
Figure 3-6. Resolution List Box 3-15
Figure 3-7. Sampling Rate List Box 3-16
Figure 3-8. Offset Edit Box 3-17
Figure 3-9. Adding and Deleting Wavelengths 3-17
Figure 3-10. Setting Wavelength 3-19
Figure 3-11. Absolute Power Display 3-20
Figure 3-12. Relative Display Mode 3-21
Figure 3-13. Acquisition Setup Window (IQ-1100 and IQ-1500) 3-25
Figure 3-14. Acquisition Setup Window (IQ-1200) 3-26
Figure 3-15. Main Window in Normal Mode during Data Acquisition 3-28
Figure 3-16. Trigger Condition Box 3-30
Figure 3-17. Data Displayed by Text Editor 3-33
Figure 3-18. Data into a Spreadsheet Program 3-34
Figure 4-1. Graphical Display Mode Window 4-1
Figure 4-2. Two Curves in the Graphical Display Area 4-4
Figure 4-3. Three Channel Results in the Graphical Display Area 4-5
Figure 4-4. Options Window 4-7
Figure 4-5. Channel Selection for Real-Time Sampling 4-9
Figure 4-6. Refresh Rate Window 4-12
Figure 4-7. Zoom Control Buttons 4-13
Figure 4-8. Scrolling 4-14
Figure 4-9. Marker Control Display 4-16
Figure 4-10. Print View Window 4-18
Figure 5-1. Main Window - Calibration Mode 5-2
Figure 5-2. Step-by-Step Procedure (Setup) 5-7

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figure 5-3. Step-by-Step Procedure (Information) 5-7
Figure 5-4. Step-by-Step Procedure (Null) 5-8
Figure 5-5. Step-by-Step Procedure (Calibration) 5-8
Figure 5-6. Step-by-Step Procedure (Save) 5-9
Figure 5-7. Step-by-Step Procedure (Report) 5-10
Figure 5-8. Channel Setup Window 5-11
Figure 5-9. General Information Page 5-13
Figure 5-10. Device Under Test (DUT) Page. 5-15
Figure 5-11. Reference Conditions Page 5-18
Figure 5-12. Uncertainties Page 5-22
Figure 5-13. Auto Store Window 5-27
Figure 5-14. DUT Results Window 5-28
Figure 5-15. All Wavelengths Page 5-30
Figure 5-16. Single Wavelength Page 5-32
Figure 5-17. Report Window 5-34
Figure 6-1. Absolute Power Measurement Setup 6-2
Figure 6-2. Setup for Taking a Reference Measurement 6-4
Figure 6-3. Testing Insertion Loss 6-5
Figure 6-4. Multi-Device Insertion Loss Testing 6-6
Figure 6-5. Confirming Attenuator Linearity 6-7
Figure 6-6. Calibration Setup 6-9

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

ABBREVIATIONS & SYMBOLS

Technical Terms	
λ	wavelength, in nanometers (nm) for fiber-optic applications
AC	alternating current
CPU	central processing unit
CRT	cathode ray tube
CW	continuous wave
DC	direct current
FOA	fiber-optic adapter
GPIB	general purpose interface bus
LCD	liquid crystal display
LED	light emitting diode
LSR	laser (light amplification by stimulated emission of radiation)
MB	megabyte
MHz	megahertz
RAM	random access memory
SCPI	standard commands for programmable instruments
TEC	thermo-electrically cooled (LSR)
VA	volt-ampere
VAC	volt (alternating current)
VGA	video graphics array

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Orders of Magnitude		
G	giga	(10^9)
M	mega	(10^6)
k	kilo	(10^3)
m	milli	(10^{-3})
µ	micro	(10^{-6})
n	nano	(10^{-9})
p...	pico	(10^{-12})

Measurement Units	
Bd	baud
dB	decibel
dBm	dB ref. to 1mW
Hz	hertz
m	meter
W	watt

Materials	
Ge	germanium
InGaAs	indium gallium arsenide
NiCd	nickel cadmium
PCS	plastic-clad silica
PVC	polyvinyl chloride
Si	silicon

Institutions and Corporations	
IBM	International Business Machines
NIST	National Institute of Standards and Technology

Miscellaneous	
CFR	Code of Federal Regulations
PC	personal computer (trademark of IBM)
RMA	return merchandise authorization

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CERTIFICATION INFORMATION

F.C.C. INFORMATION TO USER

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate frequency energy and, if not installed and used in accordance with instruction manual, may cause harmful interference to radio communications. However, there are no guarantees that interference to radio interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

WARNING

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

PERFORMANCE VARIATION

In a 3 V/m radiated field (26–1000 MHz, 80% AM modulation with a 1 kHz sine wave) or with a conducted RF field of 3 V (0.15–100 MHz, 80% AM modulation with a 1 kHz sine wave), readings may vary by ±0.1 µW.

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 Ultra Tech Engineering Labs Inc., a renowned test laboratory from Misssissauga, Canada. This guarantees the unerring objectivity and authoritative compliance of all test results.

CE INFORMATION TO USER

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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1 INTRODUCTION

1.1 Presentation

EXFO E.O. Engineering Inc. (EXFO) is pleased to introduce the IQ Power Meter Series which includes

- the IQ-1100 Single-Channel Power Meter
- the IQ-1200 Four-Channel Power Meter
- the IQ-1500 Calibration Power Meter

EXFO's commitment to superior design in all 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 Power Meter Series will provide many years of reliable operation. In order to fully benefit from the many features the IQ Power Meter Series offers, it is important to read the contents of this instruction manual thoroughly.

1.2 IQ-200 Product Line

The IQ-200 product line is a modular optical test system designed for laboratory applications. Thanks to the Windows™ compatible IQ

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Software, the IQ-200 Optical Test System combines power, performance, flexibility with 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.

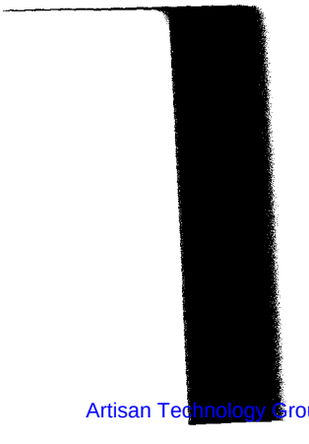
For more information on the IQ-200 Optical Test System and the IQ Software, please refer to the *IQ-200 Optical Test System Instruction Manual*.

1.3 Unpacking and Inspection

The IQ Power Meter modules are delivered with the following standard items:

- IQ Power Meter module (IQ-1100, 1200, or 1500)
- Instruction Manual
- fiber-optic adapter(s)
- test jumper(s) (with the IQ-1500)
- back-up floppy disk
- accessory kit (optional)
- Certificate of Calibration
- Declaration of Conformity

The IQ Power Meter modules are thoroughly inspected before shipment. If any damage has occurred during transportation or if any item is missing, please notify EXFO immediately.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.4 Safety Conventions

The following conventions should be clearly understood before operating the unit:

WARNING Refers to a potential personal hazard. It requires a procedure which, if not correctly followed, may result in personal injury. Do not proceed beyond a **WARNING** unless the required conditions are fully understood and met.

CAUTION Refers to a potential product hazard. It requires a procedure which, if not correctly followed, may result in irreparable component damage. Do not proceed beyond a **CAUTION** unless the required conditions are fully understood and met.

IMPORTANT Refers to any information regarding the operation of the product which should not be overlooked.

1.5 Safety Information

Laser radiation may be encountered at the output port when an active source is connected to the IQ Power Meter input port.

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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.6 Transportation and Storage

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

- If the unit is to be shipped, pack it in the original packing material for best protection.
- When not in use, 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.

1.7 Getting Help

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

USA and Canada	Tel.:	1-800-663-EXFO
	Fax:	1-418-683-2170
	E-mail:	info@exfo.com
International	Tel.:	1-418-683-0211
	Fax:	1-418-683-2170
	E-mail:	info@exfo.com
EXFO Europe	Tel.:	33-1-34.63.00.20
	Fax:	33-1-34.65.90.93
	E-mail:	exfoeur@ibm.net

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2 PRELIMINARY INFORMATION

2.1 General Description

The IQ-1100 is a single-channel, high-sensitivity optical power meter configured with either a silicon (Si), indium gallium arsenide (InGaAs), or high-power germanium (GeX) optical detector.

The IQ-1200 is a four-channel, highly sensitive and accurate optical power meter configured with either silicon (Si), indium gallium arsenide (InGaAs), germanium (Ge), or high-power germanium (GeX) optical detectors.

The IQ-1500 is a single-channel, high-accuracy calibration optical power meter configured with either a temperature stabilized silicon (Si) or germanium (Ge) optical detector.

Please see Section 9, *Technical Specifications*, for details on all configurations.

The IQ Power Meter Series is designed for laboratory and industrial environments using the IQ-200 Optical Test System. The corresponding features are summarized in the following table:

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

	1100	1200	1500
Normal Mode			
Power displayed in dB, dBm, or watt (mW, µW, nW or pW) at a user-defined or automatic resolution	✓	✓	✓
Absolute, relative, and offset display modes	✓	✓	✓
Multiple operating wavelengths	✓	✓	✓
0.1 nm resolution			✓
Variable sampling rate	✓		✓
Three data acquisition methods	✓	✓	✓
Ability to save multiple customized configurations	✓	✓	✓
Extended measurement range	✓		
Averaged power measurement	✓		✓
Four optical channels plus a virtual channel		✓	
Independent channel configuration and selection	✓	✓	✓
Graphical Display Mode			
Real-time power readings of up to eight channels in a graphical display and up to four channels in a tabular display.	✓	✓	✓
Minimum and maximum power thresholds to activate visual and/or audible alarms	✓	✓	✓
Delta calculation of two points on a curve	✓	✓	✓
Full printing capabilities	✓	✓	✓
Calibration Mode			
Step-by-step calibration procedure			✓
Total uncertainty calculation			✓
Detailed calibration reports			✓

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The IQ Power Meter Series supports both local and remote control. Local control is via the Windows™ compatible software. The software provides a user-friendly interface offering flexible power meter operation.

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

The product nameplate is located on a side panel near the rear of every module.

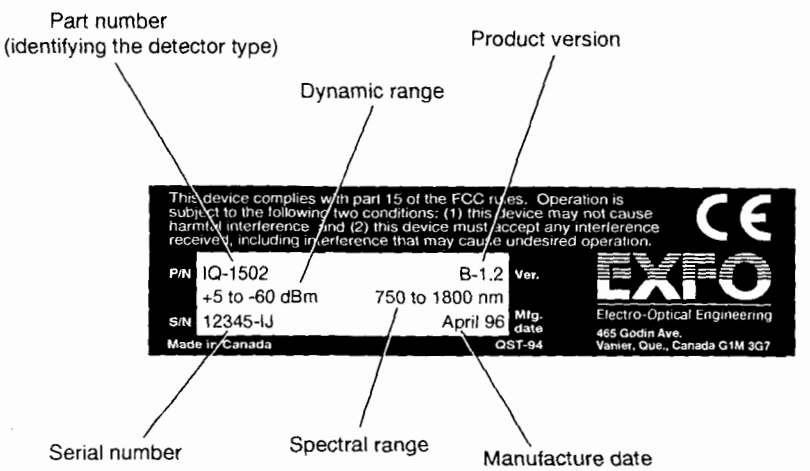


Figure 2-1. Module Nameplate

Note: *The information found on the nameplate will differ according to the module configuration.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.2 Front Panel Description

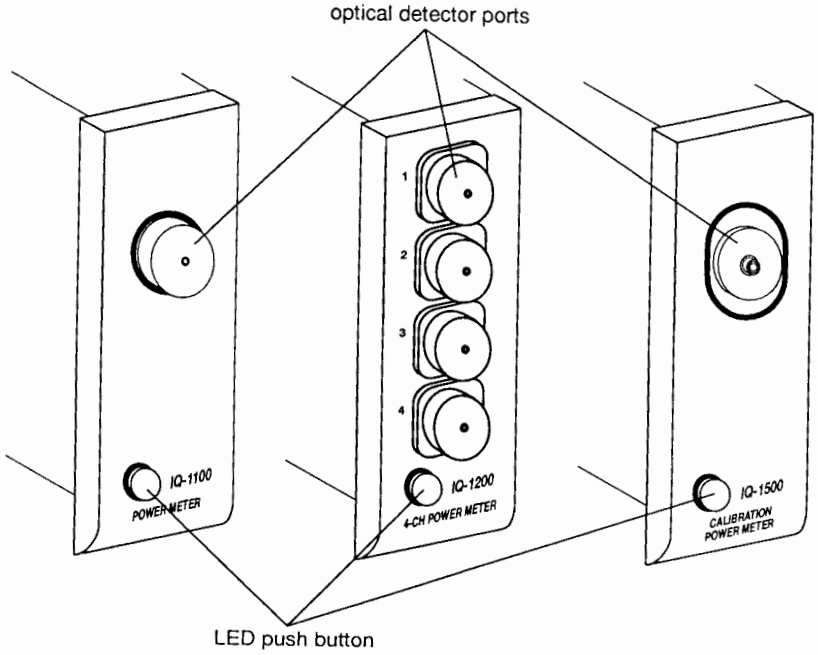


Figure 2-2. Front Panel of the IQ Power Meter Series modules

Note: *Actual port(s) and adapter(s) may differ from those depicted in the illustrations.*

2.2.1 Detector Ports

The optical detectors are located on the front panel of the modules. The protective caps, provided with the module, should be installed on the detectors whenever the module is not being used.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.2.2 LED Push Button

The LED push button on the front panel has the following three functions:

- At system power on, the LED push button will illuminate.
- Pressing the LED push button activates the main window.
- Pressing the LED push button when the main window is open activates the monitor window.

Note: *The monitor window is a compact window displaying basic data and is fully explained in Section 2.7,* Monitor Window.

2.3 Module Insertion

CAUTION

Never insert or remove any module when the IQ-203 Mainframe or the IQ-206 Expansion Units are in operation. This may result in immediate irreparable damage to the module and the IQ-203/IQ-206.

To insert the module

1. Turn off the IQ-203/IQ-206.
2. Insert the IQ module into any available slot. The IQ-203/IQ-206 will automatically recognize the selected slot on power up.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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.

2.4 Optical Connections

The fiber-optic test jumper ends should always be cleaned before connecting to the modules to ensure optimum performance and to avoid erroneous readings. A fiber end cleaning procedure is given on page 7-1.

To connect the fiber-optic test jumper to the power meter module

1. Remove the connector cap.
2. Screw a fiber-optic adapter to the detector housing (if not already installed).
3. Ensure that the test jumper connector is clean and dry.
4. Align the test jumper connector and detector port to avoid the fiber end touching the outside of the port or rubbing against other surfaces.
5. Connect the fiber to the fiber-optic adapter. Do not overtighten.

2.5 Module Removal

CAUTION

Never insert or remove any module when the IQ-203 Mainframe or the IQ-206 Expansion Units are in operation. This will result in immediate irreparable damage to the module and the IQ-203/IQ-206.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

To remove the module

1. Turn off the IQ-203/IQ-206.
2. Place fingers under the front panel of the module and firmly pull outward.

2.6 Loading the Application

The many features of the IQ Power Meter Series are controlled using the Windows™ compatible IQ Software. Please refer to the *IQ-200 Optical Test System* Instruction Manual for information regarding the IQ-200 Optical Test System, IQ-203 front panel description, and IQ Software conventions.

As explained in the *IQ-200 Optical Test System* Instruction Manual, an icon appears in the IQ Software main window for each module comprised in the IQ-200 Optical Test System.

There are three ways to load the application software.

- Press the LED push button on the front panel of the desired module.
- Double-click on the desired icon in the IQ-200 Optical Test System main window.
- Use TAB to choose the desired icon in the IQ-200 Optical Test System main window, then press ENTER.

Once the application is loaded, the corresponding main window opens. The main window contains all the necessary commands to control the IQ Power Meter module.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

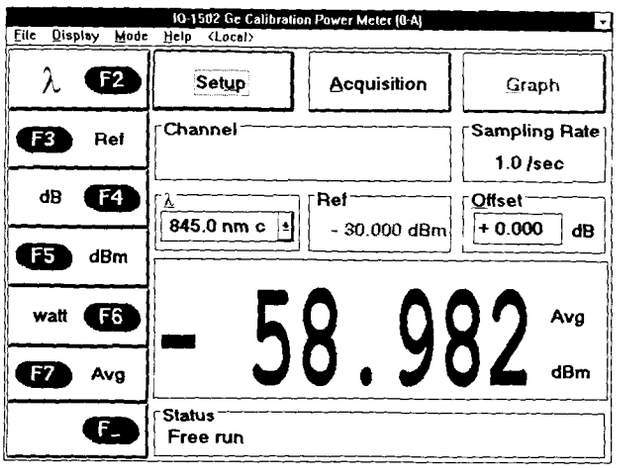


Figure 2-3. Typical Main Window

Note: *Depending on the configuration of your module, the actual main window may differ from the one depicted in the illustration.*

The main window will differ depending if you are in Normal mode or in Calibration mode. Detailed information on the main window and its components is given in Section 3, *Normal Mode* and in Section 5, *Calibration Mode (IQ-1500 only).*

IMPORTANT

Before proceeding with optical power measurements the electronic offset nulling should be performed. The offset nulling procedure is given in Section 3.2.4.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.7 Monitor Window

The monitor window displays basic power meter status data. Using the monitor window in conjunction with other module monitor windows allows the creation of 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.



Figure 2-4. Normal Mode Monitor Window

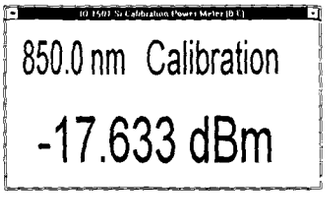


Figure 2-5. Calibration Mode Monitor Window

2.7.1 Opening the Monitor Window

There are three ways to open the monitor window:

- In the main window, choose **Monitor** from the **Display** menu.
- In the main window, click on [▼] (in the upper right corner).
- Push the LED button (on the front panel of the module).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.7.2 Closing the Monitor Window

There are two ways to close the monitor window and 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 while in monitor window view 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.*

2.8 Temperature Warning (IQ-1500 only)

The temperature stabilization circuitry of the IQ-1500 detector is activated when the IQ-200 Optical Test System software is running and the LED push button on the front panel of the module is illuminated. Under normal operating conditions, the temperature of the detector takes approximately 15 minutes to stabilize.

Depending on how long the system has been running, the stabilizing icon may be flashing when the IQ-1500 application is first started. This flashing icon indicates that the temperature of the detector has not yet stabilized.



Figure 2-6. Stabilizing Icon

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Although it is not recommended to perform critical measurements while this icon is flashing, the module and the software will allow you to perform measurements during the warm-up period.

If the ambient environmental conditions are out of specifications or if the IQ-1500 malfunctions, the following message will appear after 30 minutes of instability.

"Unable to stabilize the IQ-1500 detector temperature! Please verify that the ambient temperature is within the recommended range (23°C ±5°C) and correct if necessary. If the problem persists, contact the EXFO Service Department."

2.9 Exiting the Application Software

Closing any application software that is not in use is a good way to free system memory. The application software can be closed either from the main window or from the monitor window.

2.9.1 From the Main Window

To exit the application software from the main window, choose **Exit** from the **File** menu.

2.9.2 From the Monitor Window

There are two ways to exit the application software from the monitor window:

- Click on  (in the upper left corner), then select **Close**.
- Double-click on (in the upper left corner).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3 NORMAL MODE

The normal mode is the default measurement mode for all IQ Power Meter modules. The IQ-1500 is the only module that can operate in Calibration mode. To toggle between Normal mode and Calibration mode (IQ-1500), access the *Mode* menu.

The user interface described in this section is a normal optical power meter operating environment. This operating environment is ideal for performing

- insertion loss measurements
- absolute power measurement
- linearity verifications
- data acquisitions

3.1 Main Window Description

The Normal mode main window can be broken down into four sections:

- title bar and menu bar
- function buttons
- parameter definition buttons
- data and status display

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

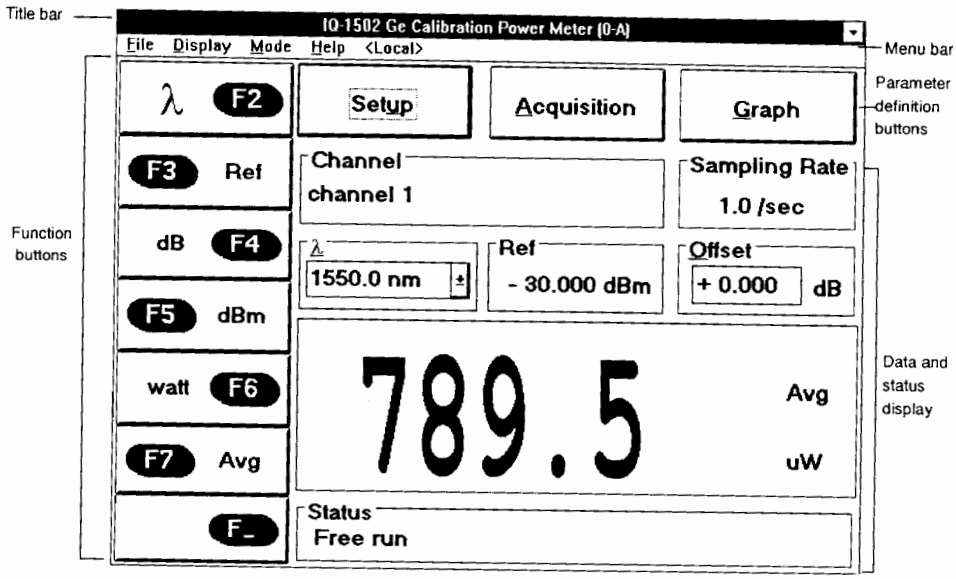


Figure 3-1. Main Window - Normal Mode

Note: *Depending on the configuration of your module the main window may differ from the illustration.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.1.1 Title Bar and Menu Bar

The title bar and the menu bar are at the top of the main window (see Figure 3-1). The title bar indicates the type of power meter you are using. The menu bar contains drop-down menus that are explained in the following table:

MENU	OPTION	FUNCTION
File	Open config.	Opens to a previously saved configuration.
	Open as template	Opens to a previously saved configuration without the data.
	Save config.	Saves the current configuration.
	Exit	Closes the application.
Display	Monitor	Opens the monitor window which displays basic calibration power meter data (see *Monitor Window*, on page 2-9 for deatiled information).
Mode (IQ-1500)	Normal	Switches the unit to a normal optical power meter operating environment, which is ideal for performing insertion loss measurements, linearity verifications, and data acquisitions.
	Calibration	Switches the unit to Calibration mode that enables you to perform an optical calibration on a wide variety of optical power meters.

Table 3-1. Main Window Pull-Down Menus

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

MENU	OPTION	FUNCTION
Help	Contents	Opens the application Help file, which contains the text of the present instruction manual.
	About	Opens a window which provides the following information: •• software version •• technical assistance telephone numbers •• available IQ-203 system memory (includes RAM and virtual memory) •• remaining hard disk drive storage space •• IQ load: this value refers to the current load on the IQ-203 mainframe. The IQ load can be used up to 100% without any problem.

Table 3-1. Main Window Pull-Down Menus

On the menu bar, you also find the inscription <local>, <remote>,or <lockout>, which indicate if the IQ Power Meter module is controlled locally or through a GPIB link. The table below explains the meaning of these inscriptions. For more information on how to control the different IQ modules through a GPIB link, refer to the *GPIB and Application Development Guide*.

INDICATION	MEANING
<local>	The unit is controlled locally.
<remote>	The unit is controlled through a GPIB link but local commands can still be used.
<lockout>	The unit is exclusively controlled through a GPIB link.

Table 3-2. Module Control Status

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.1.2 Function Buttons

The function buttons, along the left side of the main windows (refer to Figure 3-1) are used for direct control of the power meter.

BUTTON	DESCRIPTION
λ F2	Switches to the next wavelength as defined by the contents of the λ list box (see Section 3.3, *Setting Wavelength*).
F3 Ref	Performs a reference power measurement for the currently selected wavelength (see Section 3.4.2, *Relative Power*).
dB F4	Switches to relative display mode where the value displayed is equal to the absolute power minus the reference power (see Section 3.4.2, *Relative Power*).
F5 dBm	Switches to absolute mode displaying power values in dBm (see Section 3.4.1, *Absolute Power*).
Watt F6	Switches to absolute mode displaying power values in watt (see Section 3.4.1, *Absolute Power*).
F7 Avg	(IQ-1100 and IQ-1500) Toggles between averaged and unaveraged displayed values (see Section 3.4.4, *Averaged Measurement (IQ-1100 and IQ-1500)*).
F7 Chan	(IQ-1200 only) Switches to the next channel.

Table 3-3. Function Buttons - Normal Mode

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

BUTTON	DESCRIPTION
F_	Transfers control to the IQ-203 front panel function keys (refer to the *IQ-200 Optical Test System Instruction Manual*).

Table 3-3. Function Buttons - Normal Mode

Note: *These function buttons are also available in monitor window mode. Place the cursor in the monitor window and press the right mouse button.*

3.1.3 Parameter Definition Buttons

Choosing any of the parameter definition buttons opens a window for the definition and customization of various operating parameters.

BUTTON	DESCRIPTION
Setup	Opens the *Channel Setup* window, allowing to customize specific channel parameters (see Section 3.2, *Channel Setup*).
Acquisition	Opens the *Acquisition Setup* window, allowing to define data acquisition parameters and to control the acquisition process (see Section 3.5, *Data Acquisition*)
Graph	Opens the *Graphical Display Mode* window, allowing to display real-time power readings of up to eight channels at a time in a graphical or tabular format (see Section 4, *Graphical Display Mode*).

Table 3-4. Parameter Definition Buttons

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.1.4 Data and Status Display

The data and status display, shown in Figure 3-1, consists of list boxes, edit boxes, and display boxes. A description of these various screen components is provided in the following table.

BOX	DESCRIPTION
Channel	Displays current channel identification.
Sampling Rate	Displays the current sampling rate.
λ	Displays the selected wavelength and allows to select a new one.
Ref	Displays the reference measurement.
Offset	Displays the current offset value, which is added to the measured power when dB or dBm display units are selected.
Display	Displays power readings in dBm, dB, or watt (pW, nW, μW, or mW). When a dashed line (-------) is displayed, the power level is below the minimum power that can be measured. When the crossed line (+++++++) is displayed , the power level is over the maximum measurable power.
Status	Displays the current module status: • **Free run** - No data acquisition is in progress. • **Waiting for trigger or start time** - Data acquisition will begin after a specified time or condition. • **Acquiring** - Data acquisition is in progress. • **Processing...** - The IQ-203 is processing the latest commands. • **Stabilizing...** - The temperature of the module components is stabilizing.

Table 3-5. Data and Status Boxes in Normal Mode

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.2 Channel Setup

From the main window, choosing **Setup** opens the *Channel Setup* window.

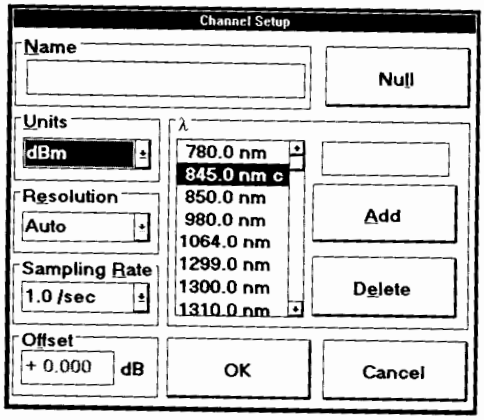


Figure 3-2. Channel Setup Window (IQ-1100 and IQ-1500)

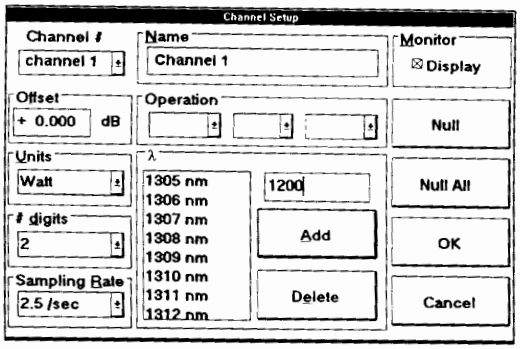


Figure 3-3. Channel Setup Window (IQ-1200)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The *Channel Setup* window allows you to customize specific channel parameters. The following items can be controlled:

- channel selection (IQ-1200 only)
- virtual channel (IQ-1200 only)
- channel name
- offset nulling
- monitor window selection (IQ-1200 only)
- display units
- display resolution
- sampling rate
- display offset
- available wavelengths

Once all desired parameters are set in the *Channel Setup* window, choose OK to confirm your choice and close the *Channel Setup* window, or Cancel to close the *Channel Setup* window without recording the current changes.

3.2.1 Channel Selection (IQ-1200 only)

The IQ-1200 has four independent optical channels. In addition, the IQ Software offers a virtual channel, which is a combination (sum or difference) of the measured power from any two optical channels. Definition of the virtual channel is discussed in Section 3.2.2, *Virtual Channel Definition (IQ-1200 only).*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Note: *A channel may also be selected from the IQ-1200 main window by choosing the* F7 Chan *button.*

To select a channel from the *Channel Setup* window:

1. Choose the ▼ button. The *Channel #* list box opens.
2. Click on the desired channel.

3.2.2 Virtual Channel Definition (IQ-1200 only)

The virtual channel is generated by the IQ Software. Measurement values from any two optical channels are either added or subtracted to produce the virtual channel value. This feature provides an extremely flexible comparative measurement display. The virtual channel is used and controlled in the same way as the four optical channels.

The virtual channel is an excellent tool for comparing two optical channels. For example, if two devices (connected to channels 1 and 2) are supposed to have identical power levels, displaying a virtual channel (defined as channel 1 minus channel 2) provides quick monitoring of both devices and will highlight any power fluctuations.

To define the virtual channel

1. In the *Channel Setup* window, select the virtual channel.
2. In the first box of the *Operation* area, select the first optical channel.
3. In the second box, select the virtual channel operator (+ or -).
4. In the third box, select the second channel.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

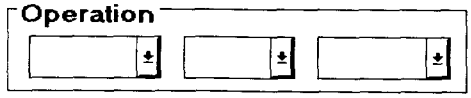


Figure 3-4. Defining the Virtual Channel

Note: *The second channel must have the same units and wavelength as the first channel.*

3.2.3 Entering a Channel Name

A user-selected name can be given to each power meter channel, including the virtual channel in the case of the IQ-1200. The channel name appears in the main window as well as in the Monitor window. Naming each channel is particularly useful when more than one power meter module is being used. The name should be as descriptive as possible (for example «Power-Fiber 1»). To enter a channel name

1. In the *Channel Setup* window, if necessary, select the desired channel.
2. Double click on the *Name* edit box.
3. Enter any descriptive text. Depending on the selected text, between 14 and 55 characters may be entered.

Tip*: Lower case characters need less screen space and will therefore allow longer descriptive names.*

3.2.4 Offset Nulling

Before proceeding with optical power measurements, the electronic offset nulling should be performed.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

IMPORTANT

Light must not reach the detector when performing the offset nulling.

The offset nulling provides a zero power reference measurement. It is designed to nullify the effects of any internal electronic signal, which may drift over long periods of time or with changes in ambient temperature. For optimum performance, it is recommended to perform an offset nulling before each critical power measurement.

To perform an offset nulling on one channel

1. Install the detector cap.
2. If necessary, in the *Channel Setup* window, select the channel to be nulled.
3. From the *Channel Setup* window, choose [Null]. A message window is displayed during the offset nulling (approximately 20 seconds).

Note: *Offset nulling constants are retained until a new offset nulling is performed.*

To determine whether or not the offset nulling has been correctly performed (IQ-1500 only)

1. Install the detector cap.
2. Change the measurement units to watt.
3. Monitor the power readings.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

If the measurement is between -9 pW and +9 pW, the electronic offset has been properly nulled. If the value is outside this range, a new null measurement should be performed.

Note: *In Calibration mode, the offset nulling can be directly performed by pressing* [F3 Null].

With the IQ-1200 multi-channel power meter, the offset nulling can be performed for all channels at the same time.

1. Install a cap on each detector.
2. From the *Channel Setup* window, choose [Null All]. A **Nulling in progress** message window is displayed for approximately 60 seconds.

Note: *Offset nulling constants are retained for each channel until a new null measurement is performed.*

3.2.5 Monitor Window Selection (IQ-1200 only)

The IQ-1200 monitor window can include basic operating information for up to four channels at a time.

To add a channel to the monitor window

1. In the *Channel Setup* window, select the desired channel.
2. Click on the *Monitor Display* check box.

   If the box is already checked, this action will remove the channel from the Monitor window.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Note: *If all five channels are selected for display (4 plus the virtual channel), an error message stating that only four channels can be displayed in the monitor window, will appear.*

3.2.6 Selecting Measurement Units

Power measurements can be displayed in dB, dBm, or watt (pW, nW, µW, or mW depending on the configuration of the module). When units are in watt, the software automatically selects pW, nW, µW, or mW, depending on the measured power and on the sensitivity of the detector.

Note: *Measurement units can also be selected using the main window function keys (i.e.* dB F4, F5 dBm, *or* watt F6*).*

1. From the *Channel Setup* window, if necessary, select the desired channel.
2. Open the *Units* list box.

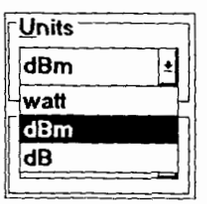


Figure 3-5. Units List Box

3. Click on the desired units.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.2.7 Selecting Display Resolution

Depending on the required resolution and operating power level, 0, 1, 2, or 3 digits can be displayed after the decimal point. When **Auto** is selected, the display resolution is determined by the power level being measured.

Note: *Higher power levels can be more accurately measured and therefore displayed with a greater resolution.*

1. From the *Channel Setup* window, if necessary, select the desired channel.
2. Open the *Resolution* list box.

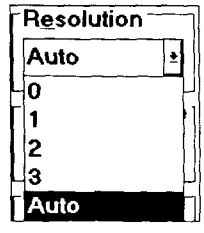


Figure 3-6. Resolution List Box

3. Click on the number of digits desired after the decimal point.

3.2.8 Selecting a Sampling Rate (IQ-1100 and IQ-1500)

Depending on the power meter module configuration, various sampling rates are offered. According to your specific requirements and the power level, you will select a sampling rate that will optimize instrument flexibility and measurement repeatability, as well as determine the quantity of data generated during data acquisition.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

➤ ***Tip**: Use a lower sampling rate (averaged) for greater repeatability when measuring very low power.*

1. From the *Channel Setup* window, open the *Sampling Rate* list box.

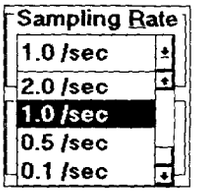


Figure 3-7. Sampling Rate List Box

2. Click on the desired sampling rate.

Sampling rate can also be set directly from the main window.

3.2.9 Setting an Offset Value

When a non-zero offset value is defined, the displayed power is equal to the actual power plus the offset value. The offset value can be positive or negative, and is always expressed in dB. Offsetting the measured power is useful when compensating for known power losses or for applying a calibration offset value.

***Note:** The offset value can be modified from the main window and is applied only when units of dB or dBm are selected.*

1. In the *Channel Setup* window, if necessary, select the channel for which you want to set an offset value.
2. Double-click with the right mouse button on the *Offset* edit box.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

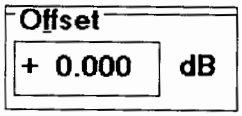


Figure 3-8. Offset Edit Box

3. Using the software keypad, enter an offset value, then choose **Enter**.

3.2.10 Adding and Deleting Wavelengths

The values contained in the λ list box (maximum of 25 values at the same time) determine which wavelengths are available during operation of the power meter. Measurements performed at wavelengths followed by a **c** (IQ-1500 only) will have a better accuracy (lower uncertainty). Wavelengths followed by a **c** cannot be added or deleted from the λ list box. Please refer to the Certificate of Calibration supplied with your power meter module for information about the specified wavelengths and measurement uncertainty.

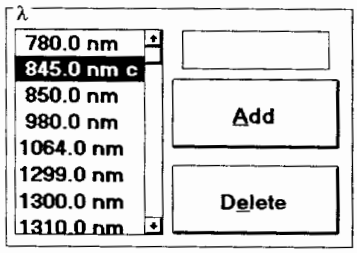


Figure 3-9. Adding and Deleting Wavelengths

To add a value to the λ list box

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1. In the *Channel Setup* window, double-click on the edit box above the [Add] button.
2. Using the software keypad, enter the wavelength value to be added.

Note: *In the case of the IQ-1500 Calibration Power Meter, any wavelength within the spectral range of the unit (depends on detector type) may be entered at 0.1 nm resolution.*

3. Choose [Add] to confirm the new wavelength.

➤ ***Tip****: When using an optional hardware keyboard, pressing the <Enter> key has the same effect as choosing* [Add].

To delete a value from the λ list box

1. In the *Channel Setup* window, scroll through the λ list box and highlight the wavelength to be deleted.
2. Choose [Delete].

3.3 Setting Wavelength

When performing accurate optical power measurements, it is important that the power meter be set to the correct wavelength. Ideally, the power meter wavelength should be set as close as possible to the wavelength of the optical source being used. To set the wavelength

1. In the main window, if necessary, select the channel for which you want to set the wavelength.
2. Open the λ list box.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

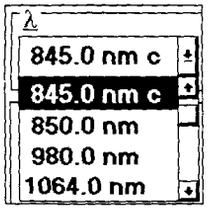


Figure 3-10. Setting Wavelength

Note: *The contents of the λ list box can be customized, see* Adding and Deleting Wavelengths, *on page 3-17.*

3. Click on the desired value. The λ list box will close, the selected value will be displayed, and measurements will be taken at the set wavelength.

The **c** beside a wavelength value indicates that measurements performed at this wavelength will have a better accuracy (lower uncertainty). Please refer to the Certificate of Calibration supplied with your power meter for information about the specified wavelengths and measurement uncertainty.

3.4 Power Measurements

Power measurements can be displayed in three different ways:

- absolute power
- relative power
- offset power (absolute or relative power plus an offset value)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Also, on the IQ-1100 and IQ-1500, you can ask for the displayed power measurement to be averaged or not. Extended measurement range is provided on the IQ-1100.

3.4.1 Absolute Power

When in absolute power display, measured values are displayed in either dBm or watt (pW, nW, µW, or mW), and the displayed value represents the absolute optical power reaching the detector (within specified uncertainty).

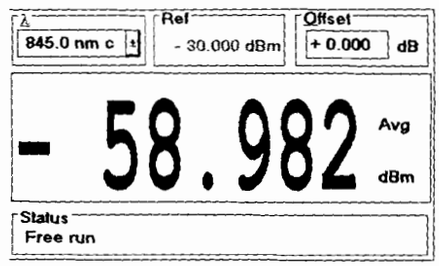


Figure 3-11. Absolute Power Display

To display absolute power

1. Select the desired channel, if necessary.
2. Select the appropriate wavelength.
3. Ensure that the offset value is 0.00 dB. If the *Offset* box contains a non-zero value, double-click the right mouse button on the box and enter 0.00 dB.
4. Depending on the desired display units, choose either F5 dBm or watt F6.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Note: *When displaying absolute power, the* **Ref** *value appears gray.*

3.4.2 Relative Power

Relative power can be positive or negative, and is equal to the absolute power minus a previously defined reference power. The example shown in Figure 3-12 is a case where the measured power is 30.123 dB higher than the reference value of -32.284 dBm. The absolute power is of -2.161 dBm.

Note: *Relative power is always displayed in dB.*

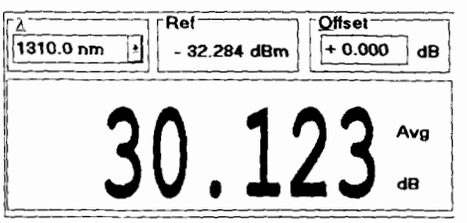


Figure 3-12. Relative Display Mode

In order to display meaningful relative power values, it is important to have an appropriate reference value.

Note: *A reference value is a power measurement; it is not a user-defined parameter (i.e. the reference cannot be entered by editing the value).*

To set a reference value

1. Using appropriate adapters and test jumpers, connect the optical circuit being referenced to a detector port.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. Select the appropriate channel, if necessary.
3. Select the appropriate wavelength.
4. Choose [F3 Ref].

The power meter will take a reference measurement and the value displayed in the **Ref** box will be updated to reflect the new reference. Once the reference measurement is performed, the power meter automatically displays relative power in dB. The reference value will be displayed until

- a new reference is taken,
- the wavelength is changed, or
- a different channel is selected (in the case of the IQ-1200).

You might want to switch from absolute power measurements to relative measurements and use a previously stored reference value.

1. Ensure that the offset value is 0.00 dB. If the *Offset* box contains a non-zero value, double-click the right mouse button on the box and enter 0.00 dB.
2. Select the desired channel.
3. Select the desired wavelength.
4. Choose [dB F4]. The display switches to relative mode where the value displayed is equal to the absolute power minus the reference power previously stored.

Note: *When displaying relative power, the* **Ref** *value appears in black. A reference value is retained for each wavelength.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

➤ ***Tip**: The reference value can be reset at any time by choosing* [F3 Ref].

3.4.3 Offset Power

An offset can be applied to any measurement that is displayed in either dB or dBm. The offset value, which can be positive or negative, is added to the measured power. This feature provides additional flexibility and can be useful when compensating for power gains or losses.

To use offset power display

1. Select the desired channel.
2. Select the appropriate wavelength.
3. Choose either [F5 dBm] or [dB F4], depending on the desired display units.
4. Double-click the right mouse button on the *Offset* edit box.

***Note:** The offset value can also be set from within the Channel Setup window.*

5. Using the software keypad, enter the offset value. Offset values between -99.999 dB and 99.999 dB can be entered.

***Note:** When the display units are in watts, the offset is not applied and the offset value appears gray.*

3.4.4 Averaged Measurement (IQ-1100 and IQ-1500)

In the main window, choose [F7 Avg] in order for the displayed power measurement to be averaged or not.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

When averaging is enabled, the eight most recent measurement samples are used to compute an unweighted average. This average is displayed as the measured value. **Avg.** will also be displayed to the right of the value, indicating that averaging is enabled.

3.4.5 Extended Measurement Range (IQ-1100 only)

The IQ-1100 has an extended absolute power measurement range up to -100 dBm. The following conditions must be observed:

1. F7 Avg must be selected.
2. Sampling rate must be 0.1 or 0.5 samples per second.
3. Resolution must be set to **Auto**.

When extended range capabilities are enabled, **Extended Range** appears in the *Status* box, at the bottom of the IQ-1100 main window.

3.5 Data Acquisition

The IQ Power Meter application offers flexible data management where both timed and conditional data acquisition are possible. Data acquisition is controlled from the *Acquisition Setup* window.

Note: *In addition to data acquisition parameters, wavelength and sampling rate can also be selected from within the* Acquisition Setup *window.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

To open the *Acquisition Setup* window, choose Acquisition from the main window.

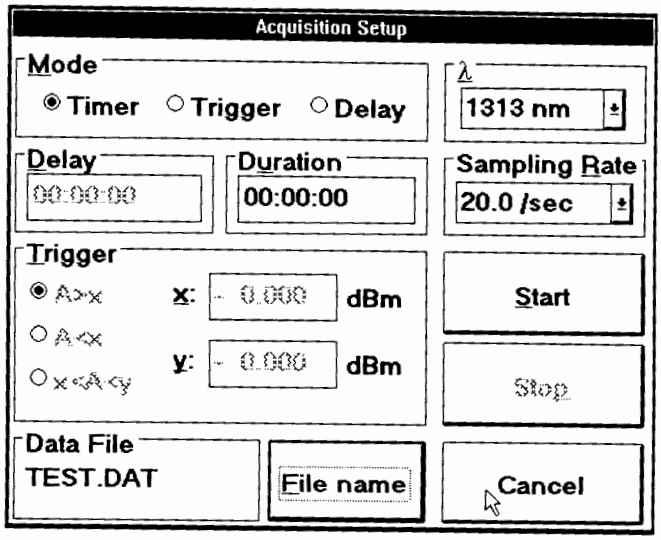


Figure 3-13. Acquisition Setup Window (IQ-1100 and IQ-1500)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

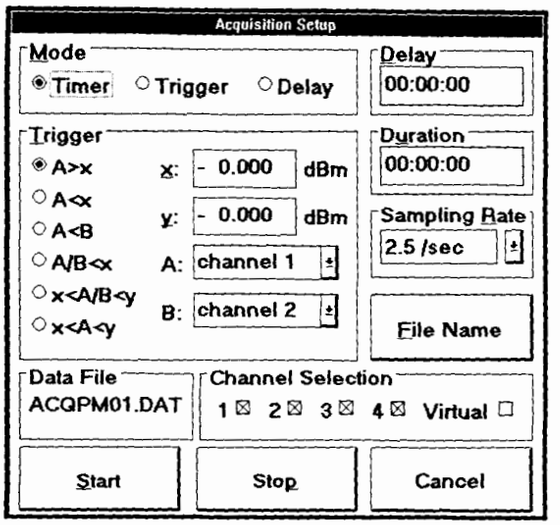


Figure 3-14. Acquisition Setup Window (IQ-1200)

Three acquisition methods are provided:

- timer
- trigger
- delay

In each case, measurements are taken at the selected sampling rate and saved to a user-specified data file. The size of the data files created during acquisition is proportional to the sampling rate and to the duration of the acquisition. Higher sampling rates and longer durations generate larger quantities of data. At the maximum sampling rate of 5 samples per second, approximately 100 bytes of data will be generated for each second of data acquisition.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

➤ ***Tip**: For long duration data acquisition, a low sampling rate will significantly save data storage space.*

3.5.1 Timer Acquisition Method

Timer acquisition starts as soon as [Start] is chosen and continues for the time specified in the *Duration* box. To use timer acquisition

1. From the main window, choose [Acquisition] to open the *Acquisition Setup* window, shown in Figure 3-13.
2. Select the desired sampling rate.
3. In the *Channel Selection* box (IQ-1200 only), select the channel(s) for which you want data to be acquired.
4. Click on the **Timer** radio button.
5. Double-click the right mouse button on the *Duration* edit box.
6. Using the software keypad, enter the duration. The format for duration is HH:MM:SS. Acquisition duration between 00:00:01 and 99:59:59 may be entered.
7. Choose [File name]. In the dialog box, enter the file name and path where data is to be saved.
8. Choose [Start]. The *Acquisition Setup* window will close and data recording will begin. During acquisition, the power meter main window will appear as shown below. From the figure, it can be noted that the function buttons are disabled, and **Acquiring** is displayed in the *Status* box.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

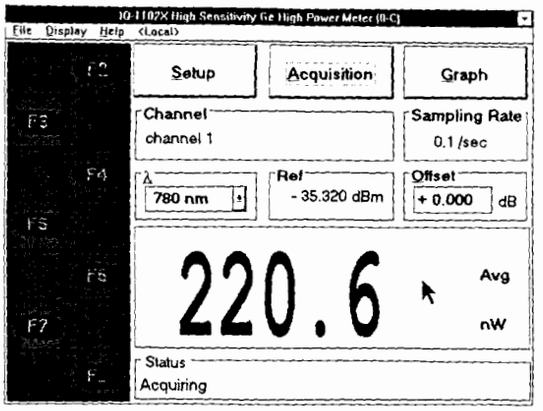


Figure 3-15. Main Window in Normal Mode during Data Acquisition

9. Data acquisition will continue for the specified duration.

Note: *Data acquisition can be terminated at any time by opening the Acquisition Setup window (choose* Acquisition *) and choosing* Stop .

3.5.2 Trigger Acquisition Method

Conditional data acquisition can be performed using trigger acquisition, where data recording begins when a specified condition is met, and continues for the time specified in the *Duration* box. Depending on your power meter module configuration, different trigger conditions are available. These conditions are explained in the following table.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

TRIGGER	DESCRIPTION
A > x	Acquisition will start when the measured power is greater than the specified x value.
A < x	Acquisition will start when the measured power is less than the specified x value.
A < B (IQ-1200)	Acquisition will start when the measured power of channel A is less than the measured power of channel B
A/B < x (IQ-1200)	Acquisition will start when measured power in either channel A **OR** channel B is less than a specified x value.
x < A/B < y (IQ-1200)	Acquisition will start when measured power in either channel A **OR** channel B falls outside a specified range (x > y). Acquisition will start when measured power in either channel A **OR** channel B falls inside a specified range (x < y).
x < A < y	Acquisition will start when the measured power falls outside the range if x > y. Acquisition will start when measured power falls inside the range if x < y.

Table 3-6. Data Acquisition Triggers

Note: *The trigger defines the condition for starting data acquisition. Once begun, acquisition will continue for the specified duration regardless of the measured power.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

To use trigger acquisition

1. From the main window, choose Acquisition to open the *Acquisition Setup* window.
2. Select the appropriate wavelength.
3. Select the desired sampling rate.
4. Click on the **Trigger** radio button.
5. Click on the appropriate trigger condition radio button.

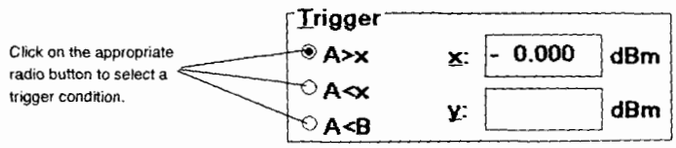


Figure 3-16. Trigger Condition Box

6. Enter the appropriate **x** and **y** values by double-clicking the right mouse button on the **x** or **y** edit box and using the software keypad to enter the value.

Note: *The x and y values are always defined in dBm.*

7. Select the channels (if applicable) to be taken as **A** and **B**.
8. Double-click the right mouse button on the *Duration* edit box.
9. Using the software keypad, enter the duration. The format for duration is HH:MM:SS. Acquisition duration between 00:00:01 and 99:59:59 may be entered.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

10. Choose [File name]. In the dialog box, enter the file name and path to which data is to be saved.
11. Choose [Start]. The *Acquisition Setup* window will close, and «Waiting for trigger or start time» will be displayed in the status box.
12. Data acquisition will start as soon as the specified trigger condition is met, and will continue for the specified duration.

Note: *Data acquisition can be terminated at any time by opening the Acquisition Setup window (choose* [Acquisition] *) and choosing the* [Stop] *button.*

3.5.3 Delay Acquisition Method

Delay acquisition starts a specified time after [Start] is chosen. The acquisition continues for the time specified in the **Duration** box. To use delay acquisition

1. From the main window, choose [Acquisition] to open the *Acquisition Setup* window.
2. Select the appropriate wavelength.
3. Select the desired sampling rate.
4. Click on the **Delay** radio button.
5. Double-click the right mouse button on the *Delay* edit box.
6. Using the software keypad, enter the delay. The format for delay is HH:MM:SS. Delay values between 00:00:01 and 99:59:59 may be entered.
7. Double-click the right mouse button on the *Duration* edit box.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

8. Using the software keypad, enter the duration. The format for duration is HH:MM:SS. Duration values between 00:00:01 and 99:59:59 may be entered.
9. Choose File name. In the dialog box, enter the filename and subdirectory to which the data is to be saved.
10. Choose Start. The *Acquisition Setup* window will close, and «Waiting for trigger or start time» will be displayed in the status box.
11. Data acquisition will start after the specified delay, and will continue for the specified duration.

Note: *Data acquisition can be terminated at any time by opening the Acquisition Setup window (choose* Acquisition *) and choosing* Stop.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.6 Consulting Data

Acquisition files are saved in text format. Data may be viewed or printed using any text editor or word processor. The file has data fields separated by tabs so that it can be easily imported into most popular spreadsheet programs.

Note: *The IQ-203 operating system has three text editors; WINDOWS Write, WINDOWS Notepad, and MS-DOS Editor.*

```
EXFO_FILE: ACQFILE PM  4 CHAN.
VERSION: 1.0

DATE: Tue Oct 10 1995
TIME: 16:09:28

CHANNEL: Channel 1  Channel 2  Channel 3 Channel 4
NAME:  channel 1 channel 2 channel 3 channel 4
LAMBDA: 1305 nm 1305 nm 1305 nm 1305 nm
OFFSET(dB):  +12.000  +02.000 +06.000 +00.000
REF.(dBm):  -30.000  -30.000  -30.000  -30.000
RATE:  2.5 /sec    2.5 /sec    2.5 /sec    2.5 /sec
UNITS:   dBm   Watt   dBm   dB
DIGITS:  2  2 1 2
AVRG: Off

Time(sec.)  channel 1   channel 2   channel 3   channel 4

  0.800      -036.50  +015.06E-09   -042.1      -018.32
  1.200      -036.50  +015.06E-09   -042.1      -018.31
  1.600      -036.50  +015.07E-09   -042.1      -018.31
  2.000      -036.50  +015.07E-09   -042.1      -018.31
  2.400      -036.51  +015.07E-09   -042.1      -018.31
  2.800      -036.51  +015.08E-09   -042.1      -018.30
  3.200      -036.53  +015.02E-09   -042.1      -018.32
  3.600      -036.53  +015.01E-09   -042.1      -018.32
  4.000      -036.53  +015.01E-09   -042.1      -018.33
```

Figure 3-17. Data Displayed by Text Editor

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

EXFO_FILE: ACQFILE.PM 4 CHAN.
VERSION: 1.0

DATE: Tue Oct 10 1995
TIME: 16:09:28

CHANNEL:	Channel 1	Channel 2	Channel 3	Channel 4
NAME:	channel 1	channel 2	channel 3	channel 4
LAMBDA:	1305 nm	1305 nm	1305 nm	1305 nm
OFFSET(dB):	12	2	6	0
REF.(dBm):	-30	-30	-30	-30
RATE:	2.5 /sec	2.5 /sec	2.5 /sec	2.5 /sec
UNITS:	dBm	Watt	dBm	dB
DIGITS:	2	2	1	2

AVRG: Off

Time(sec.)	channel 1	channel 2	channel 3	channel 4
0.8	-36.50	1.51E-08	-42.10	-18.32
1.2	-36.50	1.51E-08	-42.10	-18.31
1.6	-36.50	1.51E-08	-42.10	-18.31
2	-36.50	1.51E-08	-42.10	-18.31
2.4	-36.51	1.51E-08	-42.10	-18.31
2.8	-36.51	1.51E-08	-42.10	-18.30
3.2	-36.53	1.50E-08	-42.10	-18.32
3.6	-36.53	1.50E-08	-42.10	-18.32
4	-36.53	1.50E-08	-42.10	-18.33
4.4	-36.53	1.50E-08	-42.10	-18.33

Figure 3-18. Data into a Spreadsheet Program

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4 GRAPHICAL DISPLAY MODE

The graphical display mode simultaneously offers a real-time sampling display (graphical or tabular format) of up to 8 channels from different IQ power meter modules (IQ-1100-1200-1500). Other features include zoom, adjustable markers with automatic delta calculation, minimum and maximum alarm, tabular data display, and full printing capabilities.

4.1 Graphical Display Mode Window Description

The graphical display mode is accessed by choosing **Graph** from any *Normal Mode* main window.

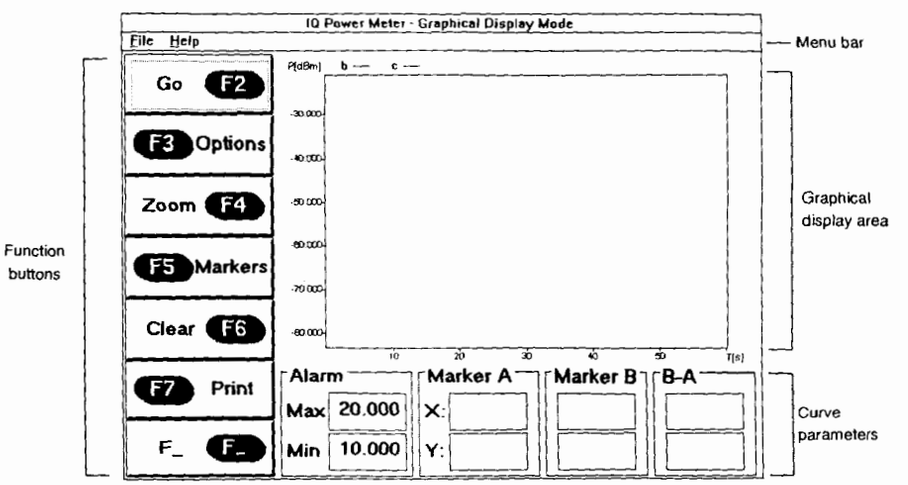


Figure 4-1. Graphical Display Mode Window

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The *Graphical Display Mode* window can be broken down into four sections:

- menu bar
- function buttons
- graphical display area
- curve parameters

4.1.1 Menu Bar

The menu bar is at the top of the main windows (see Figure 4-1). It contains pull down menus that are explained in the following table:

MENU	OPTION	FUNCTION
File	Exit	Exits the Graphical display mode and returns to the previously used IQ application.
Help	About Pmgraph	Opens a window which provides the following information: •software version •manufacturer address •technical assistance telephone numbers

Table 4-1. Main Window Pull-Down Menus

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.1.2 Function Buttons

The function buttons, along the left side of the *Graphical Display Mode* window (refer to Figure 4-1), are used for direct control of graphical display mode features.

BUTTON	DESCRIPTION
Go F2	Launches real-time sampling according to the parameters set in the *Options* window. The **Go** button changes to **Stop** when sampling is in progress.
Stop F2	Stops or pauses real-time sampling. Real-time sampling may be resumed by choosing **Go**.
F3 Options	Opens the *Options* window, from which the real-time sampling parameters may be configured (see Section 4.2).
Zoom F4	Accesses the zoom control buttons which allow for zooming in and out on the plotted curve(s) (see section 4.4).
F5 Markers	Accesses the marker control buttons which allow for moving the markers along the curve(s), in order to get precise curve data (power level vs. time) (see Section 4.6).
Clear F6	Clears the data displayed in the graphical display area.
F7 Print	Initiates printing of the displayed data (see Section 4.7).
F_ F_	Transfers control to the IQ-203 front panel function keys (refer to the *IQ-200 Optical Test System Instruction Manual*).

Table 4-2. Graphical Display Mode Window Function Buttons

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.1.3 Graphical Display Area

The graphical display area is in the middle of the *Graphical Display Mode* window (see Figure 4-1). It is where either the curve or the table is built and displayed, according to the parameters set in the *Options* window. Here are two examples showing typical power readings displayed in graphical and tabular formats.

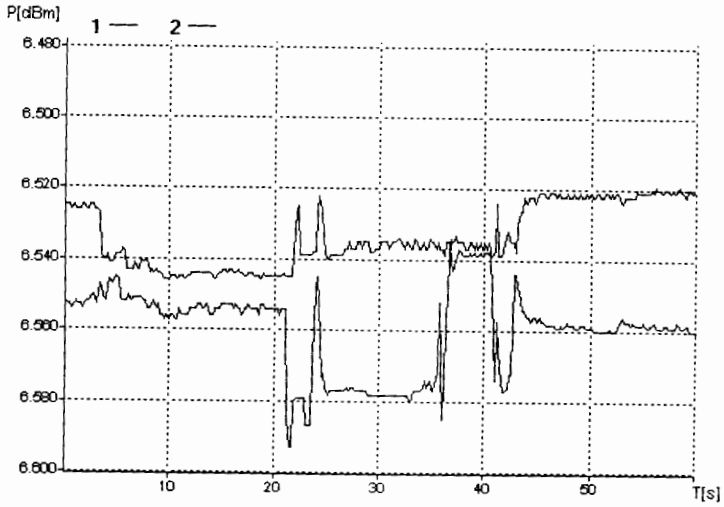


Figure 4-2. Two Curves in the Graphical Display Area

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

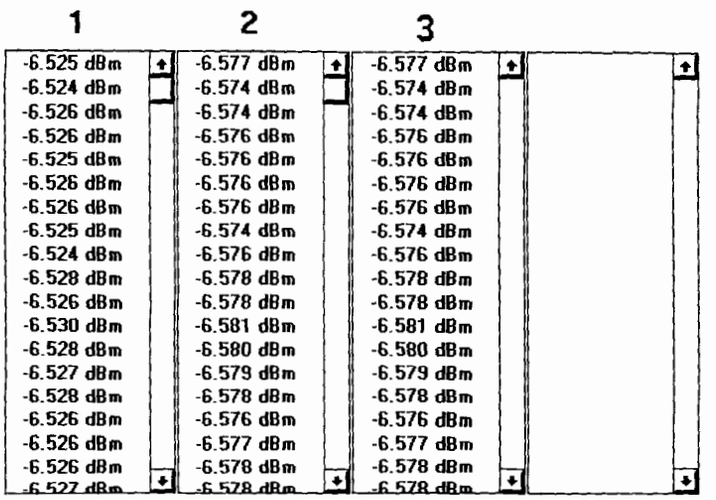


Figure 4-3. Three Channel Results in the Graphical Display Area

4.1.4 Curve Parameters

Alarm

The *Alarm* box, at the bottom of the *Graphical Display Mode* window, displays the maximum and minimum alarm thresholds previously set in the *Options* window. An audible or visual alarm is activated when power level on any of the displayed channels go above or below the set thresholds. As a visual alarm, the **Min** or **Max** indication in the *Alarm* box blinks when the alarm threshold is not respected. Please see Section 4.2.4 for more details on alarm settings.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Marker A

The *Marker A* box, at the bottom of the *Graphical Display Mode* window, gives the X and Y coordinates of the point crossed by marker A on the selected curve. Please see Section 4.6 for more details on markers usage.

Marker B

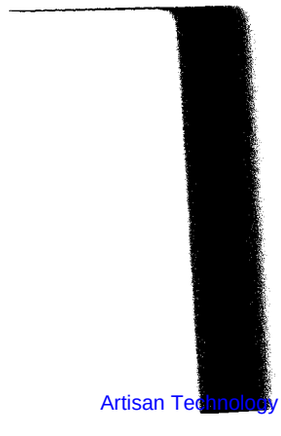
The *Marker B* box, at the bottom of the *Graphical Display Mode* window, gives the X and Y coordinates of the point crossed by marker B on the selected curve. Please see Section 4.6 for more details on markers usage.

B-A

The *B-A* box, at the bottom of the *Graphical Display Mode* window, gives the difference between the coordinates of the points crossed by marker A and B on the selected curve. Please refer to Section 4.6 for more details on markers usage.

4.2 Options Window Description

It is from the *Options* window that all parameters for real-time curve plotting and table building can be set. The *Options* window is accessed by choosing **Options** in the *Graphical Display Mode* window.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

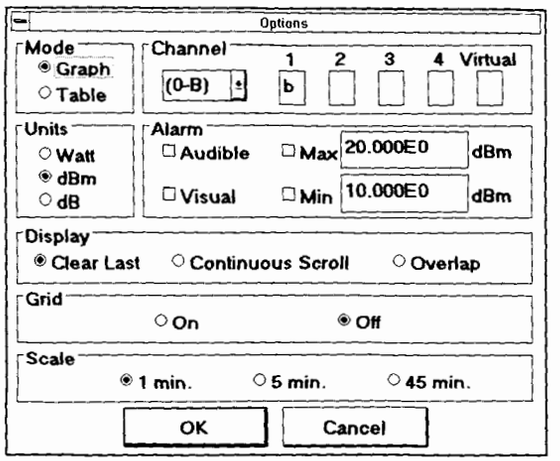


Figure 4-4. Options Window

Once all desired parameters are set in the *Options* window, choose **OK** to confirm your choices or **Cancel** to exit the *Options* window without applying the choices.

4.2.1 Mode

Select *Graph* to display the real-time power readings as a curve (one curve per channel). Select *Table* to display the real-time power readings in a table (one column per channel).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.2.2 Channel

Readings from up to eight channels can be displayed on a curve while readings from up to four channels can be displayed in a table. Channels must be selected and attributed a character in order for their readings to be displayed.

1. Scroll through the list of available IQ Power Meter modules and select one.

   The position of an IQ module is identified both with a number and a letter. The number indicates what unit the module is inserted in (0 for the IQ-203 Mainframe and 1 to 4 for the IQ-206 Expansion Units connected to the Mainframe). The letter indicates what slot the module is inserted in.

Note: *Only the IQ power meter modules whose application is set to the same measurement units as those specified in the* **Units** *box (see Section 4.2.3) will be listed.*

2. Depending on the number of channels available on the selected module, the **1**, **2**, **3**, **4**, and **Virtual** boxes will activate.
3. To activate a channel for display, type a character in the corresponding box. This character will be used in the graphical display area to identify the channel displayed.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

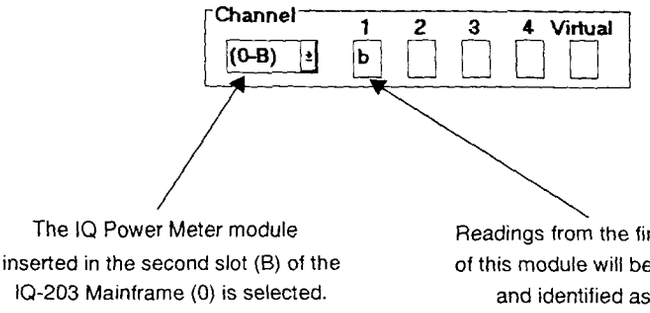


Figure 4-5. Channel Selection for Real-Time Sampling

Repeat for each desired channel.

4.2.3 Units

Select the measurement units in which the readings will be displayed (on the Y axis).

Note: *The measurement units chosen in the Options window must be the same as those selected in the corresponding power meter main window.*

4.2.4 Alarm

Alarms can be set in order to warn you when power levels of either channel go below or above set thresholds or outside specified limits.

First enter maximum and/or minimum alarm threshold values. A white line will appear in the graphic to illustrate the threshold.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Then, if desired, select audible and/or visual alarm. Audible alarm consists of small beeps generated by the computer. As a visual alarm, the **Min** and/or **Max** indication in the *Graphical Display Mode* window will blink.

4.2.5 Display

Three curve plotting displays can be selected:

•Clear last	After having gone through a complete sweep of a time scale, curve plotting begins again at the zero point. The previous curve is overwritten as a new one is plotted. See Section 4.2.7 for details on time scales.
•Continuous Scroll	After having gone through a complete sweep of a time scale, curve plotting keeps going on the same curve. Only the portion of the curve plotted within the last time scale is kept in memory and displayed. See Section 4.2.7 for details on time scales.
•Overlap	After a curve is plotted, it remains in the graphical display area. The new curve begins at the zero point. Eventually, multiple sweeps will be displayed on the same screen.

Notice that a curser moves along the X axis as curve plotting progresses.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.2.6 Grid

A grid can be displayed over the curve(s) in the graphical display area so it is easier to refer to the X and Y axes from a point on a curve. To turn the grid on or off, choose the appropriate radio button in the *Options* window. The grid is only displayed when sampling is stopped or paused.

4.2.7 Scale

The scale setting determines the length of the X axis (time) when the zoom control is set to full view. It therefore determines how long it will take for the curve plotting process to do a complete sweep of the display (in full view). Three choices are available in the *Options* window: 1, 5, and 45 minutes.

4.3 Refresh Rate

In addition to all parameters adjustable from the *Options* window, the refresh rate can be set at any time by double-clicking anywhere in the graphical display area with the right mouse button. This opens the *Refresh Rate* window.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

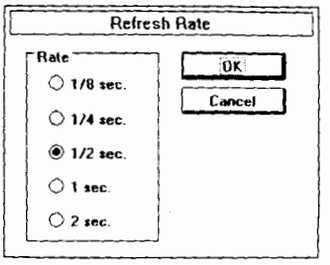


Figure 4-6. Refresh Rate Window

The refresh rate represents the number of times per second the graphical display area will be updated during curve plotting. It is not related to the number of sampling points used to build the curve (sampling rate). The sampling rate is set independently for each channel in the corresponding application (see Section 3.2.8).

Note: *Accessing the* Refresh Rate *window during curve plotting momentarily pauses plotting.*

➤ ***Tip****: A slower refresh rate can be useful to reduce the display flicker when using lower performance computers.*

4.4 Zoom Control

During curve plotting and once the curve is plotted, it is possible to zoom in and out on any portion of a curve. X and Y axes are zoomed in and out independently.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Choose the **Zoom** button, on the left side of the *Graphical Display Mode* window. This makes the zoom control buttons appear.

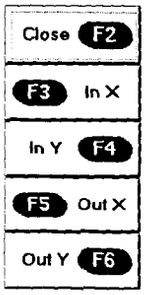


Figure 4-7. Zoom Control Buttons

To hide the zoom control buttons, choose **Close**.

4.5 Scrolling

During curve plotting and once the curve is plotted, it is possible to move the visible portion of the curve left, right, up, and down by clicking on the corresponding edge of the graphical display area. Clicking in the corners of the graphical display area moves the display diagonally.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

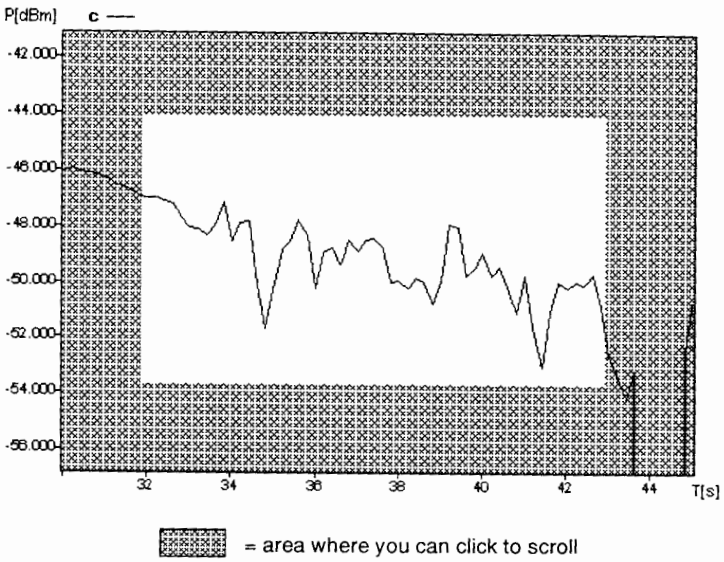


Figure 4-8. Scrolling

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.6 Marker Control

The markers determine the exact coordinates of a particular point on a curve. You can also find the difference between the coordinates of two points on a curve. To use the marker feature, choose the **Markers** button, in the *Graphical Display Mode* window.

The marker control buttons will appear along the left side of the *Graphical Display Mode* window.

- The A and B markers appear in the graphical display area.
- The darkened coordinates box indicates the active marker. In order to move a marker, it must be active.
- The Marker A box gives the coordinates of the point met by marker A on the selected curve.
- The Marker B box gives the coordinates of the point met by marker B on the selected curve.
- The B-A box gives the difference between the coordinates of the points met by marker A and B on the selected curve.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

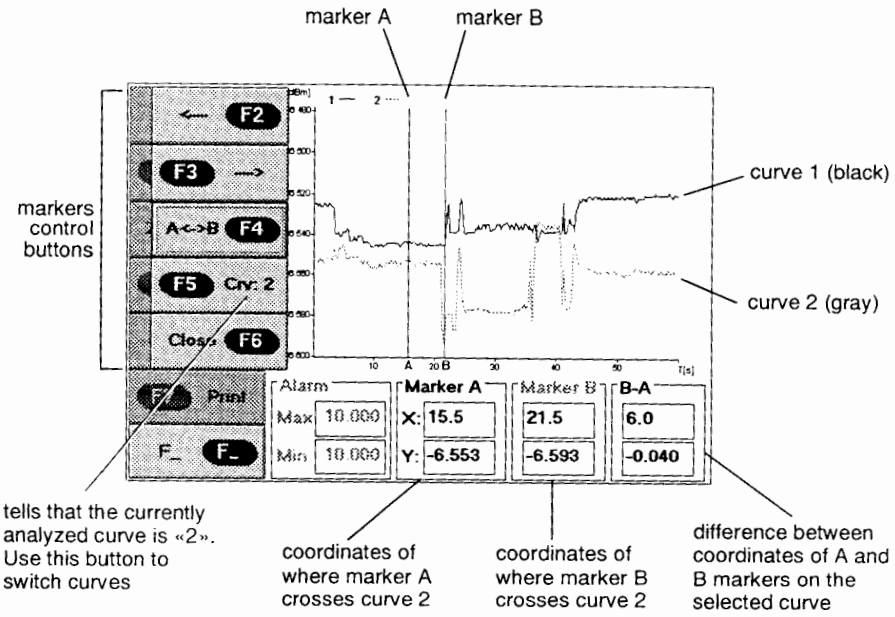


Figure 4-9. Marker Control Display

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

BUTTON	DESCRIPTION
<— F2	Moves the active marker left.
F3 —>	Moves the active marker right.
A<->B F4	Switches the active marker between A and B.
F5 Crv: b	Switches between the available curves as to select the one that will be analyzed.
Close F6	Closes the marker feature.

Table 4-3. Marker Control Buttons

Note: *Markers will only move from one real sampling point to another on the curve. A real sampling point corresponds to a power measurement that has actually been taken by the power meter. The number of real sampling points on a curve depends on the sampling rate set in the corres ponding application* (see Section 3.2.8). *A maximum of 5 sampling points per second can be plotted by the graphical display mode*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.7 Printing Graphics

Once plotted, curves can be printed on any normal printer connected to the IQ system. Choose **Print** to open the *Print View* window.

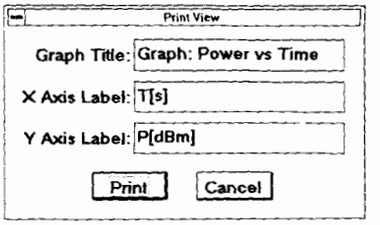


Figure 4-10. Print View Window

The *Print View* window allows you to set

- the graph title
- the X axis label
- the Y axis label

From the *Print View* window, choose **Print** when ready to confirm the action or **Cancel** to return to *Graphical Display Mode* window.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5 CALIBRATION MODE (IQ-1500 ONLY)

The IQ-1500 can be used as a calibration power meter. In the Calibration mode, the user interface provides a comprehensive calibration program that enables you to perform an optical calibration on a wide variety of optical power meters. In addition to a systematic step-by-step approach, the software allows an experienced user to manually perform the calibration. This section explains how to operate the IQ-1500 in Calibration mode.

To toggle between Normal mode and Calibration mode, select either option from the *Mode* menu, at the top of the main window.

5.1 Main Window Description

The main window in Calibration mode can be broken down into four sections:

- title bar and menu bar
- function buttons
- parameter definition buttons
- data and status display

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

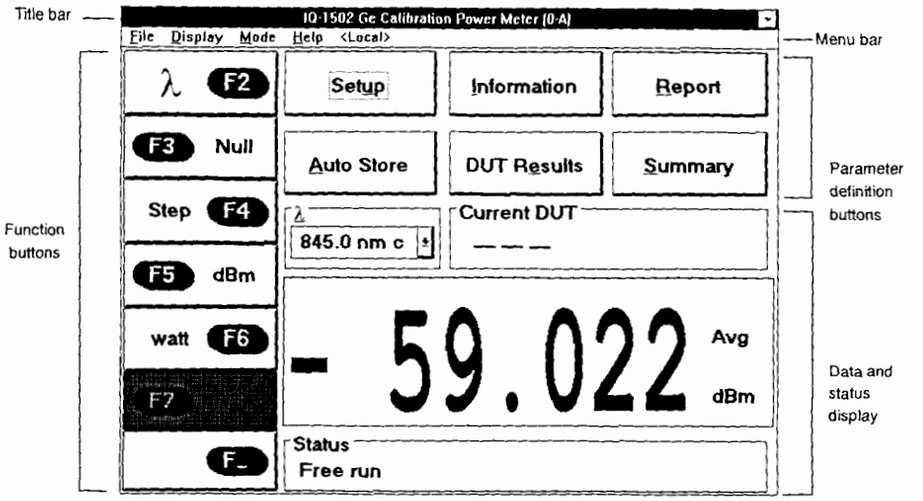


Figure 5-1. Main Window - Calibration Mode

5.1.1 Title Bar and Menu Bar

The main window title bar and menu bar are the same either in Normal mode or in Calibration mode. Please refer to Section 3.1.1 for a complete description of these two main window items.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.1.2 Function Buttons

The function buttons, along the left side of the main window (see Figure 5-1), are used for direct control of the calibration power meter when in the Calibration mode.

BUTTON	DESCRIPTION
λ F2	Switches to the next wavelength as defined by the contents of the λ list box (see Section 3.3).
F3 Null	Performs internal offset null measurement (see Section 3.2.4).
Step F4	Initiates the step-by-step procedure of the Calibration mode (see Section 5.2).
F5 dBm	Sets the calibration units to dBm.
Watt F6	Sets the calibration units to watt.
F_	Transfers control to the IQ-203 front panel function keys (refer to the *IQ-200 Optical Test System Instruction Manual*).

Table 5-1. Function Buttons - Calibration Mode

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.1.3 Parameter Definition Buttons

Choosing any of the parameter definition buttons opens a window permitting the definition and customization of various operating parameters. The following table describes the function of these buttons.

BUTTON	DESCRIPTION
Setup	Opens the *Channel Setup* window, allowing to customize specific channel parameters (see Section 3.2).
Information	Opens the *Calibration Information* window, allowing to enter all necessary information as to produce a detailed Report of Calibration (see Section 5.4).
Report	Opens the *Report* window, allowing to print a Report of Calibration (see Section 5.8).
Auto Store	Opens the *Auto Store* window, allowing to take a series of power measurements (see Section 5.5).
DUT Results	Opens the *DUT Results* window, allowing to enter DUT power measurement values (see Section 5.6).
Summary	Opens the *Calibration Summary* window, allowing to view calibration results (see Section 5.7).

Table 5-2. Parameter Definition Buttons

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.1.4 Data and Status Display in Calibration Mode

The data and status display, shown in Figure 5-1, comprises list boxes, edit boxes, and display boxes. A description of these various screen components is provided in the following table.

BOX	DESCRIPTION
λ	Displays the currently selected wavelength. ⇒ Open the list box to select a different wavelength.
Current DUT	Displays the current device under test (DUT) which was selected in the *Calibration Information* window.
Display	Displays power readings in dBm, dB, or watt (pW, nW, µW, or mW). When a dashed line (-------) is displayed, the power level is below the minimum power that can be measured. When a crossed line (+++++++) is displayed, the power level is over the maximum power that can be measured.
Status	Displays the current IQ-1500 status. • **Free run** - no data acquisition is in progress. • **Waiting for trigger or start time** - data acquisition will begin after a specified time or condition. • **Acquiring** - data acquisition is in progress. • **Processing...** - the IQ-203 is processing the latest commands. • **Stabilizing...** - The temperature of the module components is stabilizing.

Table 5-3. Data and Status Boxes in Calibration Mode

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.2 Step-by-Step Calibration Procedure

Selecting the step-by-step function, which is available only in the Calibration mode, initiates a systematic step-by-step calibration procedure. The calibration procedure is divided into the following six steps:

- setup
- information
- null
- calibration
- save
- report

To begin the step-by-step calibration procedure

1. Choose [Step F4] from the main window in Calibration mode.
2. Choose [OK] from the step-by-step *Setup* window.

As each step is completed, the software will automatically sequence to the next step. The step-by-step procedure can be stopped at any moment by choosing [Cancel] in any of the step-by-step procedure windows.

Figure 5-2 illustrates the first window of the step-by-step procedure. If you press [OK], the *Channel Setup* window will appear. See Section 5.3, *Channel Setup* for further information.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

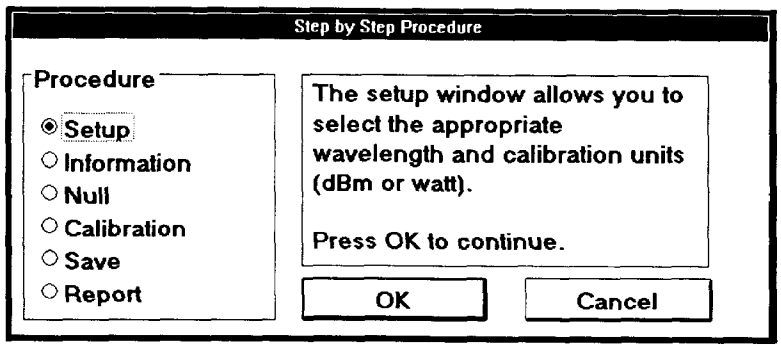


Figure 5-2. Step-by-Step Procedure (Setup)

Figure 5-3 shows the second window of the step-by-step procedure. Pressing [OK] will open the *Calibration Information* window. Refer to Section 5.4, *Calibration Information* for further information.

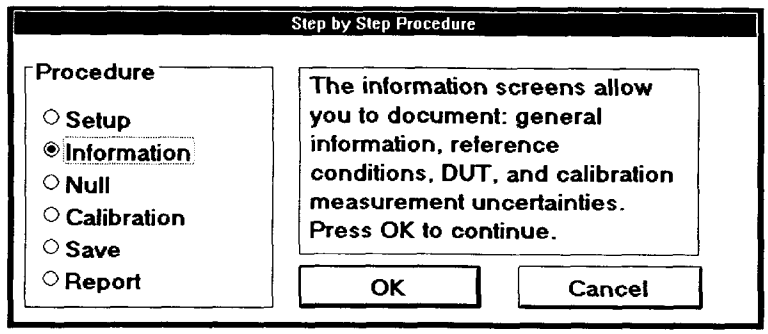


Figure 5-3. Step-by-Step Procedure (Information)

Nulling of the internal offsets can be directly performed by pressing [OK] in the third window of the step-by-step procedure window, as illustrated in Figure 5-4.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

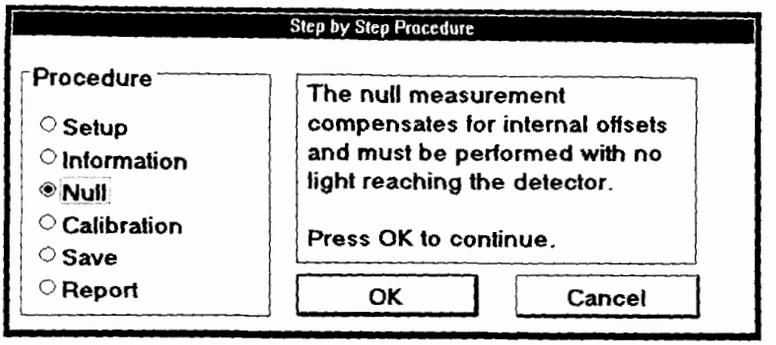


Figure 5-4. Step-by-Step Procedure (Null)

Figure 5-5 illustrates the fourth window of the step-by-step procedure. If you press OK, the *Auto Store* and the *DUT Results* windows will alternatively appear. Refer to Section 5.5, *Auto Store* and Section 5.6, *DUT Results*.

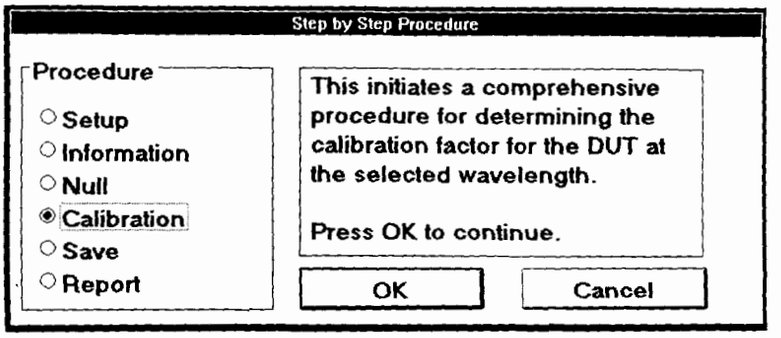


Figure 5-5. Step-by-Step Procedure (Calibration)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

After the calibration is performed, the window illustrated in Figure 5-6 will open. This will allow you to save the calibration data to a file.

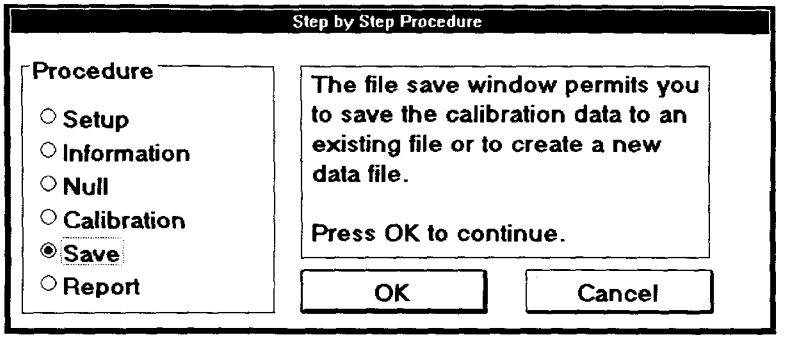


Figure 5-6. Step-by-Step Procedure (Save)

Finally, the last window of the step-by-step procedure will appear, as illustrated in Figure 5-7. Pressing [OK] will take you to the *Report* window. Refer to Section 5.8, *Printing a Report of Calibration* for further information.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

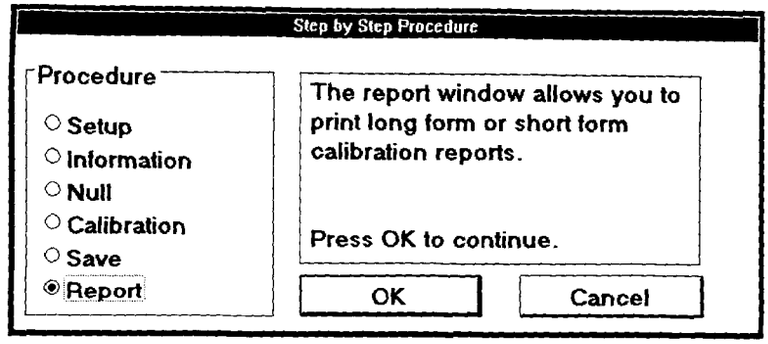


Figure 5-7. Step-by-Step Procedure (Report)

The step-by-step procedure is ideal for users unfamiliar with the calibration procedure or for any user looking for a repeatable, systematic approach. For experienced users, all the steps can be directly accessed from the main window.

Following is a summary of the calibration procedure:

1. Select the wavelength and units (watt or dBm) using the *Channel Setup* window.
2. Enter the general information, the information about the device under test (DUT), the reference conditions, and the measurement uncertainties using the *Calibration Information* window.
3. Perform the required number of measurements using alternatively the **Auto Store** (refer to Section 5.5) and **DUT Results** functions (see Section 5.6).
4. Verify the results through the **Calibration Summary** function (see Section 5.7).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5. Print a report using the **Report** function (see Section 5.8).

5.3 Channel Setup

In Calibration mode, the wavelength and measurement units are selected from the *Channel Setup* window (shown below). There are two ways to access the window.

- Press [Setup] in the main window in Calibration mode.
- Press [Step F4] in the main window in Calibration mode and follow the instructions.

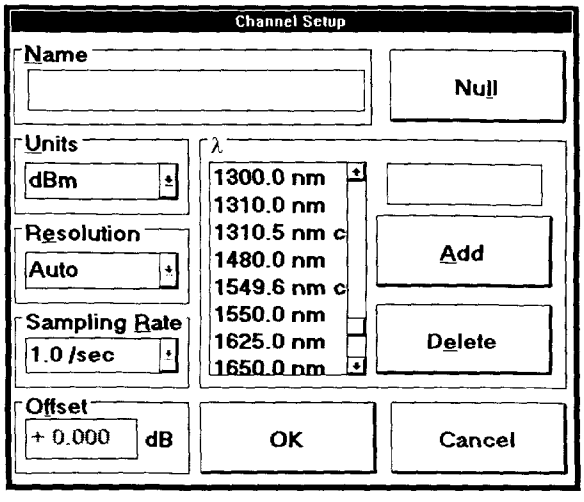


Figure 5-8. Channel Setup Window

Select the desired wavelength by highlighting the appropriate value. If the desired value is not in the list, enter the value in the edit box provided

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

and choose [Add]. To select the calibration units, open the unit list box and select dBm or watt.

Note: *To ensure the optimum calibration configuration, the resolution, sampling rate, and offset cannot be modified when the IQ-1500 is used in Calibration mode.*

5.4 Calibration Information

In order to print a detailed *Report of Calibration* and to calculate the calibration factor and the total uncertainty, the software requires the following information:

- general information
- DUT information
- reference conditions
- uncertainties

This information is entered in the *Calibration Information* window, which can be opened by pressing [Information] in the main window in Calibration mode or from the step-by-step procedure. The four pages of the *Calibration Information* window are shown in Figure 5-9 to Figure 5-12.

The DUT list box at the top of the window identifies the current DUT. Pressing [▼] will show the DUTs that have been tested and that are kept in memory. Selecting **new** in the pull down menu will tell the module that you are identifying a DUT that has never been calibrated.

Pressing [OK] on the top right corner of the window will take you back to the main window and save the data. Pressing [Cancel] returns to

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

the main window without saving the modifications made to the calibration information window.

Information is entered by selecting each of the four pages as described in Sections 5.4.1 to 5.4.4.

5.4.1 General Information

The *General* page contains general information about the user and equipment. Table 5-4 describes the information that should be entered in the *General* page.

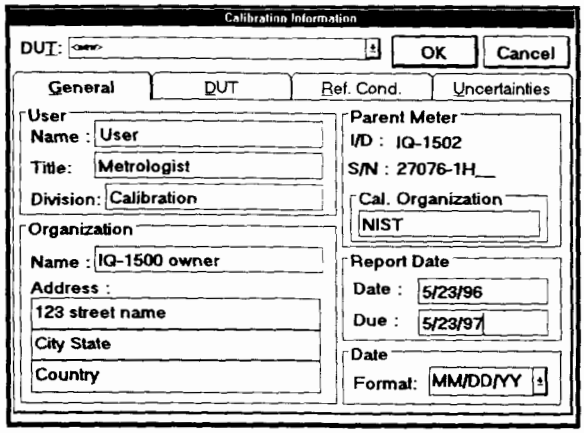


Figure 5-9. General Information Page

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

FUNCTION		DESCRIPTION
User	Name	name of the person performing the calibration
	Title	title of the person performing the calibration
	Division	division of IQ-1500 owner organization for which the user works
Organization	Name	name of IQ-1500 owner organization
	Address	address of IQ-1500 owner organization
Parent Meter	I/D	type of calibration power meter (automatically entered)
	S/N	serial number of the IQ-1500 used for the calibration (automatically entered)
	Cal. Organization	name of the organization that calibrated the IQ-1500 (e.g: NIST, EXFO)
Report date	Date	date of the beginning of the calibration
	Due	due date for the next calibration
Date format		format of the calibration date for clarity

Table 5-4. General Information Page Description

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.4.2 Device Under Test (DUT) Information

The *DUT* page, shown in Figure 5-10, contains information identifying the power meter being calibrated (DUT). Table 5-5 describes the information that should be entered in the *DUT* page.

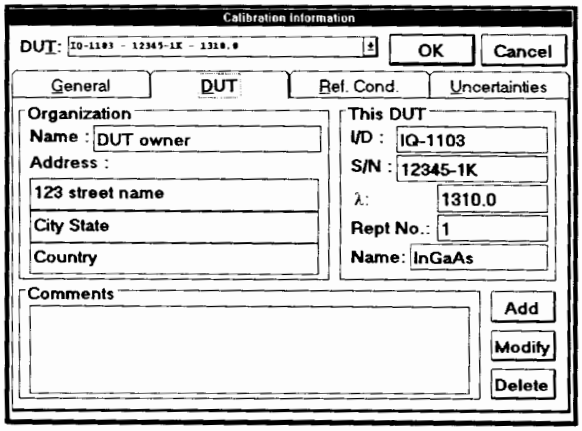


Figure 5-10. Device Under Test (DUT) Page.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

FUNCTION		DESCRIPTION
Organization	Name	Indicates the name of the organization owning the DUT.
	Address	Indicates the address of the organization owning the DUT.
Comments		Additional comments that may be helpful in documenting the calibration (this field of information does not appear in the *Report of Calibration*).
This DUT	I/D	Indicates the DUT part number.
	S/N	Indicates the DUT serial number.
	λ	Indicates the DUT wavelength setting. (It can be slightly different from the source wavelength.)
	Rept No.	Indicates the Report of Calibration number that will be on the first page of the report.
	Name	Precisely identifies the DUT.
Add		Adds a DUT to the DUT pull down list.
Modify		Modifies the information about a DUT.
Delete		Deletes a DUT from the DUT list.

Table 5-5. DUT Page Description

The information displayed in the *This DUT* group box is associated with the DUT identified at the top of the window. The information displayed in

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

the *Organization* and *Comments* group boxes is common to all the DUTs with the same I/D and S/N.

To add a DUT to the DUT list

1. Select <new> in the DUT list box at the top of the window.
2. Enter the information about the new DUT and press [Add].

To modify DUT information

1. Select the DUT you want to make changes to in the DUT list box located at the top of the *Calibration Information* window.
2. Make the appropriate changes in the *DUT* page.
3. Press [Modify] to confirm the changes.

Note: *The DUT you want to modify must already be in the DUT list box. Otherwise, you need to add the DUT and modify it later.*

To delete a DUT from the DUT list box

1. Select the DUT you want to delete in the DUT list box at the top of the window.
2. Press [Delete].

Note: *If you press* [Cancel], *the changes you made will not be saved.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.4.3 Reference Conditions

The *Reference Conditions* page, shown in Figure 5-11, contains all the information about the reference conditions at which each calibration is performed as well as information about sources used for calibrations. Table 5-6 describes the information that should be entered in the *Reference Conditions* page.

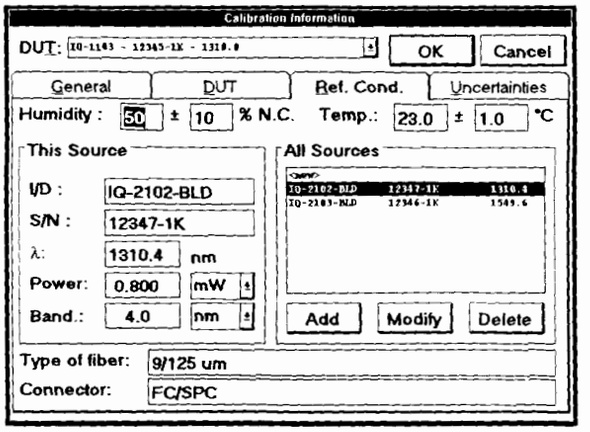


Figure 5-11. Reference Conditions Page

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

FUNCTION		DESCRIPTION
Humidity		Indicates the relative humidity during the calibration.
Humidity Error		Indicates the uncertainty on the measure and/or variation of the relative humidity during the calibration.
Temperature		Indicates the ambient temperature during the calibration.
Temperature Error		Indicates the uncertainty on the measure and/or the variation of the temperature during the calibration.
This Source	I/D	Indicates the type of source used for the current calibration.
	S/N	Indicates the serial number of the source.
	Power	Indicates the power of the source. The measurement units can be selected (mW, µW, nW, and dBm).
	λ	Indicates the wavelength of the source. If a source module emits at more than one wavelength and if different wavelengths are used, the source will appear several times in the source list with different wavelengths.
	Bandwidth	Indicates the source bandwidth (FWHM) in nm or MHz.

Table 5-6. Reference Conditions Page Description (part 1 of 2)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

FUNCTION		DESCRIPTION
All Sources	Add	Contains a list of all sources in the current file.
	Modify	Allows you to modify the information about a source used for the calibration.
	Delete	Allows you to delete a source from the list.
Type of fiber		Indicates the type of fiber used for the calibration.
Connector		Indicates the type of connector used for the calibration.

Table 5-6. Reference Conditions Page Description (part 2 of 2)

Note: *It is very important to give information as accurate as possible to obtain a valid report.*

The information displayed in the *This Source* group box is associated with the source highlighted in the *All Sources* list box. The temperature and humidity information is associated with the current calibration procedure.

To add a source to the source list

1. Enter the information about the new source.
2. Press **Add**.

To modify information about a source

1. Select the source you want to modify in the source list box.
2. Make the appropriate changes in the desired entry boxes.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3. Press [Modify] to activate the changes.

Note: *The source wavelength cannot be modified.*

To delete a source from the source list box

1. Select the source you want to delete in the source list box.
2. Press [Delete].

Note: *If you press [Cancel], the changes you have done since the last time you saved will not be recorded.*

5.4.4 Uncertainties Entry

The *Uncertainties* page, shown in Figure 5-12, like the three previous pages, must be filled out before performing the calibration. It is especially important to give accurate and precise data in this window if you want to obtain accurate uncertainty calibration calculations. This step is not compulsory in order to perform the calibration. However, if you need the uncertainties calculated, follow the instructions very carefully.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

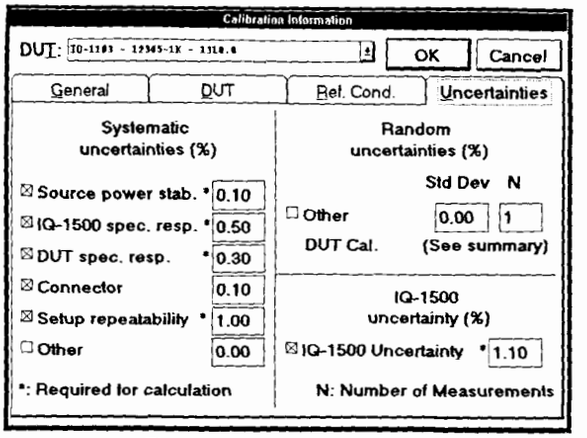


Figure 5-12. Uncertainties Page

To establish the total uncertainty, the uncertainty components are divided into the following:

- Systematic uncertainties determined by scientific judgement.
- Random uncertainties statistically determined from a series of measurements.
- The IQ-1500 uncertainty.

The systematic uncertainty components are assumed to be independent and have rectangular distributions. The following sources of information may be helpful in evaluating these systematic uncertainties:

- previous measurement data
- manufacturer's specifications
- data provided in calibration and other reports

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The random uncertainties are also assumed to be independent but are normally distributed; therefore, they can be estimated by performing a series of measurements and calculating a standard deviation.

The total uncertainty is calculated by adding (using the root of the sum of the squares) the systematic, the random, and the IQ-1500 uncertainties and multiplying the result by a factor of two to have a confidence level of 95%, as shown in Equation 5-1.

$$U_t = 2 \times \sqrt{\sum_i \left(\frac{U^2_{si}}{3}\right) + \sum_i \left(\frac{U^2_{ri}}{N}\right) + \left(\frac{U_{1500}}{2}\right)^2} \qquad \textit{Eq. 5-1}$$

where U_t = total uncertainty, U_{si} = systematic uncertainties, U_{ri} = random uncertainties, and U_{1500} = IQ-1500 calibration uncertainty.

Some of the error sources shown in Figure 5-12 are labelled with an asterisk (*). The asterisk indicates that the error source must be entered (and the check box selected) in order to have a total uncertainty calculation. If all the mandatory uncertainties are not entered, the software will not compute a total uncertainty because it could be underestimated.

The mandatory systematic uncertainties are

- source power stability
- IQ-1500 spectral response
- DUT spectral response
- setup repeatability

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The mandatory random uncertainty is

- IQ-1500 uncertainty

The remaining uncertainties are optional but in order to have the best results possible, all uncertainties must be considered.

Systematic Uncertainties

This section describes the systematic uncertainties that have to be estimated. All the entries must be the halfwidth, U_{si}, of a rectangular distribution from $-U_{si}$ to $+U_{si}$, in percent.

The **source power stability** is very important since the calibration is sequential, that is, measurements are taken first on the IQ-1500 and then on the power meter under test (DUT). This first error source can be evaluated by measuring the variation of the source power on one power meter over the time of calibration at one wavelength, about 30 seconds.

The **IQ-1500 spectral response** slope, in %/nm, around the wavelength of the source influences the calibration because of the uncertainty in the exact knowledge of the wavelength of the source. If not already known, the slope can be calculated using the following procedure:

1. With stable light illuminating the detector, set the IQ-1500 to the wavelength of the source, for instance 1550.0 nm, and record the displayed power, for instance 1.000 mW.
2. Increase the wavelength of the IQ-1500 by the uncertainty of the wavelength of the source, for instance if ±0.5 nm, set 1550.5 nm.
3. Record the second displayed power, for instance 1.005 mW.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4. Calculate the slope. In this case, the variation is (1.005-1.000)/ (1.000*0.5 nm) = 0.5%/0.5 nm = 1%/nm; the error is then 0.5%.

The **DUT spectral response** slope has a similar effect. It can be evaluated the same way if the spectral resolution of the DUT is also 0.1 nm. If not, an estimate can be obtained by setting the second wavelength as close as possible, for instance, 1540 nm. The evaluation will then be less precise, and judgment is important in order to have a good estimation.

If a different fiber than the one used for the calibration of the IQ-1500 is used, a large error can occur especially because of the connector. Even though the same fiber is used, the repeatability of the connection on both power meters must be measured and taken into account.

The **setup repeatability** also has to be measured and recorded. Movements of the fibers are mainly responsible for this error source. If the fiber has to be twisted between the IQ-1500 and the DUT, this effect has to be measured.

Note: *APC connectors should be avoided at the detector port because of their sensitivity to polarization.*

In addition, any other systematic error may be entered and included in the total uncertainty calculation.

Random Uncertainties

A random uncertainty is characterized by making a series of N measurements and calculating the standard deviation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Any error source of this type must be indicated in the other line with N being the number of measurements.

The standard deviation of the calibration factor for the DUT is automatically calculated and displayed in the *Calibration Information* window.

IQ-1500 Uncertainty

It is important here to indicate the uncertainty of the calibration of the IQ-1500 found in the *Report of Calibration* provided with the IQ-1500 Calibration Power Meter. It must be at a 95% (2 σ) confidence level. If not, correct the value to 2 σ confidence level. For instance, if the confidence level is specified at 68% (1 σ), then multiply the uncertainty by a factor of two.

5.5 Auto Store

The auto store function allows you to take a series of power measurements on the IQ-1500. You can specify the number of power measurements you want to be taken (M) and the interval of time (Delay) between each measurement. The software automatically calculates and displays the mean power (Mean) and the standard deviation (Std. dev.).

The *Auto Store* window, shown in Figure 5-13, is accessed by pressing Auto Store or from the step-by-step procedure.

The auto store function has two main purposes.

- The auto store function facilitates repetitive power measurements.
- The auto store function calculates the standard deviation of the power

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

measurements taken on the IQ-1500. This value is a good indication of the stability of the source used for the calibration. When the standard deviation exceeds 1%, a message will appear warning that the source might not be stable enough.

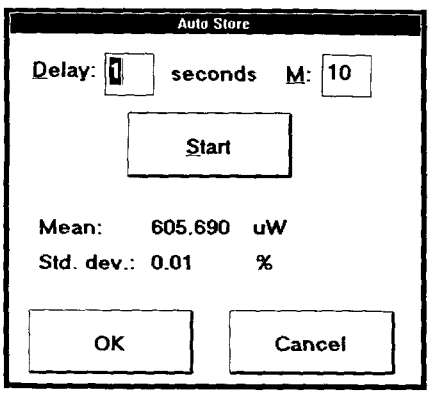


Figure 5-13. Auto Store Window

5.6 DUT Results

After power measurements have been taken on the IQ-1500, they have to be taken on the DUT. Since the IQ-1500 is designed to calibrate any optical power meter, the DUT power measurements are entered manually. The DUT power measurements are entered in the *DUT Results* window, shown in Figure 5-14. This window is accessed by pressing DUT Results or from the step-by-step procedure.The DUT power measurement value can either be in dBm or in watt.

Note: *It is very important to select the correct measurement units.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

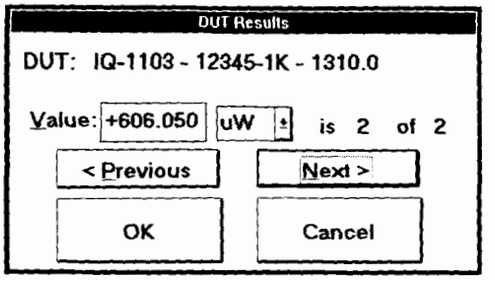


Figure 5-14. DUT Results Window

To enter a DUT power measurement value

1. Refer to the DUT display and read the power value.
2. Go back to the DUT results window of the IQ-1500 and enter the value seen on the DUT.
3. Select the proper measurement units.
4. Choose [Next >] to record the value.
5. Repeat steps 1 to 4 for the next measurement.
6. To go back and forth from the values entered in the DUT results window, choose [< Previous] or [Next >].
7. Press [OK] to exit the window.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Note: *When entering values, the numbers following the unit pull down box will vary. Every time you enter a new value, the first number will exceed the second one. The first number represents the rank of the value you are actually entering. The second number represents the number of values you have already entered.*

5.7 Calibration Summary

Calibration results are viewed in the *Calibration Summary* window, shown in Figure 5-15. This window is opened by choosing Summary or from within the step-by-step procedure.

The *Calibration Summary* window contains two pages, depending on whether you want to view the data for all wavelengths or view the data for a single wavelength.

The calibration factor (CF) is calculated using Equation 5-2.

$$CF = \left(\frac{P_{1500}(W)}{P_{DUT}(W)}\right) \qquad \textit{Eq. 5-2}$$

where P_{1500} = IQ-1500 measured power and P_{DUT} = DUT measured power.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The standard deviation of the calibration factor is calculated using Equation 5-3.

$$\text{Std. Dev.} = \frac{\sqrt{\left(\sum_i \left(CF_i^2\right) - \frac{1}{N}\left(\sum_i (CF_i)\right)^2\right)}}{(N-1)} \qquad \textit{Eq. 5-3}$$

5.7.1 All Wavelengths

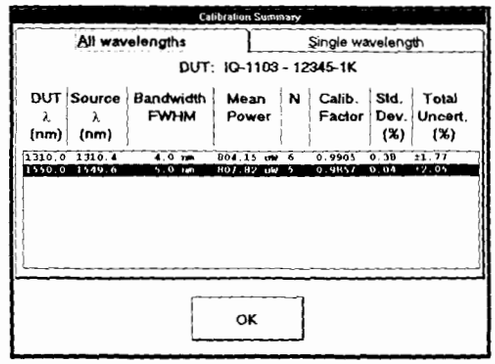


Figure 5-15. All Wavelengths Page

The *Calibration Summary* window for all wavelengths displays the calibration data for each wavelength for the current DUT. The information displayed in the *All Wavelengths* page is explained in the following table.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

FUNCTION	DESCRIPTION
DUT λ (nm)	Wavelength of the power meter under test (DUT).
Source λ (nm)	Source wavelength (may differ slightly from the DUT, for example DUT λ of 1550 nm and source λ of 1549 nm).
Bandwidth FWHM	Full width at half maximum bandwidth of the source used for the measurements.
Mean Power	Average IQ-1500 power measurements.
N	Number of calibration factor measurement sets.
Calib. Factor	Mean calibration factor for the series of N measurements (see Equation 5-2) by which the DUT readings (in watt) must be multiplied.
Std. Dev. (%)	Standard deviation of the calibration factor (see Equation 5-3).
Total Unc. (%)	Total uncertainty of the calibration factor (see Equation 5-1).

Table 5-7. All Wavelengths Page Description

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.7.2 Single Wavelength

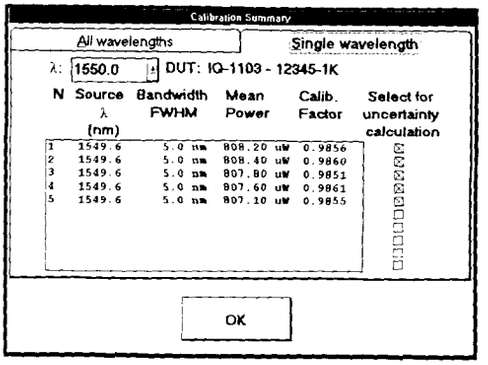


Figure 5-16. Single Wavelength Page

The *Calibration Summary* window for a single wavelength displays the results for each series of measurements performed on a particular DUT at the same wavelength. The information displayed in the *Single Wavelength* page is described in the following table.

FUNCTION	DESCRIPTION
N	Sequential number for the series of measurements of the calibration factor.
Source λ (nm)	Source wavelength.
Bandwidth FWHM	Full width at half maximum bandwidth of the source used for the measurements.
Mean Power	Average IQ-1500 power measurements.

Table 5-8. Single Wavelength Page Description (part 1 of 2)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

FUNCTION	DESCRIPTION
Calib. Factor	Calibration factor calculated using Equation 5-2.
Select for uncertainty calculation	Selects the data included in the uncertainty calculation.

Table 5-8. Single Wavelength Page Description (part 2 of 2)

5.8 Printing a Report of Calibration

Once the calibration has been completed, you have the option to print a *Report of Calibration*. This report contains the calibration data and results for a single DUT. Two report formats are available: long and short. An example of the long report can be found in the appendix. The short report is similar to the long report but does not contain the measurement uncertainties section.

The *Report of Calibration*, either long or short, can be printed to any PC compatible printer. In order to print results, a printer must be connected to the IQ-203 parallel port and must also be selected as the WINDOWS default printer.

Note: *Please refer to the* IQ-200 Optical Test System Instruction Manual *for assistance in locating the parallel printer port and in selecting a printer.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

To select a DUT and print a report

1. To open the Report window, choose [Report] in the Calibration mode main window or follow the instructions in the step-by-step procedure.

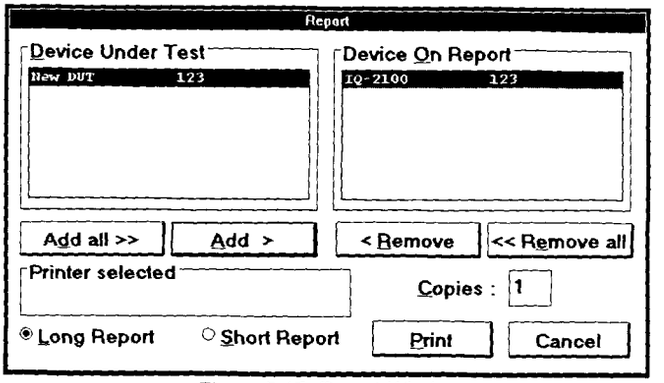


Figure 5-17. Report Window

2. Select the device or devices from which you want the results printed on your *Report of Calibration* in the DUT list box (upper left).
3. Press [Add >] or [Add all >>] to move the selected device(s) in the Device On Report section.
4. Choose between the long and short report.
5. Indicate the number of copies (up to 99) to be printed.
6. Choose [Print].
7. Press [Cancel] to exit or to cancel the operation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6 SUGGESTED APPLICATIONS

6.1 Introduction

Depending on its configuration, your IQ Power Meter module is equipped with one of the following detector types:

Model	Si	Ge	InGaAs	Ge high power
IQ-1100	✓		✓	✓
IQ-1200	✓	✓	✓	✓
IQ-1500	✓	✓		

Table 6-1. Detector Types

The spectral range for each detector type is different. Please see Section 9, *Technical Specifications*, for the recommended usable range of each detector.

In order to make accurate, meaningful, and repeatable power measurements, it is important to consider the following points:

- Connectors, fiber ends, ports, and detectors should be clean at all times.
- A null measurement should be performed prior to each user session or whenever there is a significant change in ambient temperature.
- The optical source should be stable.
- Appropriate test jumpers, connectors, and adapters must be used.
- Calibration setups are very sensitive to movement and vibrations. Moving test jumpers could falsify results; therefore, when modifying a setup, move the power meters and not the test jumpers.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- Once a reference has been taken, ensure that the setup remains stable.
- Since optical losses vary depending on the launch and receive conditions and fiber type, controlling these conditions with mode filters and strippers is essential.

6.2 Performing Absolute Power Measurements

Absolute power measurements are necessary when performing system or component monitoring, quality control, calibration, system or component acceptance, and troubleshooting.

1. Perform an offset nulling.
2. Using an appropriate test jumper and connector/adapter, connect the device under test (DUT) to the detector port.

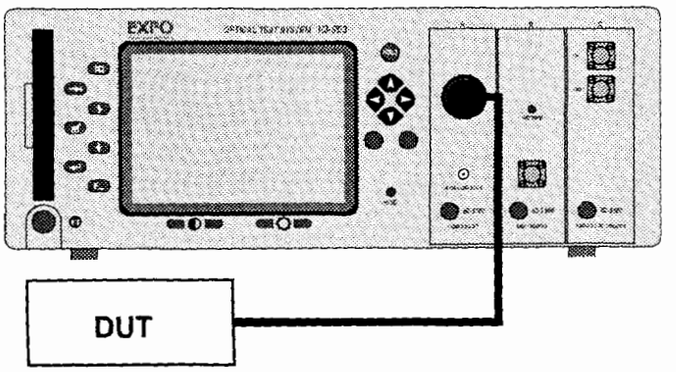


Figure 6-1. Absolute Power Measurement Setup

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3. Configure the power meter to the correct wavelength, 0.00 dB offset, and set the display units to dBm or watts.
4. The absolute optical power can now be monitored and recorded.

Note: *With the IQ-1200 multi-channel power meter, absolute power can be simultaneously measured on four independent channels. Simply apply each step of the above procedure to all used channels.*

➤ ***Tip****: The IQ-1200 virtual channel is an excellent tool for comparing two optical channels. For example, if two devices (connected to channels 1 and 2) are supposed to have identical power levels, displaying a virtual channel (defined as channel 1 minus channel 2) provides easy monitoring of both devices and will quickly highlight any power fluctuations.*

6.3 Measuring Insertion Loss

It is often necessary to accurately measure the insertion loss of a fiber-optic component. Using a light source (IQ-2100) and an IQ Series power meter, this is a simple procedure.

1. Using two appropriate test jumpers and a bulkhead adapter, connect the source to the power meter as shown below. This setup will be used to record a reference value.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

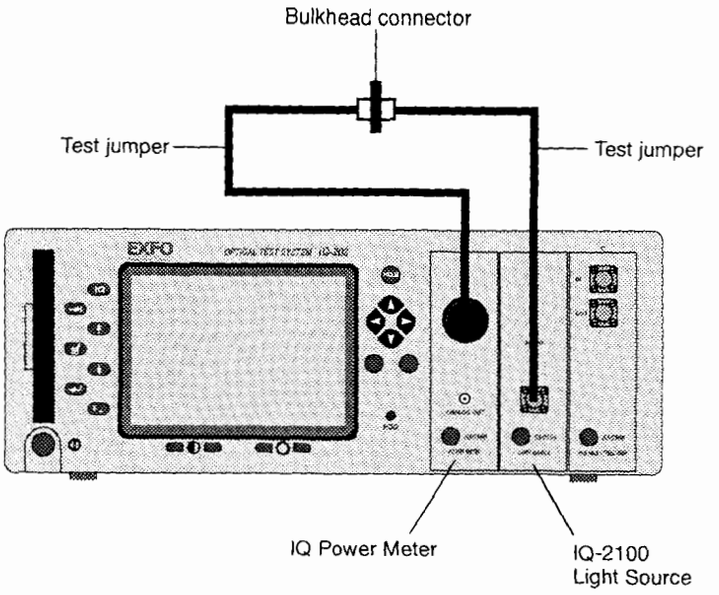


Figure 6-2. Setup for Taking a Reference Measurement

2. Configure the source and power meter to the appropriate wavelength.
3. Activate the source and select a suitable power output.

IMPORTANT

The absolute output power value is not particularly important when measuring insertion loss. It is very important, however, that the power level used for taking the reference measurement be identical to the power level used during the insertion loss measurement.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4. In the IQ Power Meter application (Normal Mode), choose [F3 Rel] then [dB F4]. The reference value has now been taken and the display should indicate 0.000 dB.

5. Replace the bulkhead connector with the device under test, as shown below. For best results, ensure that the setup remains stable.

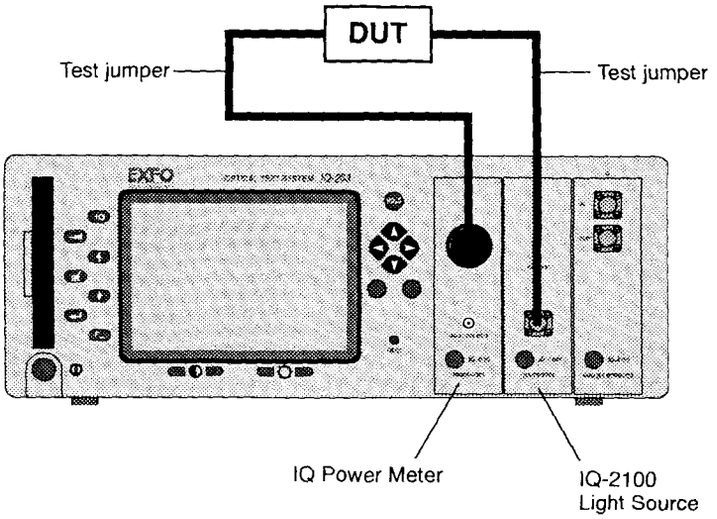


Figure 6-3. Testing Insertion Loss

6. The relative power displayed is the insertion loss of the device under test.

With an IQ-1200 4-channel power meter, the above procedure could be used to perform four simultaneous insertion loss measurements as shown in the figure below.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

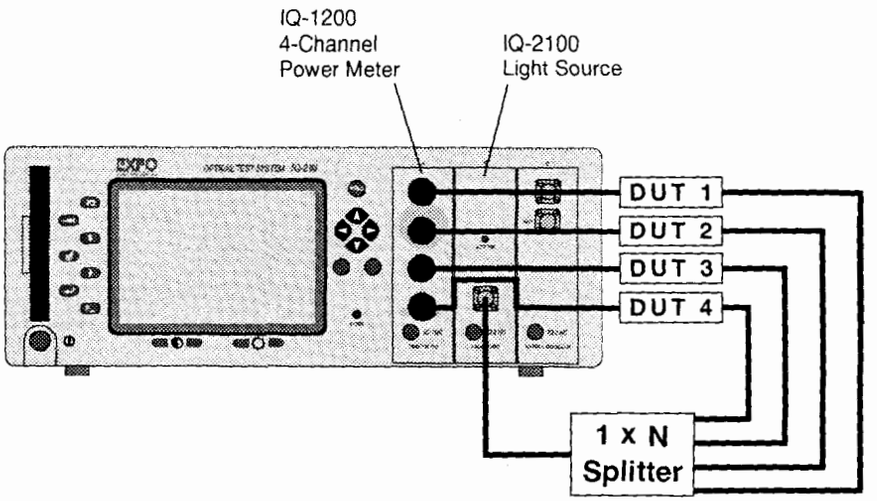


Figure 6-4. Multi-Device Insertion Loss Testing

6.4 Instrument Linearity Testing

As stated in Section 6.3, absolute power levels are not particularly significant when measuring the insertion loss of a fiber-optic component. In calculating insertion loss, we are essentially measuring the difference between the power in and the power out of a DUT. To accurately measure delta power, instrument linearity is very important. The IQ-1100 power meter is specified to be very linear down to -60 dBm. Not only is the IQ-1100 ideally suited for measuring insertion loss, it is suitable as a reference instrument in determining the linearity of other fiber-optic components, such as attenuators and other power meters or optical detectors.

When verifying instrument linearity, a linear variable attenuator (e.g.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

IQ-3100) is also required. Before verifying the linearity of an optical detector, you must confirm the linearity of the attenuator being used.

6.4.1 Confirming the linearity of the attenuator being used

To confirm the linearity of the attenuator being used, you need a stable source (IQ-2100), a variable attenuator (IQ-3100), an IQ-1100, two test jumpers, and appropriate connector/adapters.

1. Connect the instruments as shown below.

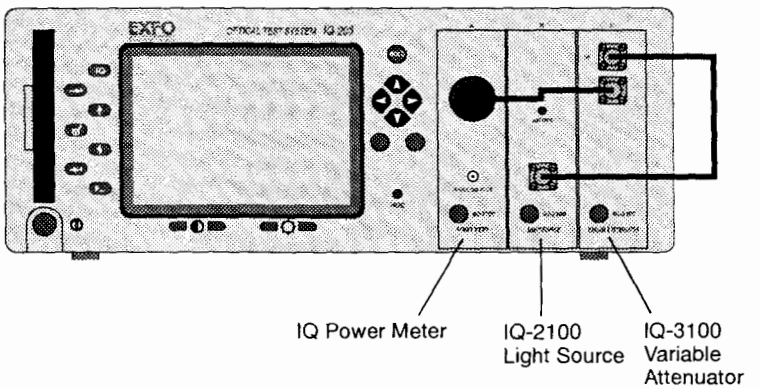


Figure 6-5. Confirming Attenuator Linearity

2. With all instruments set to the same wavelength, and the attenuator set to minimum attenuation, take an IQ-1100 reference measurement and switch to relative display. Also switch the attenuator to relative display mode.

3. At this time, both the attenuator and power meter will be displaying 0.0 dB. Increase the attenuation using constant step sizes, while

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

recording the values from both displays (attenuator and power meter) at each step. Continue until the power meter is indicating around -60 dBm. The recorded values at each step should follow within allowable tolerances. If the values do not follow, there is a problem with the equipment setup or with one of the instruments. Before continuing, the problem must be isolated.

6.4.2 Testing the linearity of an optical detector

With confidence in both the test setup and the instruments being used (see Section 6.4.1), you can now start testing for component linearity.

1. Disconnect the IQ-1100 from the circuit shown in Figure 6-5 and replace it by the detector being tested.
2. Reset the attenuator to minimum attenuation.
3. Increase the attenuation on the attenuator using constant step sizes, while recording the output read by the detector at each step.
4. When completed, the data can be analyzed to determine the linearity of the detector.

6.5 Calibration of Optical Power Meters (IQ-1500)

The calibration of optical power meters is necessary for quality control. The basic requirement for this application is a very accurate reference power meter (IQ-1500) and a very stable source (IQ-2100).

1. Turn on the IQ-1500, the IQ-2100, and the power meter under test and allow some time for them to stabilize (warm-up the sources and the power meters) according to their specifications.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. Use this stabilization time to fill out all the necessary information for the Report of Calibration (optional). Refer to Section 5.4, *Calibration Information*.

3. After the warm-up time is over, zero both power meters (the IQ-1500 and the power meter under test) by nulling the electronic offsets.

4. Connect the output fiber of the stabilized light source (IQ-2100) to the optical port of the IQ-1500, as shown below.

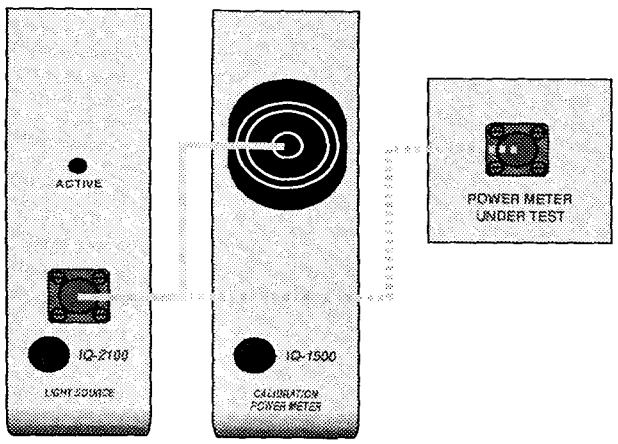


Figure 6-6. Calibration Setup

5. Ensure that all the instruments (including the power meter under test) are correctly configured. Pay special attention to wavelength and measurement units.

6. Take the measurements on the IQ-1500 using the Auto Store function (see Section 5.5, *Auto Store*).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7. Connect the fiber to the power meter under test. Ensure the setup remains as stable as possible.
8. Take measurements on the DUT and enter them using the DUT Results function (see Section 5.6, *DUT Results*). Make sure to proceed as quickly as possible, especially if the light source you use is not very stable.
9. Repeat the process a few times (at least two) to reduce random uncertainties.
10. Review the results in the Calibration Summary (see Section 5.7, *Calibration Summary*).
11. A report, either long or short, can be printed using the Report function (see Section 5.8, *Printing a Report of Calibration*).

To keep the uncertainties as low as possible, the measurements should be performed at the power level of the IQ-1500 reference conditions. This power is 100 µW (-10 dBm) at the NIST. To achieve this level, a variable attenuator such as the IQ-3100 can be introduced between the light source and the power meters.

6.6 Other Applications

The 5 mm detectors of the IQ-1500 can also be used to perform measurements with multicore fibers or with ribbon fibers using special adapters. The IQ-1500 is a good choice for these applications because of its large area detector; the IQ-1500 could also be used for any other application requiring such a detector.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7 MAINTENANCE

There are no user-serviceable components in the IQ Power Meter modules, notwithstanding the procedure described in this section. The modules have been designed to require minimum maintenance and to provide reliable operation for many years to come.

IMPORTANT

When the module is not being used, the protective cap(s) should be fitted over the port(s).

7.1 Cleaning the Fiber Ends

The test jumper fiber ends must be kept clean at all times to ensure minimum loss and reduce reflection.

1. Gently wipe the fiber ends with a lint-free swab dipped in isopropyl alcohol.
2. Dry using clean compressed air.

7.2 Cleaning the Detector Ports

The optical ports should also be cleaned on a regular basis to ensure optimum performance.

1. Remove the protector cap.
2. Gently wipe the window of the detector with a lint-free swab dipped in isopropyl alcohol.
3. Dry using clean compressed air or with a dry lint-free swab.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7.3 Recalibration

To ensure that the power meters remain within the published specifications and to maintain NIST traceability, EXFO recommends than an annual calibration be performed. Please contact EXFO for further information regarding calibration of IQ Power Meters.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

8 TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	RECOMMENDED ACTION
LED push button does not illuminate	Power is not on.	Check AC power cord and power ON the IQ-203 and IQ-206.
		Refer to IQ-200 Optical Test System Instruction Manual to verify fuse.
	Module is not properly inserted.	Power OFF the IQ-203 and IQ-206, remove and reinsert the module.
	Computer locked up.	Reboot the IQ-203.
	LED is burnt.	Call EXFO.
Pushing LED push button does not open the module's main window.	Computer locked up.	Reboot the IQ-203.
IQ Power Meter does not respond to new commands	IQ Optical Test System still processing old commands. «Processing...» is displayed in the status box.	New commands will be executed on completion of current processing.
Dashed line displayed as power value (------)	Power level is below the minimum detectable power.	No action required.

Table 8-1. Problems, Causes, and Recommended Actions (part 1 of 2)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

PROBLEM	PROBABLE CAUSE	RECOMMENDED ACTION
Questionable readings displayed	Dirty detector or optical connectors.	Clean the detector and all optical connections.
	Improper wavelength selected.	Switch to the correct wavelength on all instruments being used.
	Incorrect offset nulling	Perform an offset nulling with protective cap installed.
	Unstable optical source.	Wait for source to stabilize.
Power displayed by the IQ-1500 is not within -9 pw to +9 pw range when cap is on.	Offset nulling should be performed.	Perform offset null measurement.
	Stabilization is not completed.	Wait for the end of the stabilization period.

Table 8-1. Problems, Causes, and Recommended Actions (part 2 of 2)

In all cases, if problem persists after performing recommended action, call EXFO.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

9 TECHNICAL SPECIFICATIONS

9.1 IQ-1100 Single-Channel Power Meter

MODEL	IQ-1101	IQ-1102X	IQ-1103
Detector Type	Si	Ge High Power	InGaAs
Detector Size (mm)	1	2	1
Dynamic Range[1] (dBm)	+10 to -100	+25 to -75	+10 to -100
Spectral Range (nm)	450 to 1100	750 to 1700	800 to 1700
Accuracy (dB)	±0.2 (5%)		
Resolution (dB)	0.001		
Linearity (dB)	±0.015 from 0 to -60 dBm	±0.015 from 10 to -35 dBm	±0.015 from 0 to -60 dBm
Spectral Resolution (nm)	1		

OPERATING ENVIRONMENT	
Operating Temperature	32 to 122 °F (0 to +50°C)
Storage Temperature	-40 to 158°F (-40 to +70°C)
Relative Humidity[2]	0 to 80% non-condensing

MECHANICAL SPECIFICATIONS	
Dimensions	Width: 1.5" (3.8 cm) Height: 4.75" (12.0 cm) Length: 10.3" (26.2 cm)
Weight	1.40 lb (0.63 kg)

1. Measured at 0°C to 30°C temperature range.
2. Measured at 0°C to 40°C temperature range.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

9.2 IQ-1200 Multi-Channel Power Meter

MODEL	IQ-1201	IQ-1202	IQ-1202X	IQ-1203
Detector Type	Si	Ge	Ge High Power	InGaAs
Detector Size (mm)	1	1	2	1
Dynamic Range[1] (dBm)	+10 to -85	+10 to -77	+25 to -65	+10 to -85
Spectral Range (nm)	450 to 1100	750 to 1800	750 to 1700	800 to 1700
Accuracy[2] (dB)	±0.2 (5%)			
Resolution[3] (dB)	0.001			
Linearity[4] (dB)	±0.015 from 0 to -55 dBm	±0.015 from 0 to -47 dBm	±0.015 from 10 to -35 dBm	±0.015 from 0 to -55 dBm
Spectral Resolution (nm)	1			

OPERATING ENVIRONMENT	
Operating Temperature	32 to 122 °F (0 to +50°C)
Storage Temperature	-40 to 158°F (-40 to +70°C)
Relative Humidity[5]	0 to 80% non-condensing

MECHANICAL SPECIFICATIONS	
Dimensions	Width: 1.5" (3.8 cm) Height: 4.75" (12.0 cm) Length: 10.3" (26.2 cm)
Weight	1.40 lb (0.63 kg)

1. From 32°F to 86°F/0°C to 30°C
2. Add 1% for <1000 nm wavelengths at 23 ±1°C (InGaAs, GeX, Ge). Add 1% for <600 nm wavelengths at 23 ±1°C (Si). Add 1% for >1020 nm wavelengths at 23 ±1°C (Si). Add 1% for >1650 nm wavelengths at 23 ±1°C (GeX, Ge). Add 3% for >1650 nm wavelengths at 23 ±1°C (InGaAs).
3. +10 to -55 dBm (InGaAs), +25 to -35 dBm (GeX), +10 to -47 dBm (Ge).
4. 0 to -55 dBm (InGaAs, Si), +10 to -35 dBm (GeX), 0 to -47 dBm (Ge).
5. Measured at 0°C to 40°C temperature range.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

9.3 IQ-1500 Calibration Power Meter

MODEL	IQ-1501(Si)	IQ-1502(Ge)
Spectral Range	450 nm to 1100 nm	750 nm to 1800 nm
Dynamic Range	+5 to -60 dBm	+5 to -60 dBm
Uncertainty at Specific Wavelengths	±1% [1]	±1% [5]
Uncertainty over Full Spectral Range	±1.5% [2]	±1.5% [6]
Display Resolution	0.001 dB / 1 pW	0.001 dB / 1 pW
Linearity	±0.02 dB from -10 dBm to -50 dBm[3]	±0.01 dB from 0 to -50 dBm[7]
Spectral Resolution	0.1 nm	0.1 nm
Applicable Fiber Type	5/125 µm to 100/140 µm N.A. ≤ 0.3	5/125 µm to 100/140 µm N.A. ≤ 0.3
Operation Temperature	23°C ±5°C	23°C ±5°C
Storage Temperature	-40°C to 70°C [4]	-40°C to 70°C [8]
Humidity	≤ 80% (non-condensing)	≤ 80% (non-condensing)

1. ±1% uncertainty at certain fixed wavelengths if calibrated at NIST under NIST reference conditions:
   - absolute power of -10 dBm (100 µW), CW
   - fiber type of 9/125 µm, 50/125 µm, or 62.5/125 µm (B, C, or D)
   - connectors: FC, ST, SC, SMA, or HMS-10
   - FOA used at NIST
   - source spectral width under 10 nm
   - ambient temperature of 23°C ±5°C

   The uncertainty, being nominal, can reach 1.20%. Possible NIST calibrated wavelengths are 672 nm, 786 nm, and 835-855 nm.

   ±2% uncertainty if calibrated at EXFO under the following reference conditions:
   - absolute power of -10 dBm (100 µW), CW
   - 50/125 µm fiber (C) at 845 nm
   - FC connector only, ceramic ferrule

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- FOA used for calibration
- source spectral width under 10 nm
- ambient temperature of 23°C ±5°C

2. ±1.5% uncertainty if calibrated at NIST under the following reference conditions:
   - absolute power between -10 dBm to -50 dBm (100 µW to 10 nW), CW
   - fiber type used in 1.
   - connector used in 1.
   - FOA used in 1.
   - source spectral width under 10 nm
   - ambient temperature of 23°C ±5°C

   ±3% uncertainty if calibrated at EXFO under the following reference conditions:
   - absolute power of -10 dBm to -50 dBm (100 µW to 10 nW), CW
   - fiber type of 62.5/125 µm (D)
   - FC connector only, ceramic ferrule
   - source spectral width ≤ 12 nm
   - ambient temperature of 23°C ±5°C

3. At constant temperature of ±1°C; ±0.01 dB from -15 dBm to -50 dBm.

4. Storing the unit at high temperatures may cause accelerated aging.

5. ±1% uncertainty at certain fixed wavelengths if calibrated at NIST, under the following NIST reference conditions:
   - absolute power of -10 dBm (100 µW), CW
   - 9/125 µm to 62.5/125 µm fiber: B to D
   - connectors: FC, ST, SC, SMA, or HMS-10
   - FOA used at NIST
   - source spectral width under 10 nm
   - ambient temperature of 23°C ±5°C

   The uncertainty, being nominal, can reach ±1.10% at 850 nm and 1310 nm, and 1.30% around 1550 nm. Possible NIST calibrated wavelengths are 786 nm, 835-855 nm, 1280-1320 nm, and 1520-1570 nm.

   ±2% uncertainty if calibrated at EXFO under the following reference conditions:
   - absolute power from 0 dBm to -10 dBm (1 nW to 100 µW), CW
   - 9/125 µm fiber (B) at 1310 nm and 1550 nm, and 50/125 µm fiber (C) at 845 nm
   - FC connector only, ceramic ferrule
   - FOA used for calibration

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- source spectral width under 10 nm
- ambient temperature of 23°C ±5°C

6. ±2% uncertainty if calibrated at NIST under the following reference conditions:
   - power between 0 to -50 dBm (1 mW to 10 nW), CW
   - fiber type used in 5.
   - connector used in 5.
   - FOA used in 5.
   - source spectral width under 10 nm
   - ambient temperature of 23°C ±5°C

   ±4% uncertainty if calibrated at EXFO under the following reference conditions:
   - absolute power of 0 dBm to -50 dBm (1mW to 10 nW), CW
   - fiber type of 62.5/125 µm (D)
   - FC connector only, ceramic ferrule
   - source spectral width ≤ 12 nm
   - ambient temperature of 23°C ±5°C

7. At constant temperature of ±1°C.

8. Storing the unit at high temperatures may cause accelerated aging.

Specifications are subject to change without notice.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

10 CUSTOMER COMMENTS

At EXFO, we are continuously looking for ways to improve our products. We would appreciate any comments or suggestions that you may have concerning the operation and service of the IQ Product Line. Please contact our Sales and Product Support Group at 1-800-663-EXFO (fax: 1-418-683-2170). When calling, please provide the following information:

1. Part Number: IQ _____ Serial Number: _____
2. Product/Software Version: _____

   (see **About** IQ-203 window) _____
3. User Name: _____

   Company Name: _____

   Address: _____

   _____

   _____

   Telephone: _____ Fax: _____
4. Brief description of the product application. _____

   _____

   _____

   _____
5. Comments or description of problems (if any). _____

   _____

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

11 WARRANTY

11.1 General Information

EXFO E.O. Engineering (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.***

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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.

11.2 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.

11.3 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.

11.4 Certification

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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

11.5 Service and Repairs

To obtain service or repair for any equipment, follow the procedure below.

- Call EXFO Sales and Product Support Group at one of the numbers given in Section 1.7. Support personnel will determine if the equipment requires service, repair, or calibration.
- 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.
- 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).

- 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. However, shipping insurance is at the customer's expense.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

APPENDIX A - IQ-1500 REPORT OF CALIBRATION

IQ-1500 owner
123 street name, City State
Country

Report of Calibration

for

Optical power meter
Model No.: IQ-1103
S/N: 12345-1K

Submitted to

DUT owner
123 street name, City State
Country

Report No.: 1

May 23, 1996

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

InGaAs
Model No.: IQ-1103
S/N: 12345-1K

Calibration summary

The test power meter and its detector (DUT), were calibrated at the wavelengths (λ) listed in Table 1 below by comparing them, a number of times (N), to the IQ-1502 calibration power meter (S/N: 27076-1H__) previously calibrated at NIST. The wavelengths were obtained from the sources identified in Table 2. The reference fiber jumper(s) is (are) identified in Table 3.

DUT λ (nm)	Source λ (nm)	Bandwidth FWHM	Mean Power	N	Calibration Factor	Std Dev. (%)	Total Uncert. (%)
1310.0	1310.4	4.0 nm	804.15 uW	6	0.9905	0.38	±1.77
1550.0	1549.6	5.0 nm	807.82 uW	5	0.9857	0.04	±2.05

Table 1. Summary of Calibration Results

Note: The DUT readings must be multiplied by the Calibration Factor.

#	DUT λ (nm)	Source λ (nm)	Source I/D	Source S/N
1	1310.0	1310.4	IQ-2102-BLD	12347-1K
2	1550.0	1549.6	IQ-2103-BLD	12346-1K

Table 2. Sources Used During Calibration

Reference conditions

Before the measurements were performed, the instrumentation was allowed to reach equilibrium with the surrounding test environment and the zero setting was performed as specified by the manufacturer. The reference conditions during the measurements are listed in Table 3 below.

Page 2
Report No.: 1
Date: May 23, 1996

IQ-1500 owner

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

InGaAs
Model No.: IQ-1103
S/N: 12345-1K

Conditions	Value
Calibration Date	May 23, 1996
Temperature	23.0 ± 1.0 °C
Relative Humidity	50 ± 10 % N.C.
Fiber Type, source #1	9/125 um
Connector, source #1	FC/SPC
Fiber Type, source #2	9/125 um
Connector, source #2	FC/SPC

Table 3. Reference Conditions

Recommended recalibration period

The recommended recalibration due-date is: May 23, 1997.

Measurement Uncertainties
(at reference conditions)

The uncertainty estimates for the calibration measurements are described and combined using the following guidelines.

To establish the uncertainty limits, the error sources are separated into:
1. systematic errors whose magnitudes are determined by subjective judgement;
2. random errors whose magnitudes are statistically determined from a series of measurements;
3. the IQ-1500 calibration uncertainty.

The systematic error components are assumed to be independent and have rectangular or uniform distributions. The random errors are assumed to be independent and normally distributed. The total uncertainty is determined by combining the systematic, random, and IQ-1500 uncertainty errors (the root of the sum of the squares) and multiplying the result by a factor of two (2) to have a confidence level of 95%. The measurement uncertainties at reference conditions are listed in Table 4 to 5.

Page 3 IQ-1500 owner
Report No.: 1
Date: May 23, 1996

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

InGaAs
Model No.: IQ-1103
S/N: 12345-1K

Measurement Uncertainties at DUT λ = 1310.0 nm				
Systematic Uncertainties (%)		**Random Uncertainties (%)**		
				N
Source Power Stability	0.10	DUT Calibration (See Table 1)		
IQ-1500 Spectral Response	0.50			
DUT Spectral Response	0.30	**IQ-1500 Calibration**		
Connector	0.10	Test Meter Calibration	1.10	
Setup Repeatability	1.00			

Table 4. Measurement Uncertainties at Reference Conditions (λ=1310.4 nm)

Measurement Uncertainties at DUT λ = 1550.0 nm				
Systematic Uncertainties (%)		**Random Uncertainties (%)**		
				N
Source Power Stability	0.10	DUT Calibration (See Table 1)		
IQ-1500 Spectral Response	0.90			
DUT Spectral Response	0.50	**IQ-1500 Calibration**		
Connector	0.10	Test Meter Calibration	1.20	
Setup Repeatability	1.00			

Table 5. Measurement Uncertainties at Reference Conditions (λ=1549.6 nm)

Page 4
Report No.: 1
Date: May 23, 1996

IQ-1500 owner

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

INDEX

A

abbreviations viii
about 3-4
About Pmgraph 4-2
absolute power 3-20
acquired data
  consulting 3-33
Acquiring 3-7, 5-5
acquiring data. *see* data acquisition
Acquisition Setup window
  illustration 3-25, 3-26
  opening 3-6, 3-25
  setting sampling rate 3-24
  setting wavelength 3-24
adding a wavelength
  in Calibration mode 5-11
  in Normal mode 3-17
Alarm box 4-5
alarm thresholds
  entering 4-9
  indication 4-5
application software
  exiting
    from main window 2-11
    from monitor window 2-11
  loading 2-7
applications. *see* suggested applications
audible alarm 4-10
Auto Store 5-4
auto store function
  purposes 5-26
Auto Store window
  illustration 5-27
  opening 5-4
available memory 3-4
Avg. 3-24

B

B-A box 4-6
bandwidth 5-19
bandwidth FWHM 5-31, 5-32
basic power meter operation. *see* Normal mode
beeps
  computer 4-10

C

C beside a wavelength 3-17, 3-19
Cal. Organization 5-14
calibrating power meters 6-8
calibration factor 5-29, 5-31, 5-33
calibration information ..... 5-12 to 5-26
  adding a DUT to the DUT list 5-17
  adding a source 5-20
  deleting a DUT from the DUT list 5-17
  deleting a source 5-21
  DUT 5-15
  DUT list 5-17
  general 5-13
  modifying DUT information 5-17
  modifying source information 5-20
  reference conditions 5-18
  uncertainties entry 5-21
Calibration Information window
  description. *see* calibration information
  exiting 5-12
  opening 5-4, 5-12
Calibration mode
  accessing 3-3
  adding a wavelength 5-11
  auto store 5-26
  calibration information. *see* calibration information
  calibration summary 5-29
  Channel Setup window 5-11

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

description....5-1 to 5-34
monitor window....2-9
offset nulling....3-13
optimum configuration....5-12
Report of Calibration....5-33
selecting measurement units....5-11
selecting wavelength....5-11
step-by-step calibration procedure....5-6
summary....5-29
calibration procedure
information....5-7
initiating....5-6
null....5-8
optimum configuration....5-12
report....5-10
save....5-9
setup....5-7
step-by-step....5-6 to 5-11
stopping....5-6
calibration summary
all wavelengths....5-30
single wavelength....5-32
Calibration Summary window
illustration....5-30, 5-32
opening....5-4, 5-29
CE information....xi
certification information....x
channel
combining two....3-10
comparing two....3-10
identification....3-7, 4-8
name
entering....3-11
selection....3-5, 3-9, 3-10
Channel Setup window
in Calibration mode....5-11
illustration....5-11
opening....5-4
selecting measurement units....5-11
selecting wavelength....5-11
in Normal mode
adding wavelengths....3-17
channel name....3-11
channel selection....3-9
closing....3-9
customizable parameters....3-9
deleting wavelengths....3-17
description....3-8 to 3-18
illustration....3-8
monitor window selection....3-13
nulling offsets....3-11
opening....3-6, 3-8
selecting a sampling rate....3-15
selecting display resolution....3-15
selecting measurement units....3-14
setting an offset value....3-16
virtual channel definition....3-10
cleaning
detector ports....7-1
fiber ends....7-1
Clear last....4-10
clearing the graphical display area....4-3
combining two channels....3-10
comments card....10-1
computer beeping....4-10
connecting fiber to detector port....2-6
consulting acquired data....3-33
contents....3-4
Continuous Scroll....4-10
control
local....2-3
remote....2-3
status....3-4
controlling the IQ power meter....2-7
conventions
CAUTION....1-3
IMPORTANT....1-3
WARNING....1-3
coordinates
difference....4-6
difference between two points....4-15
finding out....4-15

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

curve plotting displays
clear last 4-10
continuous scroll 4-10
overlap 4-10
curve plotting modes. *see* curve plotting displays
curve sweep 4-10
customer comments card 10-1

D

data acquisition ..... 3-24 to 3-32
conditional start 3-28
consulting acquired data 3-33
data file separator 3-33
delay method 3-31
delayed start 3-31
instant start 3-27
saving format 3-33
size of the resulting data file 3-26
terminating 3-28, 3-31, 3-32
timer method 3-27
trigger conditions list 3-29
trigger method 3-28
data and status display 3-7, 5-5
data in a curve. *see* Graphical Display mode
data in a table. *see* Graphical Display mode
date of manufacture 2-3
delay acquisition method 3-31
deleting
a source 5-21
wavelengths 3-17
description
front panel 2-4
IQ-1100 2-1
IQ-1200 2-1
IQ-1500 2-1
IQ-200 product line 1-1
detector port 2-4
detector ports cleaning 7-1
detector types 6-1
Display menu 3-3
display resolution
automatic 3-15
selecting 3-15
DUT information
adding a DUT to the DUT list 5-17
DUT page 5-15
DUT results 5-27
DUT Results window
illustration 5-28
opening 5-4, 5-27
DUT spectral response 5-25
dynamic range 2-3

E

electronic offset nulling 3-11
exiting the application software 2-11
extended measurement range 3-24

F

FCC information x
features overview 2-2
fiber ends cleaning 7-1
File menu 3-3
Free run 3-7, 5-5
freeing memory 2-11
front panel description 2-4
function buttons
in Calibration mode 5-3
in Graphical Display mode 4-3
in monitor window 2-10
in Normal mode 3-5

G

general page 5-13
Go 4-3
GPIB link 3-4
graph title 4-18

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

graphical display area
illustration 4-4, 4-5
Graphical Display mode ..... 4-1 to 4-18
channel selection 4-8
description 4-1
markers 4-15
power measurements
in a graphic 4-1
in a table 4-1
refresh rate 4-11
scrolling through the display 4-13
setting parameters 4-6
zoom feature 4-12
Graphical Display Mode window
curve parameters 4-5
description 4-1
function buttons 4-3
graphical display area 4-4
illustration 4-1
menu bar 4-2
opening 3-6, 4-1
grid 4-11

H

hard disk drive storage space 3-4
Help menu 3-4
humidity 5-19
humidity error 5-19

I

identification plate. *see* nameplate
illustration of the module 2-4
independent laboratory testing xi
Information 5-4
inserting the module 2-5
insertion loss measurements 6-3
inspection upon receipt 1-2
installing the module 2-5
IQ load 3-4
IQ Software 1-2
IQ-1100
features 2-2
illustration 2-4
technical specifications 9-1
IQ-1200
features 2-2
illustration 2-4
technical specifications 9-2
IQ-1500
features 2-2
illustration 2-4
spectral response 5-24
technical specifications 9-3
uncertainty 5-26
IQ-200 Optical Test System
description 1-2
local control 2-3
remote control 2-3
IQ-200 product line 1-1

L

laboratory testing xi
laser radiation 1-3
launching real-time sampling 4-3
LED push button 2-4, 2-5
linearity testing 6-6
of an attenuator 6-7
of an optical detector 6-8
loading the application 2-7
local 3-4
local control 2-3
lockout 3-4

M

main window
accessing. *see* loading the application
during data acquisition 3-28
in Calibration mode

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

accessing 5-1
data and status display 5-5
description ..... 5-1 to 5-5
function buttons 5-3
illustration 5-2
menu bar 5-2
parameter definition buttons 5-4
in Normal mode
data and status display 3-7
description ..... 3-1 to 3-7
drop-down menus 3-3
function buttons 3-5
illustration 3-2
menu bar 3-3
parameter definition buttons 3-6
title bar 3-3
maintenance 7-1
manufacturing date 2-3
Marker A box 4-6
Marker B box 4-6
marker control buttons
accessing 4-3, 4-15
markers 4-15
Max blinking 4-10
mean power 5-26, 5-31, 5-32
measurement
averaged 3-23
measurement range
extended 3-24
measurement units
selection 3-14
measuring insertion loss 6-3
memory
freeing 2-11
load 3-4
menu bar 3-3, 4-2
menus
Display 3-3
File 3-3
Help 3-4
Mode 3-3
Min blinking 4-10
Mode menu 3-3
modifying source information 5-20
module
illustration 2-4
insertion 2-5
installation 2-5
removal 2-6
monitor window
closing 2-10
description 2-9
illustration 2-9
many channels at a time 3-13
opening 2-9
selection 3-13
moving through the display 4-13

N

nameplate 2-3
NIST traceability 7-2
Normal mode
description ..... 3-1 to 3-34
main window 3-1
main window. *see also* main window
usage 3-1
normal mode
monitor window 2-9
nulling the offsets 3-11

O

offset nulling
correctly performed 3-12
for all channels 3-13
in Calibration mode 3-13
in Normal mode 3-11
offset nulling constants 3-12, 3-13
offset power 3-23
offset value 3-7, 3-23
description 3-16

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

setting 3-16
offsetting the power 3-23
open as template 3-3
open config. 3-3
optical connections 2-6
Options window ..... 4-6 to 4-11
alarm 4-9
channel 4-8
description 4-6
display 4-10
exiting 4-7
grid 4-11
illustration 4-7
measurement units 4-9
mode 4-7
opening 4-3, 4-6
scale 4-11
units 4-9
Overlap 4-10

P

parameter definition buttons 3-6, 5-4
part number 2-3
pausing real-time sampling 4-3
performance variation xi
port
detector 2-4
power measurements ..... 3-19 to 3-24
absolute power 3-20
averaged 3-23
in a curve. *see* Graphical Display mode
offset power 3-23
performing 6-2
recommendations 6-1
relative power 3-21
repeatability 6-1
tabular format. *see* Graphical Display mode
power measurements. *see also* Calibration mode
power meter calibration 6-8
power offset 3-23
preliminary information ..... 2-1 to 2-11
printing
a Report of Calibration 5-33
graphics 4-3, 4-18
Processing 3-7, 5-5
product version 2-3
protective cap 7-1
push button 2-4

R

random uncertainties 5-23, 5-25
real-time sampling
clearing the display 4-3
pausing 4-3
printing 4-3
resuming 4-3
start 4-3
stopping 4-3
real-time sampling display 4-1
recalibration 7-2
recommendations for repeatability 6-1
Ref 3-7
reference conditions 5-18
reference conditions page 5-18
reference measurement 3-7
reference value 3-21
storing 3-21
referenced power 3-21
refresh rate 4-11
definition 4-12
relative power 3-21
remote 3-4
remote control 2-3
removing a module 2-6
repeatability
of measures 6-1
of the setup 5-25

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Report 5-4
Report of Calibration
example ..... A-1 to A-5
long 5-33
printing 5-33
short 5-33
Report window
opening 5-4
resuming real-time sampling 4-3
Return Merchandise Authorization 11-3
RMA 11-3

S

safety conventions 1-3
safety recommendations 1-3
sampling point
definition 4-17
number 4-17
sampling rate 3-7
on a curve 4-12
selecting 3-15
setting 3-24
save config. 3-3
scale 4-11
scrolling through the display 4-13
selecting
a channel 3-9
display resolution 3-15
measurement units
in Calibration mode 5-11
in Normal mode 3-14
sampling rate 3-15
wavelength
in Calibration mode 5-11
in Normal mode 3-7, 3-18
separator 3-33
serial number 2-3
setting
the offset value 3-16
wavelength
in Calibration mode 5-11
in Normal mode 3-7, 3-18
setup repeatability 5-25
software version 3-4, 4-2
source list 5-20
source power stability 5-24
spectral
range 2-3, 6-1
resolution 5-25
response
of a DUT 5-25
of the IQ-1500 5-24
stability of the source 5-24
stabilization circuitry 2-10
Stabilizing 3-7, 5-5
stabilizing the IQ-1500 2-10
standard deviation 5-26, 5-30, 5-31
standard items 1-2
starting real-time sampling 4-3
status 3-7
step-by-step procedure. *see* calibration procedure
Stop 4-3
stopping real-time sampling 4-3
storage 1-4
storage space 3-4
suggested applications
absolute power measurements 6-2
calibration of power meters 6-8
linearity testing 6-6
measuring insertion loss 6-3
others 6-10
Summary 5-4
summary
calibration 5-29
sweep of the display 4-10, 4-11
symbols viii
systematic uncertainties 5-22, 5-24

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

T

technical specifications
IQ-1100 9-1
IQ-1200 9-2
IQ-1500 9-3
temperature
error 5-19
stabilization 2-10
warning 2-10
testing linearity 6-6
time scale 4-11
timer acquisition method 3-27
title bar 3-3
total uncertainties 5-23
total uncertainty 5-31
traceability 7-2
transportation 1-4
trigger acquisition method 3-28
trigger conditions list 3-29
troubleshooting 8-1

U

Ultra Tech Engineering Labs Inc. xi
uncertainties
entry 5-21
page 5-22
random 5-23, 5-25
systematic 5-22, 5-23, 5-24
total 5-23
uncertainty calculation 5-33
unloading memory 2-11
unpacking 1-2
user-serviceable components 7-1

V

version 2-3
virtual channel 3-10
virtual channel definition 3-10
visual alarm 4-10

W

Waiting for trigger or start time 3-7, 5-5
warm-up period 2-11
warranty
certification 11-2
exclusions 11-2
general information 11-1
liability 11-2
period 11-1
repairs 11-3
service 11-3
wavelength
adding 3-17
deleting 3-17
identification 3-7
marked with a C 3-17, 3-19
setting
from Acquisition Setup window 3-24
in Calibration mode 5-11
in Normal mode 3-18
white line 4-9

X

X axis 4-10, 4-11
X axis label 4-18
X coordinates 4-6

Y

Y axis 4-9
Y axis label 4-18
Y coordinates 4-6

Z

zero power reference 3-12
zero reference 3-12
zero the power meter 3-12

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

zoom control 4-12
zoom control buttons..... 4-3
    accessing 4-3, 4-13
zooming on a curve..... 4-12

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

IQ-200 Optical Test System

Instruction Manual

March 1997
P/N: MAN-056-I .4ACE

Fourth Edition

CE

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 Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.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 E. O. Engineering Inc. (EXFO).

Information furnished 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.

© 1997 EXFO Electro-Optical Engineering Inc.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Note to User

This manual contains information on

- *the IQ-203 Mainframe.....page 2-1*
- *the IQ-206 Expansion Unit.....page 3-1*
- *the IQ-206 PC Expansion Card .....page 4-1*
- *the IQ Software.....page 6-1*
- *the IQ-9600 Utility Module .....page 9-3*

ArtiSan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CAUTION

Use of controls, adjustments, or performance other than specified herein may result in hazardous visible light exposure.

Use of controls, adjustments, or procedures other than those specified in this manual may result in situations hazardous to the user and/or to the equipment.

It is extremely important to properly position the power supply selector, located at the back of the IQ-206 Expansion Unit, according to the electrical supply being used. Operating the unit while the power supply selector is improperly positioned may result in permanent damage to the unit. Refer to Section 1.3.3 for more details.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Contents

Certification Information x
Abbreviations & Symbols xiii

1 INTRODUCTION 1-1

1.1 Presentation 1-1
1.2 IQ-200 Product Line 1-1
1.3 General Safety Information 1-2
1.4 Transportation and Storage 1-6
1.5 Getting Help 1-7

2 IQ-203 MAINFRAME 2-1

2.1 Unpacking and Inspection 2-1
2.2 Description of the IQ-203 Mainframe 2-2
2.3 Optional Modem Card 2-5

3 IQ-206 EXPANSION UNIT 3-1

3.1 Unpacking and Inspection 3-1
3.2 Description of the IQ-206 Expansion Unit 3-1

4 IQ-206 PC EXPANSION CARD 4-1

4.1 Unpacking and Inspection 4-1
4.2 IQ-206 PC Expansion Card Description 4-1
4.3 Requirements 4-2
4.4 Hardware Settings 4-3
4.5 IQ-206 PC Expansion Card Installation 4-5
4.6 IQ Software Installation 4-6
4.7 IQ Software Configuration 4-9

5 IQ-200 OPTICAL TEST SYSTEM INSTALLATION 5-1

5.1 IQ-200 Component Positioning and Cooling 5-1
5.2 Bench Top and Rack Mount Setup 5-1
5.3 Connecting the IQ Components 5-6
5.4 IQ Series Module Insertion 5-10

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.5 IQ Series Module Removal 5-11
5.6 GPIB Compatibility 5-11

6 IQ SOFTWARE 6-1

6.1 Software Conventions 6-1
6.2 Getting Started with the IQ-203 Mainframe 6-10
6.3 Getting Started with the IQ-206 PC Expansion Card 6-12
6.4 IQ-200 Optical Test System Window 6-15
6.5 Module Identification 6-22
6.6 IQ Application at Startup 6-23
6.7 IQ Maestro Applications 6-26
6.8 Printer Selection 6-31
6.9 Module Main Windows 6-33
6.10 IQ-200 Module Monitor Windows 6-35
6.11 Exiting the IQ Software 6-37
6.12 Powering Off the IQ-203 Mainframe 6-37
6.13 Powering Off the IQ-206 Expansion Unit 6-37

7 MAINTENANCE 7-1

7.1 Maintenance of the IQ-203 Mainframe 7-1
7.2 Maintenance of the IQ-206 Expansion Unit 7-4
7.3 Maintenance of the IQ-206 PC Expansion Card 7-6

8 TROUBLESHOOTING 8-1

8.1 IQ-203 Mainframe 8-1
8.2 IQ-206 Expansion Unit 8-2
8.3 IQ-206 PC Expansion Card 8-3

9 IQ SERIES MODULES AND APPLICATIONS 9-1

9.1 IQ Series Modules 9-1
9.2 Application Matrix 9-2
9.3 IQ-9600 Utility Module 9-3

10 TECHNICAL SPECIFICATIONS 10-1

10.1 IQ-203 Mainframe 10-1
10.2 IQ-206 Expansion Unit 10-2
10.3 IQ-206 PC Expansion Card 10-3

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

11 WARRANTY 11-1

11.1 General Information 11-1
11.2 Liability 11-2
11.3 Exclusions 11-2
11.4 Certification 11-2
11.5 Software License Agreement 11-2
11.6 Warranty and Special Provisions 11-4
11.7 Service and Repairs 11-6

12 CUSTOMER COMMENTS 12-1

INDEX INDEX-1

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figures

Figure 1-1. Power Cable Plug Identification 1-5
Figure 2-1. IQ-203 Mainframe Front Panel 2-3
Figure 2-2. IQ-203 Mainframe Back Panel 2-4
Figure 2-3. IQ-203 Mainframe Nameplate 2-5
Figure 3-1. IQ-206 Expansion Unit Front Panel 3-2
Figure 3-2. IQ-206 Expansion Unit Back Panel 3-3
Figure 3-3. IQ-206 Expansion Unit Nameplate 3-4
Figure 4-1. Side View of the IQ-206 PC Expansion Card 4-2
Figure 4-2. DIP Switches Set to Default Configuration (IRQ 15 and 300h) 4-3
Figure 4-3. IQ Software Configuration Selection 4-7
Figure 4-4. IQ Software Configuration Confirmation 4-8
Figure 4-5. IQ Software Icon 4-9
Figure 4-6. IQ Software Configuration Icon 4-10
Figure 4-7. IQ-206 Configuration Utility Window 4-10
Figure 4-8. Confirming the New Configuration 4-11
Figure 5-1. IQ-200 Optical Test System Bench Top Setup 5-2
Figure 5-2. Optional Rack Mount Kit Assembly 5-3
Figure 5-3. Rack Mount Kit — Bottom View 5-4
Figure 5-4. Rack Mount Cabinet 5-5
Figure 5-5. IQ-203 Mainframe Connected to 4 Expansion Units 5-7
Figure 5-6. IQ-206 PC Expansion Card Connected to 4 Expansion Units 5-9
Figure 5-7. Bottom of the Front Face 5-10
Figure 6-1. IQ-203 Front Panel Mouse 6-2
Figure 6-2. Software Buttons 6-3
Figure 6-3. Edit Box 6-3
Figure 6-4. List Box 6-4
Figure 6-5. Radio Buttons 6-4
Figure 6-6. Check Box 6-4
Figure 6-7. Relation between Front Panel Keys and Software Buttons 6-6
Figure 6-8. Keypad Window 6-8
Figure 6-9. Software Keyboard 6-9
Figure 6-10. IQ Software Icon 6-14
Figure 6-11. IQ-200 Optical Test System Window 6-15
Figure 6-12. IQ Setting Icon 6-18
Figure 6-13. IQ Setting Window 6-19
Figure 6-14. Closed Module Application Icon 6-21

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figure 6-15. Open Module Application Icon 6-21
Figure 6-16. Module Identification Window 6-22
Figure 6-17. Startup Command Line 6-23
Figure 6-18. Launcher Icon 6-26
Figure 6-19. Maestro Application Launcher Window 6-27
Figure 6-20. Selecting Modules 6-29
Figure 6-21. Test Steps Window 6-31
Figure 6-22. Printer Setup Window 6-32
Figure 6-23. List of Available Printers 6-32
Figure 6-24. Driver Installation 6-33
Figure 6-25. Main Window Example (IQ-9100 Optical Switch) 6-34
Figure 6-26. Monitor Window Example (IQ-9100 Optical Switch) 6-35
Figure 6-27. Monitor Window with Function Buttons 6-36
Figure 7-1. Pulling out the Fuse Holder 7-2
Figure 7-2. Replacing the Fuses 7-3
Figure 7-3. Pulling out the Fuse Holder 7-4
Figure 7-4. Replacing the Fuses 7-5
Figure 9-1. Exploded View of the IQ-9601 Utility Module 9-4
Figure 9-2. Exploded View of the IQ-9602 Utility Module 9-5

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Certification Information

F.C.C. INFORMATION TO USER

IQ-203 Mainframe and IQ-206 PC Expansion Card

This equipment 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 equipment is operated in a commercial environment. This equipment 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 equipment 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 equipment.***
- ***This equipment is equipped with a shielded 3-wire power cord and plug. Use this power cord in conjunction with a properly grounded electrical outlet to avoid electrical shock and to reduce radio frequency interference that may emanate from the power cord.***
- ***Shielded remote I/O cables, with properly grounded shields and metal connectors, are recommended to be used in order to reduce radio frequency interference that may emanate from these cables.***
- ***This equipment is equipped with a Microsoft™ mouse model 50674.***
- ***When the GPIB option is present, this equipment is equipped with a shielded GPIB cable.***

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- ***This equipment may be equipped with an optional keyboard # 1 or #2 model #ORD008A or #G84-4100PPU.***
- ***This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.***

IQ-206 Expansion Unit

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate frequency energy and, if not installed and used in accordance with instruction manual, may cause harmful interference to radio communications. However, there are no guarantees that interference to radio interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

- ***Changes or modifications not expressly approved by EXFO Electro-Optical Engineering could void the user's authority to operate the equipment.***
- ***This equipment is equipped with a shielded 3-wire power cord and plug. Use this power cord in conjunction with a properly grounded electrical outlet to***

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

avoid electrical shock and to reduce radio frequency interference that may emanate from the power cord.

- ***Shielded remote I/O cables, with properly grounded shields and metal connectors, are recommended to be used in order to reduce radio frequency interference that may emanate from these cables.***

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 UltraTech, a renowned test laboratory from Toronto, Canada. This guarantees the unerring objectivity and authoritative compliance of all test results.

CE INFORMATION TO USER

The IQ-200 Optical Test System has been tested and found to comply with the following limits for a digital device:

- IQ-203 Mainframe Class A
- IQ-206 Expansion Unit Class B
- IQ-206 PC Expansion Card Class A

Please see the respective Declarations of Conformity.

Note: *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 FCC statement, the said equipment complies with the relevant Federal Communications Commission standards.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Abbreviations & Symbols

Technical Terms	
λ	wavelength, in nanometers (nm) for fiber-optic applications
AC	alternating current
CPU	central processing unit
CRT	cathode ray tube
CW	continuous wave
DC	direct current
FOA	fiber-optic adapter
GPIB	general purpose interface bus
LCD	liquid crystal display
LED	light emitting diode
LSR	laser (light amplification by stimulated emission of radiation)
MB	megabyte
MHz	megahertz
RAM	random access memory
SCPI	standard commands for programmable instruments
TEC	thermo-electrically cooled (LSR)
VA	volt-ampere
VAC	volt (alternating current)
VGA	video graphics array

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Orders of Magnitude		
G	giga	(10^9)
M	mega	(10^6)
k	kilo	(10^3)
m	milli	(10^{-3})
µ	micro	(10^{-6})
n	nano	(10^{-9})
p	pico	(10^{-12})

Measurement Units	
Bd	baud
dB	decibel
dBm	dB ref. to 1mW
Hz	hertz
m	meter
W	watt

Materials	
Ge	germanium
InGaAs	indium gallium arsenide
NiCd	nickel cadmium
PCS	plastic-clad silica
PVC	polyvinyl chloride
Si	silicon

Institutions and Corporations	
IBM	International Business Machines
NIST	National Institute of Standards and Technology

Miscellaneous	
CFR	Code of Federal Regulations
PC	personal computer (trademark of IBM)
RMA	return merchandise authorization

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1 INTRODUCTION

1.1 Presentation

EXFO E.O. Engineering Inc. (EXFO) is pleased to introduce the IQ-200 Optical Test System product line. EXFO's commitment to superior design in all fiber-optic instrumentation is respected throughout the industry and is based on four goals:

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

The IQ-200 Optical Test System will provide many years of reliable operation. In order to fully benefit from the many features offered by the IQ-200 laboratory product family, it is important to read the contents of this instruction manual thoroughly.

1.2 IQ-200 Product Line

The IQ-200 scientific product line is a modular optical test system designed for laboratory application. Thanks to the Windows™ compatible IQ Software, the IQ-200 Optical Test System combines power, performance, flexibility with 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 through an IQ-206 PC Expansion Card installed in any PC. The available IQ Series modules are listed in Section 9.1 of this manual.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.3 General Safety Information

Before powering on, we strongly suggest that you read and comply with the recommendations given in this section. These instructions and indications must be followed to ensure safe operation of the unit.

1.3.1 Safety Conventions

WARNING, CAUTION, and IMPORTANT

The following conventions should be clearly 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 fully understood and met.

CAUTION Refers to a potential product hazard. It requires a procedure which, if not correctly followed, may result in irreparable component damage. Do not proceed beyond a CAUTION unless the required conditions are fully understood and met.

IMPORTANT Refers to any information regarding the operation of the product which should not be overlooked.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.3.2 Safety Precautions

The following safety precautions must be observed during the operation and servicing of the units. Failure to comply with these precautions or with specific indications elsewhere in this manual violates safety standards of intended use of the unit. EXFO assumes no liability for the user's failure to comply with these requirements.

- Unit covers cannot be removed during operation.
- Before powering ON the unit, all grounding terminals, extension cords, and devices connected to it should be connected to a protective ground via a ground socket. Any interruption of the protective grounding will cause a potential shock hazard and possible personal injury.
- Whenever the ground protection is impaired, the unit must not be used and be secured against any accidental or unintended operation.
- Only fuses with the required rated current and specified type (normal blow, time delay, etc.) may be used for replacement. Do not use repaired fuses or short-circuit fuse holders.
- Any adjustments, maintenance, and repair of opened units under voltage should be avoided and carried out only by skilled personnel aware of the hazard involved. Do not attempt internal service or adjustment unless another person qualified in first aid is present. Do not replace any components while power cable is connected.
- Operation of any electrical instrument around flammable gases or fumes constitutes a major safety hazard.
- Installation of substitute parts or modification of the unit should be carried out by authorized personnel only.
- Capacitors inside the unit may be charged even if the unit has been disconnected from its electrical supply.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.3.3 AC Requirements

IQ-203 The IQ-203 can operate from any single-phase AC power source between 100 V and 240 V (50 to 60 Hz). The maximum input current of the IQ-203 is 1.5 A.



This symbol, found at the back of the IQ-203 Mainframe, indicates that the user should refer to the instruction manual for fuse replacement. The fuse replacement procedure is given in Section 7.1.3.

IQ-206 Before plugging in the IQ-206, it is extremely important to properly position the IQ-206 power supply selector, found on the back panel of the unit. The power supply selector has two positions:

- the single-phase AC power source used is between 100 V and 120 V (50/60 Hz)
- the single-phase AC power source used is between 200 V and 240 V (50/60 Hz).

The maximum input current of the IQ-206 is 3.0 A at 120 V and 2.0 A at 240 V with all options installed.



This symbol, found at the back of the IQ-206 Expansion Unit, indicates that the user should refer to the instruction manual for power supply selector positioning and fuse replacement. Instructions on power supply selector positioning are given above while the fuse replacement procedure is given in Section 7.2.1.

CAUTION

Improper positioning of the IQ-206 power supply selector may result in permanent damage to the unit.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.3.4 Power Cable

This unit uses an international safety standard three-wire power cable. This cable serves as a ground when connected to an appropriate AC power receptacle. The type of power cable supplied with each unit is determined according to the country of destination. The figure below illustrates the different power cables available.

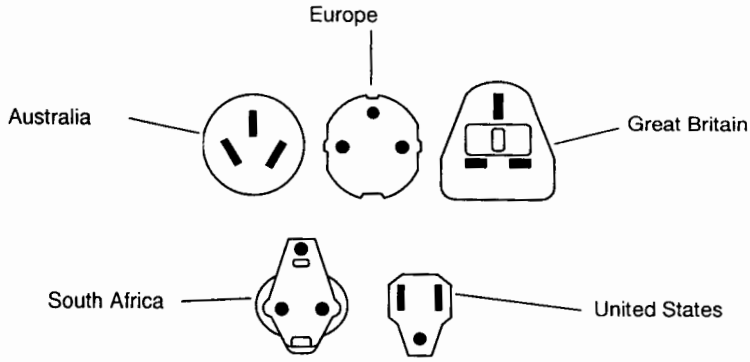


Figure 1-1. Power Cable Plug Identification

Only qualified electricians should connect a new plug if needed. The color coding used in the electric cable depends on the cable. New plugs should meet the local safety requirements and include the following features:

- adequate load-carrying capacity
- ground connection
- cable clamp

WARNING

To avoid electrical shock, do not operate the unit if there are signs of damage to any part of the outer surface (covers, panels, etc.).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

To avoid serious injury, the following precautions must be observed before powering ON the unit.

- ***If the unit is to be powered via an auto transformer for voltage reduction, the common terminal must be connected to the grounded power source pole.***
- ***Insert the power cable plug into a power outlet with a protective ground contact. Do not use an extension cord without a protective conductor.***
- ***Before powering ON the unit, the protective ground terminal of the unit must be connected to a protective conductor using the unit power cord.***
- ***Do not tamper with the protective ground terminal.***

1.4 Transportation and Storage

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

- If the units are to be shipped, pack them in their original packing material for best protection.
- When not in use, store units at room temperature in a clean and dry area. Avoid high humidity or large temperature fluctuations.
- Keep the units out of direct sunlight.
- Avoid shocks and vibrations.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1.5 Getting Help

If any difficulty is encountered while operating the IQ-200 Optical Test System, please call EXFO at one of the offices below. The Technical Support Group is available from 7:30 a.m. to 8:00 p.m. eastern time, Monday to Friday. Any sales offices can also be contacted if questions or problems arise.

USA and Canada	Tel.:	1-800-663-EXFO
	Fax:	1-418-683-2170
International	Tel.:	418-683-0211
	Fax:	418-683-2170
EXFO Europe	Tel.:	33-1-34.63.00.20
	Fax:	33-1-34.65.90.93
E-mail	support@exfo.com	

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2 IQ-203 MAINFRAME

2.1 Unpacking and Inspection

The IQ-203 Mainframe has been thoroughly inspected before shipment. If any damage has occurred during transportation or if any item is missing, please notify EXFO immediately.

The IQ-203 Mainframe is delivered with the following standard items:

- IQ-203 Mainframe
- IQ-200 Optical Test System Instruction Manual
- IQ User's Guide binder with dividers
- GPIB and Application Development Guide
- back-up floppy disk
- 2 blank cover plates
- AC power cord
- Declaration of Conformity
- Certificate of Quality

Retain the original packaging material in case you need to return the unit.

The following items are optional (please verify invoice):

- B1: Microsoft mouse
- I1: GPIB device card
- I2: GPIB controller card
- K1: external keyboard
- N1: additional 8 MB RAM memory
- RK: rack mount kit (19 inches)
- RM: remote kit
- X1: modem card

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- external VGA video monitor (not supported in inventory; call EXFO, any standard model can be used)
- printer (not supported in inventory; call EXFO, any standard model can be used)

2.2 Description of the IQ-203 Mainframe

The IQ-203 is the mainframe of the IQ-200 Optical Test System. The IQ-203 controls all the modules, whether they are inserted in the IQ-203 or in an IQ-206 Expansion Unit. The standard IQ-203 integrates a 486DX4 micro-processor (75 MHz) PC architecture with 550 MB hard disk and 8 MB of RAM. In addition to operating the IQ modules, any commercial software (spreadsheets, word processors, etc.) can also be installed on the IQ-203.

A Windows™ compatible IQ Software controls all modules simultaneously via the IQ-203 bus. At delivery, this software is already installed on the IQ-203 Mainframe and ready to run. For more information on the IQ Software, refer to Section 6.

All software commands can be controlled with the hardware keys and mouse provided on the front panel of the unit. However, an optional external mouse and keyboard allow for ease of operation. Also, the addition of a VGA monitor can enhance the visual aspect of the application just as a printer can be useful for producing hard copies. Since the IQ-203 is PC based, it can also be equipped with a network interface card (ethernet or other), in order to be connected to a Local Area Network (LAN).

The IQ-203 has room for three user-interchangeable modules and can control up to four IQ-206 Expansion Units: the total system capacity is 27 single-slot modules. For more information on a typical IQ-200 setup, refer to Section 5.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.2.1 Front Panel

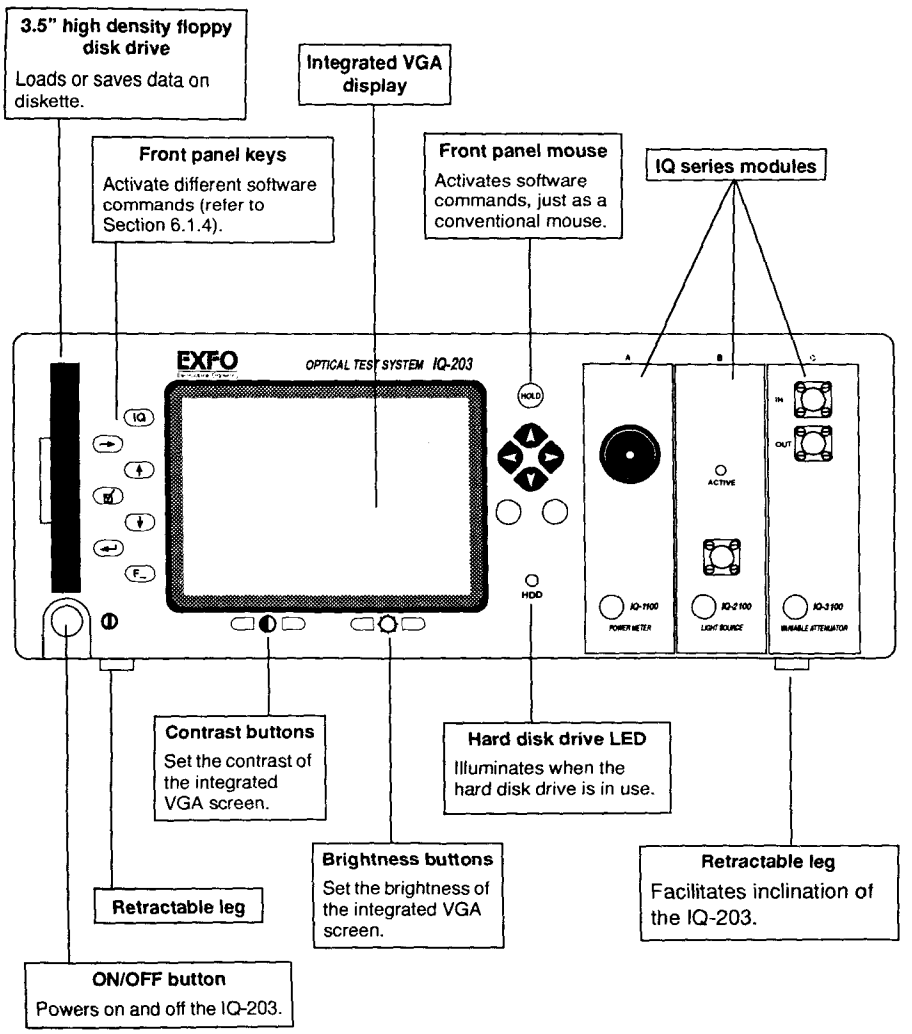


Figure 2-1. IQ-203 Mainframe Front Panel

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.2.2 Back Panel

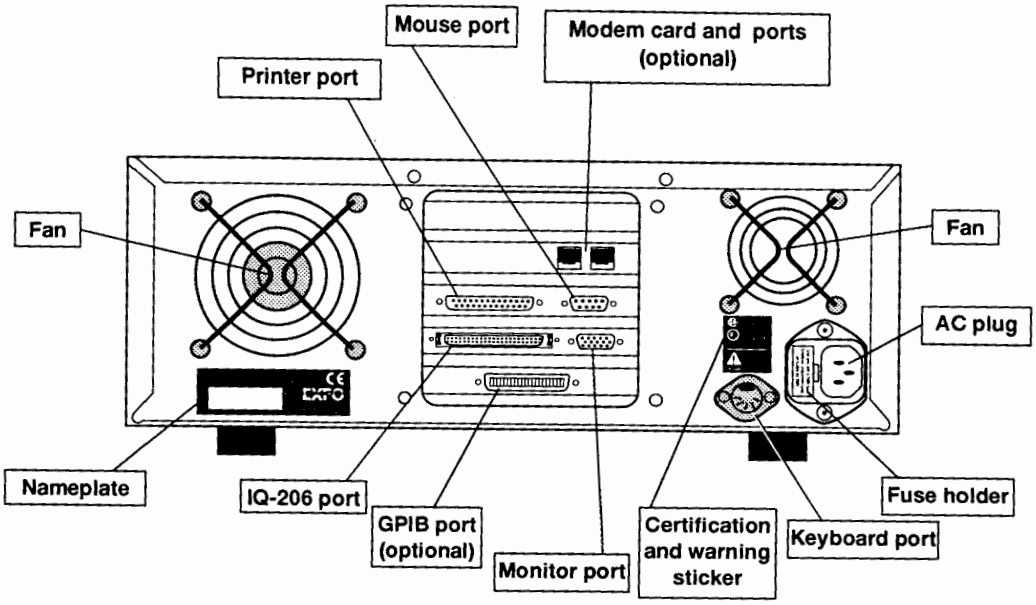


Figure 2-2. IQ-203 Mainframe Back Panel

***Note**: The actual ports on your unit may differ from those depicted in the illustration.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2.2.3 Nameplate

The IQ-203 Mainframe nameplate is located on the back panel of the unit.

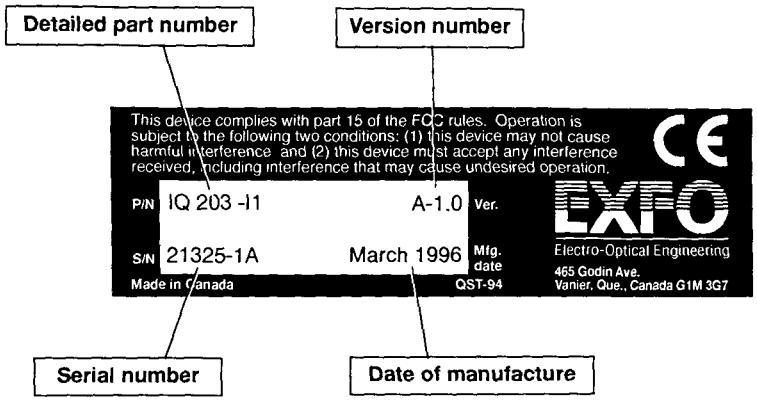


Figure 2-3. IQ-203 Mainframe Nameplate

2.3 Optional Modem Card

A modem card is available as an option with the IQ-203 Mainframe and must be installed at the factory. The modem card I/O base address and interrupt location are preset at the factory, so other components of the system have to be configured according to them.

I/O base address	2E8h (COM4)
Interrupt	IRQ7

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3 IQ-206 EXPANSION UNIT

3.1 Unpacking and Inspection

The IQ-206 Expansion Unit has been thoroughly inspected before shipment. If any damage has occurred during transportation or if any item is missing, please notify EXFO immediately.

The IQ-206 is delivered with the following standard items:

- IQ-206 Expansion Unit
- IQ interface cable
- five blank cover plates
- Certificate of Quality
- Declaration of Conformity
- AC power cord

Retain the original packaging material in case you need to return the unit.

3.2 Description of the IQ-206 Expansion Unit

The IQ-206 is called the expansion unit of the IQ-200 Optical Test System because it is usually used to expand the module capacity of an IQ-200 Optical Test System. Up to four IQ-206 Expansion Units can be linked to an IQ-200 Optical Test System. Each IQ-206 Expansion Unit can support six modules, which are either controlled from an IQ-203 Mainframe or from an IQ-206 PC Expansion Card, via the Windows™ compatible IQ Software.

Instructions on how to connect the IQ-206 Expansion Unit to a system are given in Section 5 while instructions on the IQ Software are given in Section 6.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.2.1 Front Panel

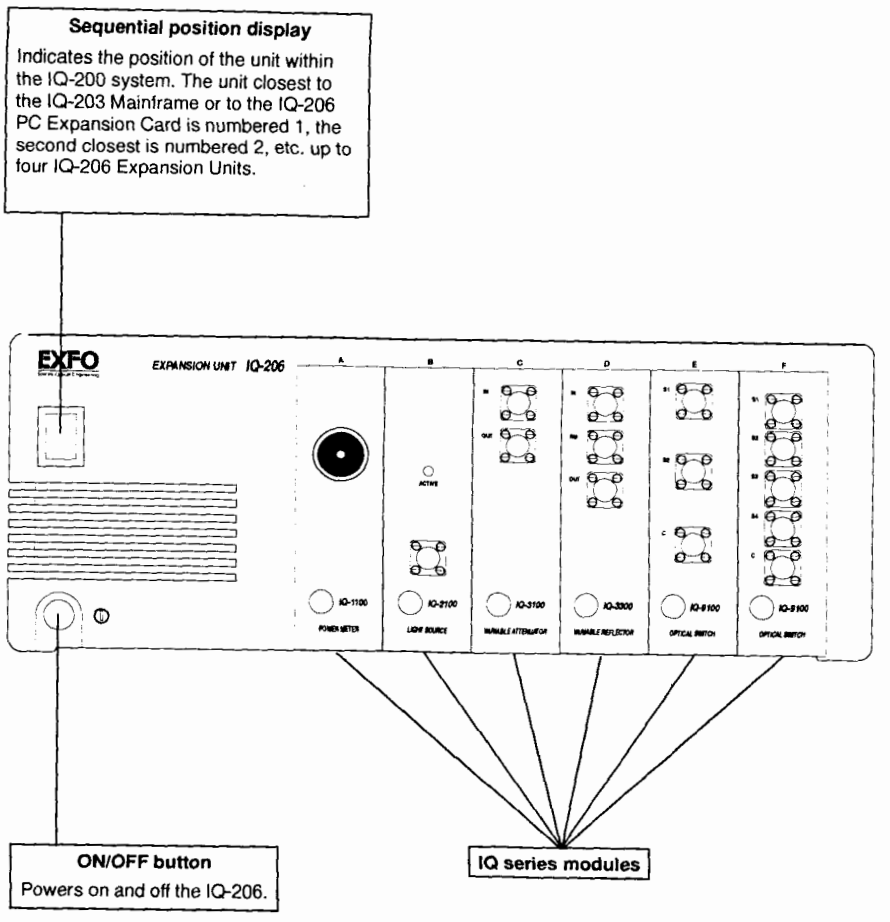


Figure 3-1. IQ-206 Expansion Unit Front Panel

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.2.2 Back Panel

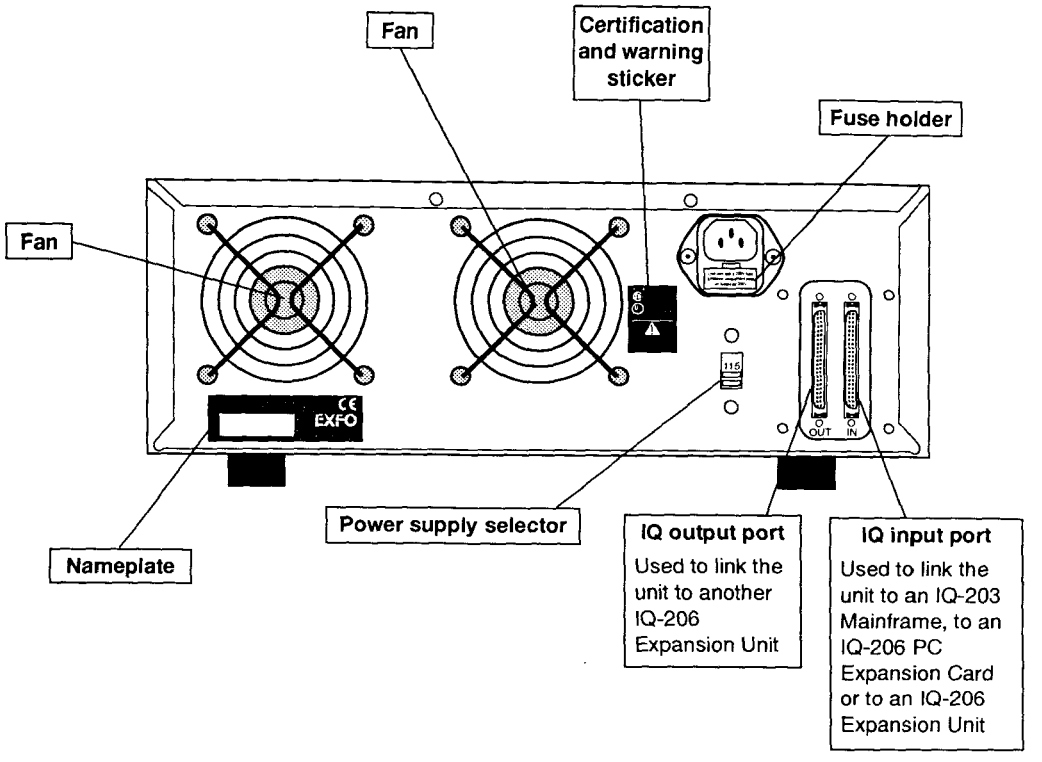


Figure 3-2. IQ-206 Expansion Unit Back Panel

CAUTION

It is extremely important to properly position the power supply selector (at the back of the IQ-206 Expansion Unit) according to the electrical supply being used. Operating the unit while the power supply selector is improperly positioned may result in permanent damage to the unit.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3.2.3 Nameplate

The IQ-206 Expansion Unit nameplate is located on the back panel of the unit.

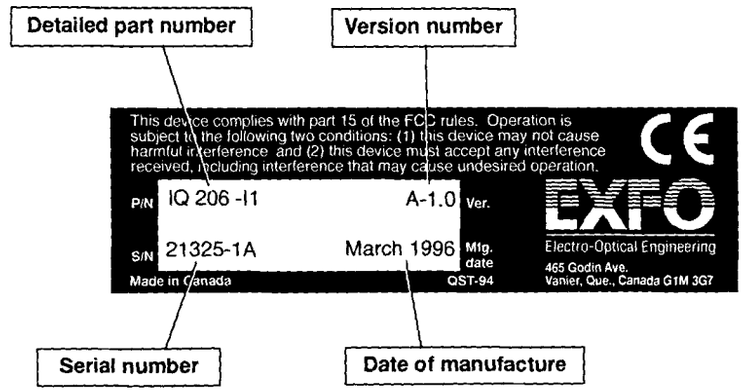


Figure 3-3. IQ-206 Expansion Unit Nameplate

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4 IQ-206 PC EXPANSION CARD

4.1 Unpacking and Inspection

The IQ-206 PC Expansion Card has been thoroughly inspected before shipment. If any damage has occurred during transportation or if any item is missing, please notify EXFO immediately.

The IQ-206 PC Expansion Card is delivered with the following standard items:

- IQ-206 PC Expansion Card
- IQ-200 Optical Test System Instruction Manual
- IQ User's Guide binder with dividers
- IQ Software disks
- GPIB and Application Development Guide
- CE Declaration of Conformity
- Certificate of Quality

Retain the original packaging material in case you need to return the unit.

4.2 IQ-206 PC Expansion Card Description

The IQ-206 PC Expansion Card is designed to emulate an IQ-203 Mainframe. Once installed in a computer, the IQ-206 PC Expansion Card allows the user to control up to four IQ-206 Expansion Units, which represents 24 single slot IQ series modules. To operate the IQ-206 PC Expansion Card, the Windows™ compatible IQ Software needs to be installed on the host computer.

The IQ Software used with the IQ-206 PC Expansion Card is identical to the software on the IQ-203 Mainframe. To install the software on a PC, refer to Section 4.6. For software conventions, controls, and commands, refer to Section 6.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

For information on how to connect the IQ-206 PC Expansion Card to the IQ-206 Expansion Unit(s), refer to Section 5.3.2.

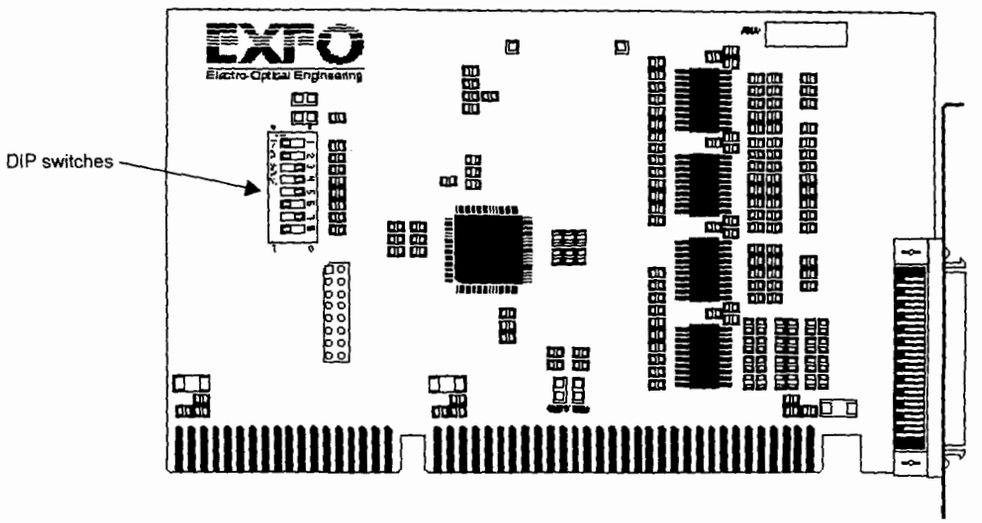


Figure 4-1. Side View of the IQ-206 PC Expansion Card

4.3 Requirements

The computer that will host the IQ-206 PC Expansion Card must be configured with

- 486 SX with 4 MB of RAM (minimum)
- one free expansion slot (AT 98-pin bus)
- Windows 3.1 or Windows for Workgroups 3.11 (not Windows 95 nor Windows NT)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The card itself has

- less than 200 mA power consumption
- an AT clock with a maximum speed of 8MHz

4.4 Hardware Settings

The IQ-206 PC Expansion Card is equipped with eight DIP switches that are used to set the I/O port address and the IRQ number. You must set the I/O port address and the IRQ number on the IQ-206 PC Expansion Card so they do not conflict with any other card or component in your system. Take note of the hardware settings you use on the card; you will be asked to enter these settings at the end of the software installation so the IQ Software knows where to locate the IQ-206 PC Expansion Card within the system. The location of the DIP switches on the IQ-206 PC Expansion Card is illustrated in Figure 4-1. The enlarged view below shows the DIP switches numbered from 1 to 8.

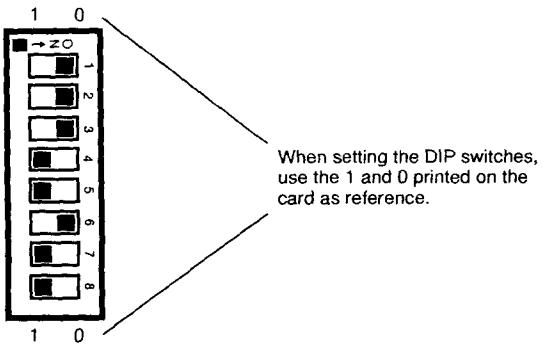


Figure 4-2. DIP Switches Set to Default Configuration (IRQ 15 and 300h)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.4.1 I/O Port Setting

The first five switches (1 to 5) are used to set the I/O port address. The I/O port address is an hexadecimal number and must be any multiple of 020h within the range of 060h to 03C0h. The hexadecimal address is then converted into binary code so the DIP switches can be set to the «1» position (left) or to the «0» position (right) (refer to Figure 4-2). The most commonly used I/O port addresses are listed in the table below.

***Note**: Other I/O ports may be set on the card. If you are unable to determine the DIP switch settings for the desired I/O port, please call EXFO.*

I/O Port Address (hexadecimal)	DIP Switches Setting				
	5	4	3	2	1
0E0h	0	0	1	1	1
100h	0	1	0	0	0
120h	0	1	0	0	1
140h	0	1	0	1	0
160h	0	1	0	1	1
200h	1	0	0	0	0
2A0h	1	0	1	0	1
2C0h	1	0	1	1	0
300h	1	1	0	0	0
320h	1	1	0	0	1
340h	1	1	0	1	0

Table 4-1. I/O Port Setting

***Note**:Default I/O port address is 300h.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4.4.2 IRQ Number Setting

The last three switches (6 to 8) are used to set the IRQ number. The possible IRQ numbers and their corresponding DIP switch settings are listed in the table below.

IRQ Number	DIP Switch Setting		
	6	7	8
IRQ9	0	1	0
IRQ10	1	1	0
IRQ11	0	0	1
IRQ12	1	0	1
IRQ15	0	1	1

Table 4-2. IRQ Number Settings

***Note**: Default IRQ number is IRQ15.*

4.5 IQ-206 PC Expansion Card Installation

The basic steps for IQ-206 PC Expansion Card installation in a computer are as follows:

1. Make sure the chosen host computer meets the requirements stated in Section 4.3.

2. Proceed to IQ-206 PC Expansion Card hardware settings as explained in Section 4.4.

3. Power off the computer and unplug the AC cord.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4. Refer to the computer instruction manual in order to properly disassemble computer cover to gain access to the expansion slots.

5. Handle the IQ-206 PC Expansion Card observing the proper electrostatic discharge precautions (these are given in Section 7.3.1).

6. Insert the IQ-206 PC Expansion Card into any appropriate expansion slot firmly with due care.

7. Secure the card in place.

8. Reassemble computer cover making certain to replace every screw tightly.

9. Install the IQ Software (refer to Section 4.6).

4.6 IQ Software Installation

The IQ Software is provided on 3.5" floppy diskettes. The following procedure may be used to install the IQ Software in a host computer (in order to operate an IQ-206 PC Expansion Card) or to update the IQ Software on an IQ-203 Mainframe. In either case, Microsoft Windows™ 3.1 must already be installed in the host unit.

1. Power off the host unit.

2. Insert the first installation diskette into the appropriate drive.

3. Power on the unit. As the unit boots up, an IQ-200 Software Installation window will appear on the screen.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

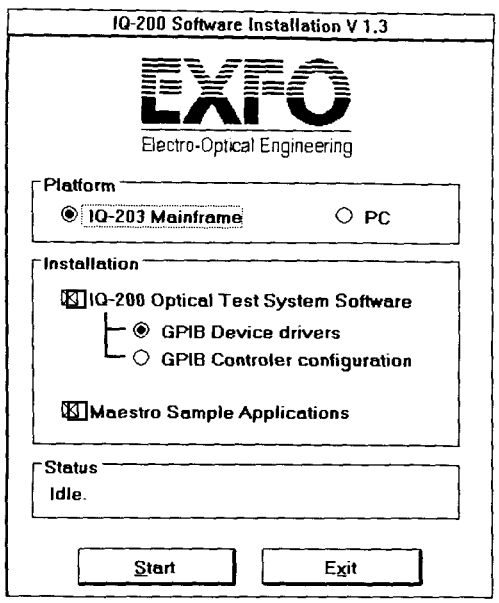


Figure 4-3. IQ Software Configuration Selection

4. From the IQ-200 Software Installation window:

   4 a. Choose **IQ-203 Mainframe** if you are updating the IQ Software on an IQ-203 mainframe, or choose **PC** if you are installing the IQ Software on a host computer with an IQ-206 PC Expansion Card.

   4 b. In the *Installation* box, select the software components to be installed (IQ-200 Optical Test System and/or Maestro Sample Applications).

***Note**: A GPIB configuration must be selected for the IQ Software (device or controller). If you do not plan to use the IQ system in a GPIB environment, select the GPIB device configuration.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5. Choose **Start** to continue the installation. You will be asked to confirm your choices.

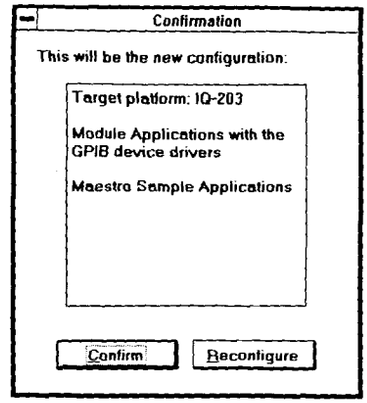


Figure 4-4. IQ Software Configuration Confirmation

6. Choose **Confirm** to initiate the installation procedure or **Reconfigure** to select other settings.

7. Insert the appropriate installation diskettes as they are requested.

   During the installation process, you will notice several sub-installation procedures. The number of sub-installation programs depends on the components you choose to install with the IQ Software: GPIB configuration, Maestro Applications, etc.

IMPORTANT

When installing the Maestro Sample Applications, make sure to insert the Maestro Sample Applications disks.

During installation on a PC, a Program Manager group and icon are created for the IQ Software. The IQ Software icon is shown below.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



Figure 4-5. IQ Software Icon

8. You get a message indicating the IQ Software installation has been successfully completed.

   - If the IQ Software has been installed on a PC computer with an IQ-206 PC Expansion Card, you need to configure the IQ Software so it knows where to find the IQ-206 PC Expansion Card. Choose **Configure PC Card**. See Section 4.7 for detailed information on IQ Software configuration.
   - If the IQ Software has been updated on an IQ-203 Mainframe, you must reboot the IQ-203 Mainframe in order for the changes to take effect.

IMPORTANT

Do not forget to remove the last installation diskette from the disk drive before rebooting the unit.

9. If a Maintenance Kit has been included with your shipment, proceed to install it as indicated on the diskettes. Maintenance Kits provide the latest software updates.

4.7 IQ Software Configuration

When running on a PC, the IQ Software must be configured to match the configuration of the IQ-206 PC Expansion Card. The configuration utility allows you to set the IQ Software drivers to the correct IRQ and base I/O address. For the IQ system to function properly, it is important that no other device uses the same IRQ and base I/O address.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The IQ Software is configured through a small utility that is automatically accessed at the end of the IQ Software installation procedure. Once set, the configuration can be modified at any time by clicking the IQ Software Configuration icon, which appears in the IQ-200 Optical Test System main window.



Figure 4-6. IQ Software Configuration Icon

In either case, the IQ-206 Configuration Utility window appears on the screen.

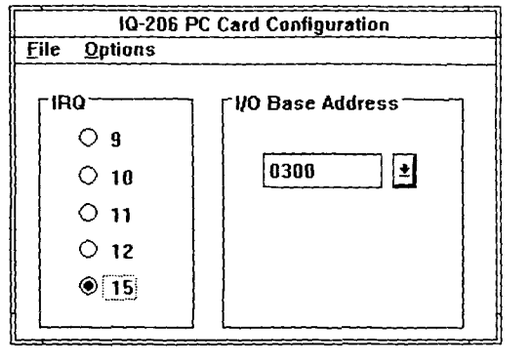


Figure 4-7. IQ-206 Configuration Utility Window

To display the currently used settings, chose *Current Configuration* from the *Options* menu.

To modify the IQ Software configuration

1. From the **IRQ Setting** box, select the radio button corresponding to the IRQ number you previously set on the card.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. From the **I/O Setting** list box, choose the I/O address you previously set on the card.

***Note**: You might have set the IQ-206 PC Expansion Card to an I/O address that is not on the list. In this case, simply type in the I/O address you actually set on the card. Remember the I/O port address must be any multiple of 020h within the range of 060h to 03C0h.*

3. From the *File* menu, choose *Save settings* in order to save the settings you just entered. You will be asked for a confirmation.

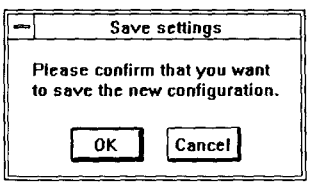


Figure 4-8. Confirming the New Configuration

IMPORTANT

To activate the default configuration, you must save the default configuration settings.

4. From the *File* menu, choose *Exit* in order to exit from the IQ-206 configuration utility.

It is also possible, from the IQ-206 Configuration Utility window, to remove the IQ-206 driver from the SYSTEM.INI file by choosing *Uninstall driver* from the *Options* menu.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5 IQ-200 OPTICAL TEST SYSTEM INSTALLATION

5.1 IQ-200 Component Positioning and Cooling

Refer to the environmental specifications (Section 10) for the recommended environmental conditions for transportation, storage, and operation of each unit. Each IQ-203 Mainframe and IQ-206 Expansion Unit has two internal rear cooling fans. Mount or position the units so that air can circulate freely around them. When operating the unit, choose a location which provides at least

- 75 mm (3 inches) of rear clearance
- 25 mm (1 inch) of side clearance (left and right)
- 25 mm (0.5 inches) of top clearance

Failure to provide adequate cooling clearance may result in excessive internal temperature, thus reducing unit reliability.

5.2 Bench Top and Rack Mount Setup

Whether you select the bench top or rack mount setup for your system, you will always be able to take full advantage of the flexibility and expansion characteristics of the IQ-200 Optical Test System.

5.2.1 Bench Top

For additional flexibility and ease of use, an external color monitor, keyboard, and mouse can be added to the IQ-203 Mainframe. The IQ modules are linked together by means of the IQ-203 interface bus. The system has been designed so that the units can easily and safely be configured to a bench top format (stacked one on top of the other).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

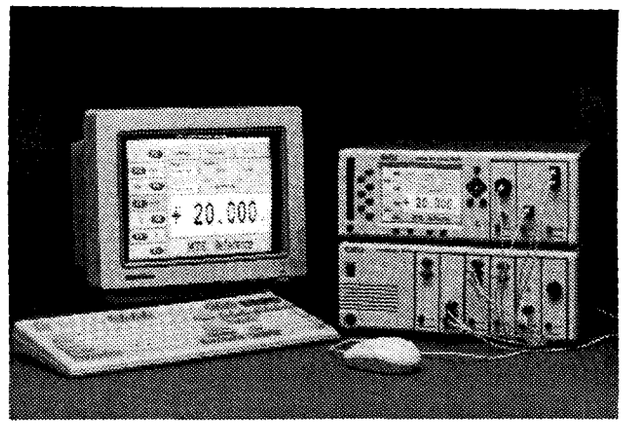


Figure 5-1. IQ-200 Optical Test System Bench Top Setup

5.2.2 Rack Mount

The IQ-200 system can include up to four IQ-206 Expansion Units connected in daisy chain with an IQ-203, which represents 27 linked modules. An efficient setup for all these units consists in of mounting them into any standard 19-inch equipment rack. Before being inserted into a rack, the IQ-203 Mainframe or IQ-206 Expansion Unit must be first installed into an optional rack mount kit.

To install the IQ-203 Mainframe or the IQ-206 Expansion Unit into a rack mount kit

1. Assemble the rack mount panels and handles using the screws and the lockwashers supplied with the kit.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

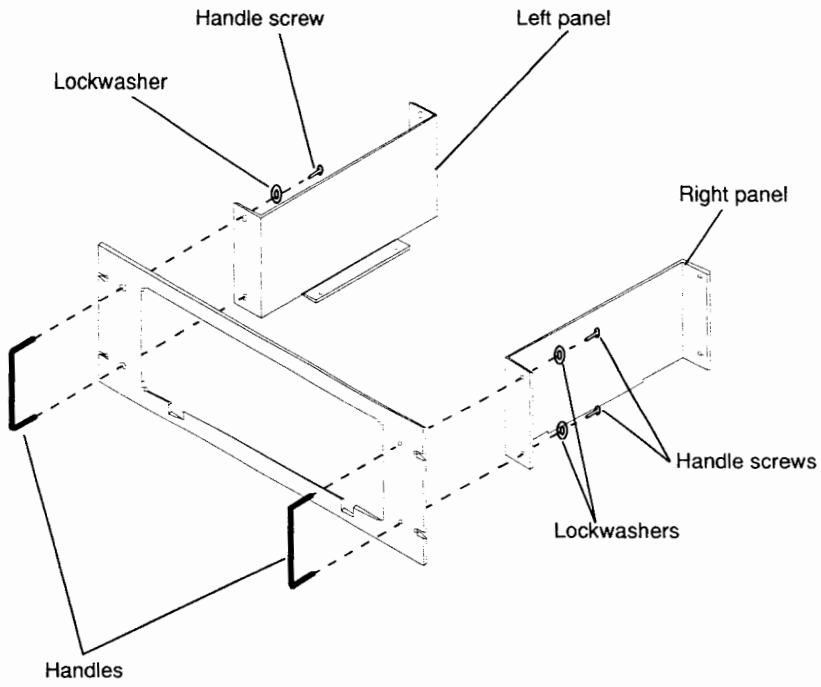


Figure 5-2. Optional Rack Mount Kit Assembly

2. Power OFF the IQ-203/IQ-206.

3. Remove the four bottom cover screws under the IQ-203/IQ-206.

4. Slide the IQ-203/IQ-206 through the rack mount front panel, inward with the front of the unit facing the user. Be careful not to break the warranty stickers on the IQ-203/IQ-206.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

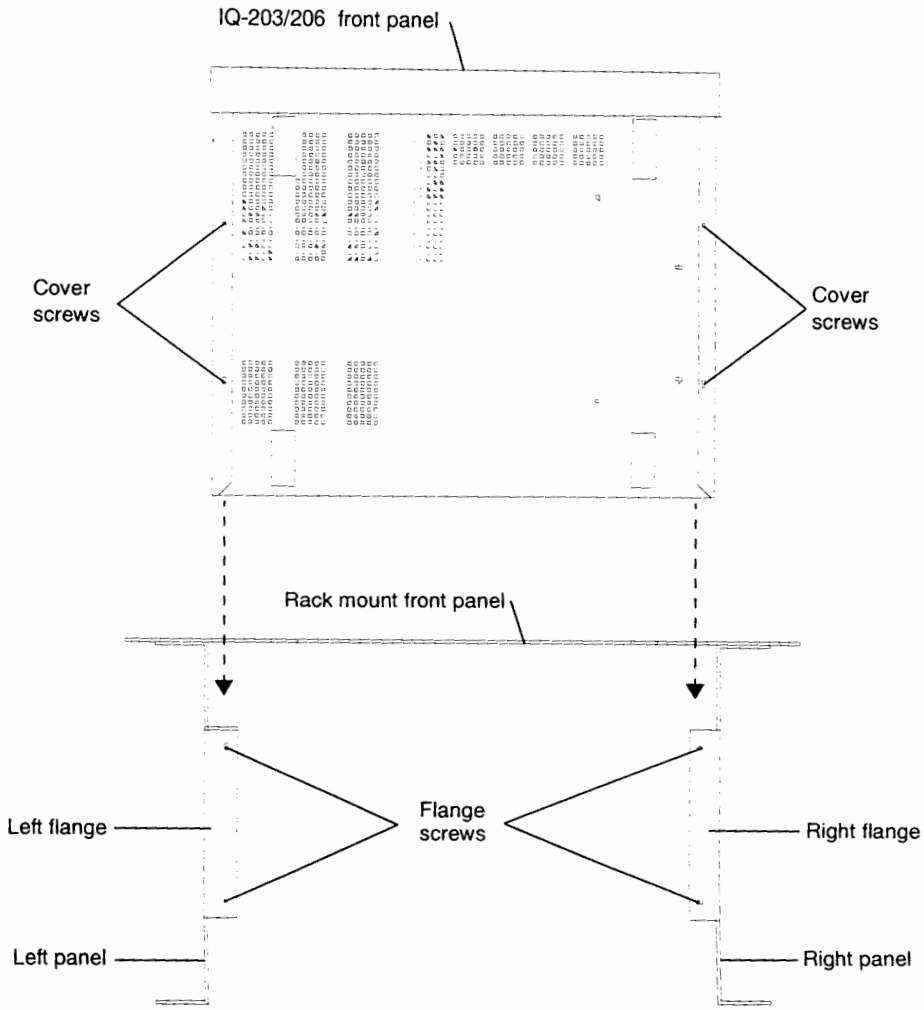


Figure 5-3. Rack Mount Kit — Bottom View

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5. Use the flange screws and the flat washers supplied with the kit to secure the IQ-203/IQ-206 onto the rack mount flanges.

6. Insert the rack-mounted IQ-203/IQ-206 into the cabinet and secure in place using the hardware supplied with the rack.

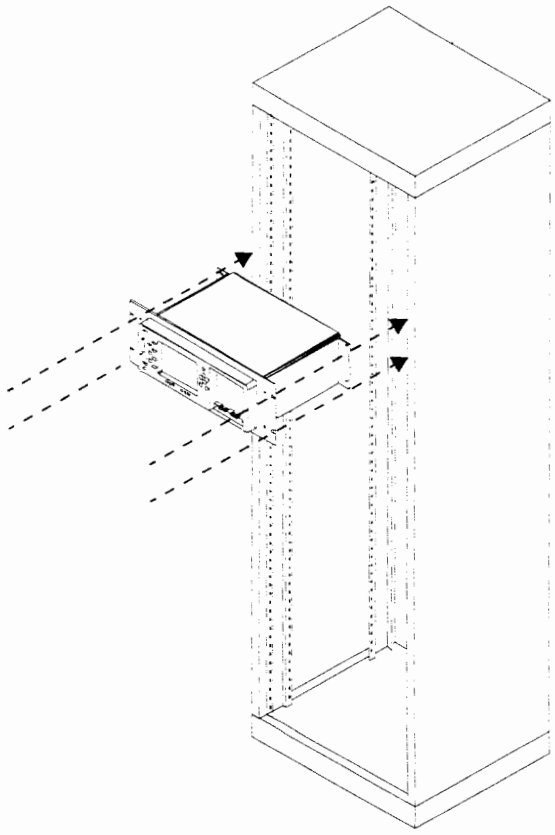


Figure 5-4. Rack Mount Cabinet

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.3 Connecting the IQ Components

5.3.1 Connecting an IQ-203 Mainframe to IQ-206 Expansion Units

As previously explained, the IQ-203 Mainframe can be connected to up to four IQ-206 Expansion Units, which represents a total of 27 single-slot modules. The necessary interface cable to connect an IQ-206 Expansion Unit to another IQ-206 Expansion Unit or to an IQ-203 Mainframe is supplied with the IQ-206 Expansion Unit. The necessary connections are shown in Figure 5-5.

***Note**: As the IQ-206 Expansion Units are daisy chained, in order to easily identify them within the system, a number appears in their sequential position display, on the front panel of the unit. The expansion unit connected to the IQ-203 is numbered 1, the next is numbered 2 and so on.*

IMPORTANT

For proper connection, firmly push the IQ interface cable into the appropriate port until it clicks twice. Improper connection may cause operation problems.

IMPORTANT

IQ interface cables are offered in 2.5 and 5-feet lenghts. For proper operation, the IQ interface cables used in a system should not total more than 10 feet.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

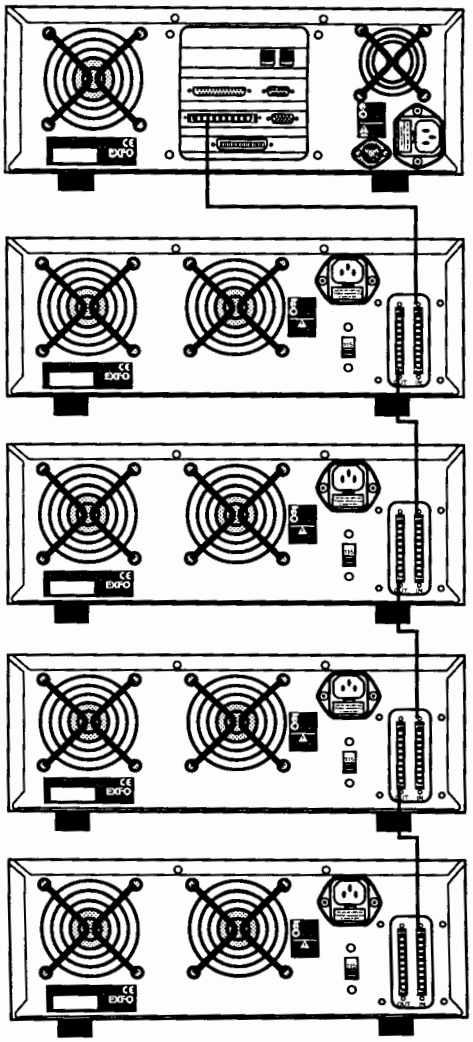


Figure 5-5. IQ-203 Mainframe Connected to 4 Expansion Units

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.3.2 Connecting an IQ-206 PC Expansion Card to IQ-206 Expansion Units

Once installed into a PC computer, the IQ-206 PC Expansion Card can control up to four IQ-206 Expansion Units, which represents a total of 24 single-slot modules. The necessary interface cable to connect an IQ-206 Expansion Unit to another IQ-206 Expansion Unit or to an IQ-203 Mainframe is supplied with the IQ-206 Expansion Unit. The necessary connections are shown in Figure 5-6.

***Note**: As the IQ-206 Expansion Units are daisy chained, in order to easily identify them within the system, a number appear in their sequential position display. The expansion unit connected to the IQ-206 PC Expansion Card is numbered 1, the next is numbered 2 and so on.*

IMPORTANT

For proper connection, firmly push the IQ interface cable into the appropriate port until it clicks twice. Improper connection may cause operation problems.

IMPORTANT

IQ interface cables are offered in 2.5 and 5-feet lenghts. For proper operation, the IQ interface cables used in a system should not total more than 10 feet.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

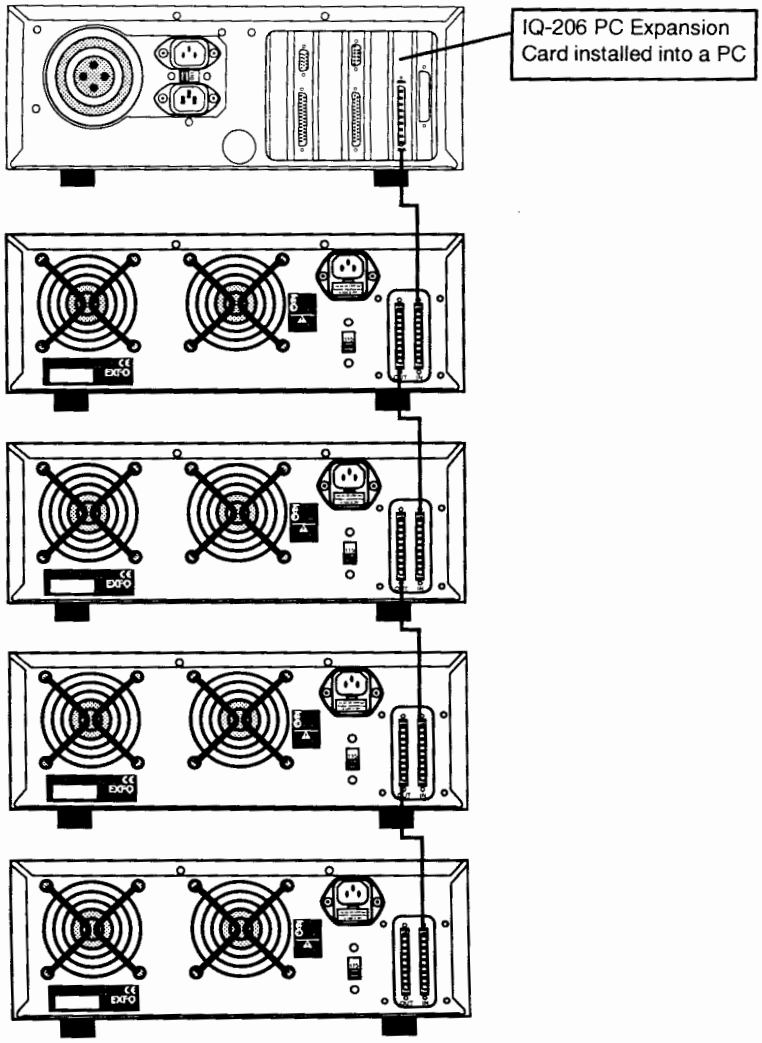


Figure 5-6. IQ-206 PC Expansion Card Connected to 4 Expansion Units

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.4 IQ Series Module Insertion

CAUTION

Never insert or remove any 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 insert the IQ Series modules in the IQ-203 Mainframe/IQ-206 Expansion Unit

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

2. Remove the cover plate of any unused module slot. To remove a cover plate, pull the bottom of the plate and remove it completely.

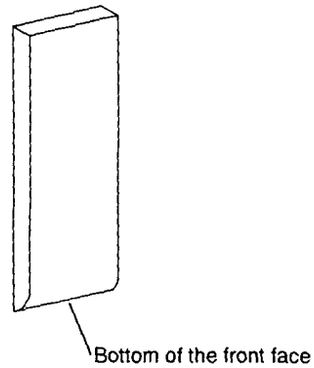


Figure 5-7. Bottom of the Front Face

3. Insert the IQ series module into the slot and push it in firmly until it is flush with the IQ-203/IQ-206 front panel.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.5 IQ Series Module Removal

CAUTION

Never insert or remove any 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 the IQ Series modules from the IQ-203 Mainframe/IQ-206 Expansion Unit

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

2. Place fingers under the bottom of the front face of the module and firmly pull module outward.

3. Put a supplied protective cover over the empty slot in order to prevent dust from entering the module housing.

5.6 GPIB Compatibility

In addition to stand-alone operation, the IQ-200 Optical Test System can be configured either as a GPIB device or as a GPIB controller. The GPIB and Application Development Guide, included with each IQ-203 Mainframe and IQ-206 PC Expansion Card, explains the different integrated configuration options and describes in detail how to create high level integrated applications.

5.6.1 The IQ-200 System as a GPIB Device

The GPIB device configuration permits a user to control the IQ-203 Mainframe and its modules (including any IQ-206 Expansion Unit connected to the IQ-203 Mainframe) from an independent system via a GPIB interface. This setup requires a GPIB device expansion card installed in the IQ-203 Mainframe.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CAUTION

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

In this case the GPIB controller card (available from several manufacturers) and application software (provided by the user) are installed in the host PC.

Applications can be created in any programming environment capable of communicating with a GPIB compatible instrument. For more information on the GPIB compatibility of the IQ-200 Optical Test System, please call EXFO or refer to the GPIB and Application Development Guide.

5.6.2 The IQ-200 System as a GPIB Controller

The GPIB controller configuration permits a user to control other GPIB compatible components and instruments from an IQ-200 Optical Test System. This setup requires a GPIB controller card installed in the IQ-203 Mainframe.

CAUTION

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

Applications can be written using any programming environment that supports both DDE and GPIB communication. Commercial development kits are available for all of the major programming languages. For more information on the GPIB compatibility of the IQ-200 Optical Test System, please call EXFO or refer to the GPIB and Application Development Guide.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6 IQ SOFTWARE

6.1 Software Conventions

6.1.1 Mouse Operation Terminology

"**Click,**" "**Choose,**" and "**Double Click**" are used throughout the IQ Series manuals when referring to software operation.

- "**Click**" signifies that, after placing the cursor on the desired object using the desktop or IQ-203 front panel mouse, the user shall press once on the left mouse button to begin the specific operation related to the object.

- "**Choose**" signifies that, after placing the cursor on the desired software button using the mouse, the user shall press once on the left mouse button to begin the specific operation related to the button.

- "**Double-click**" signifies that, after placing the cursor on the desired object using the mouse, the user shall quickly press twice on the left mouse button to begin the specific operation related to the object.

***Note**: Certain operations require double-clicking the right mouse button. For these operations, it will always be specified to use the right mouse button.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.1.2 IQ-203 Front Panel Mouse Operation

The front panel mouse operates as a standard computer mouse.

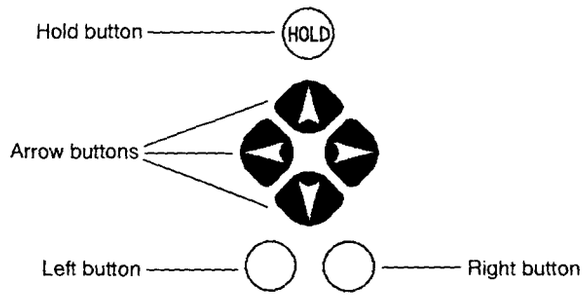


Figure 6-1. IQ-203 Front Panel Mouse

- Press the HOLD button once to initiate the mouse drag function.
- Use the arrow buttons to move the mouse cursor.
- Press the left button to select an item.

Dragging Example:

1. Using the arrow buttons, position the cursor on the selection.
2. Activate the mouse drag function by pressing the HOLD button.
3. Drag the selection to the desired position using the arrow buttons.
4. Press the left button to drop the selection and deactivate mouse drag.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.1.3 Software Items

The following standard Windows™ software items are found in most IQ-200 application windows. Standard mouse operation techniques can be employed for easy use of these items.

Software Buttons

Software buttons on the screen initiate an action or open a secondary window.

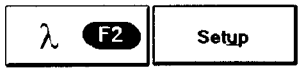


Figure 6-2. Software Buttons

Edit Boxes

An edit box is a data display and entry box that contains a value that may be modified by the user.

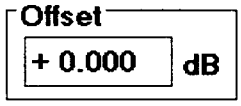


Figure 6-3. Edit Box

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

List Boxes

A list box appears on the screen as a single value, with a pull-down arrow to the right of the value. The list box actually contains a number of values, any one of which may be selected.

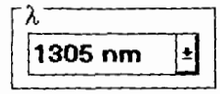


Figure 6-4. List Box

Radio Buttons

Radio buttons are grouped in boxes and provide a choice between two or more options. Only one radio button may be selected at a time.

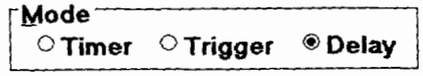


Figure 6-5. Radio Buttons

Check Boxes

Check boxes offer the possibility of selecting and deselecting single or multiple options.

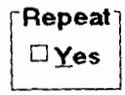


Figure 6-6. Check Box

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.1.4 IQ-203 Front Panel Keys

IMPORTANT

The IQ-203 front panel keys may be used in two different ways: either as hardware keys, as described in the following table, or to activate the software function buttons in an application main window.

Front Panel Keys	Function
IQ	• When another Windows™ application is running, press IQ to return to the IQ Software. • When an IQ application main window is open, press IQ to open the corresponding monitor window. • When several monitor windows are open, press IQ to switch between them. • When all IQ-200 Optical Test System lights are off (refer to Section 6.4.1), press IQ to return to normal LCD and LED display.
→|	• Use this key as a tab to move between window items.
↑	• Use this key as an increment (up) key to scroll upwards in a list box.
☑	• Use this key to select a checkbox option.
↓	• Use this key as a decrement (down) key to scroll downwards in a list box.
↵	• Use this key as a normal return/enter to choose an object or select an option.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

In an IQ application main window, apart from the functions described in the previous table, the front panel keys can also be used to activate the software buttons that are aligned with them, on the left side of the IQ-203 Mainframe screen. For example, in the IQ-9100 main window, each IQ-203 front panel key would correspond to

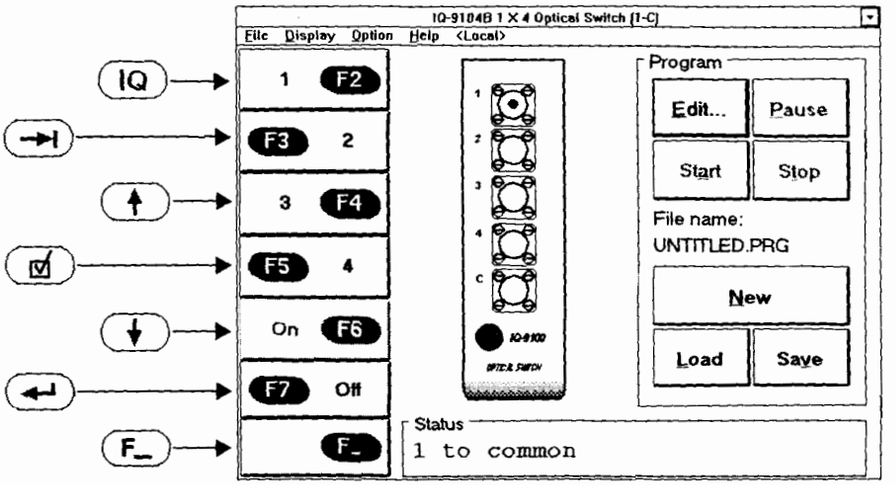


Figure 6-7. Relation between Front Panel Keys and Software Buttons

***Note**: Depending on the application, the window and the software function buttons may differ from those depicted in the illustration.*

Use the (F_) front panel key to activate and deactivate the software buttons.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.1.5 Optional Hardware Keyboard Operation

An optional hardware keyboard can also be used to access the software items.

To choose a software button

1. Press < TAB> until the desired button is highlighted.
2. Press <SPACE BAR> or <ENTER> to press the button.

To change the value inside an edit box

1. Press < TAB> until the cursor is in the desired edit box.
2. Type the new value.
3. Press < ENTER > to confirm the value.

To select a list box value

1. Press < TAB> until the desired list box is highlighted.
2. Use the <UP ARROW> or <DOWN ARROW> key to highlight a new value from the list.

To select a radio button

1. Press < TAB> until the desired radio button box is highlighted.
2. Using the <RIGHT ARROW> or <LEFT ARROW> key, select the new radio button.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

To select a check box option

1. Press < TAB> until the desired check box is highlighted.

2. Press <SPACE BAR> to select the option.

6.1.6 Entering Numeric Values

To enter a numeric value into any edit box when an external keyboard is not available

1. Double-click the edit box, using the right mouse button. A keypad window will appear.

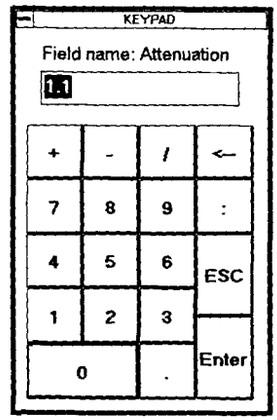


Figure 6-8. Keypad Window

2. Choose the appropriate buttons corresponding to the desired value.

Note:

- *Enter a positive or negative value using the [+] or [-] keys.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- *Choose* ⇦ *to erase a digit.*
- *Choose* : *to enter time values.*

3. Choose Enter to confirm the selection and return to the previous window.

***Note**: Choose ESC to leave the keypad window without updating the value.*

6.1.7 Entering Alphanumeric Values

To enter an alphanumeric value when an external keyboard is not available

1. Using the right mouse button, double-click in the field where an alphanumeric value is needed. A software keyboard window will appear.

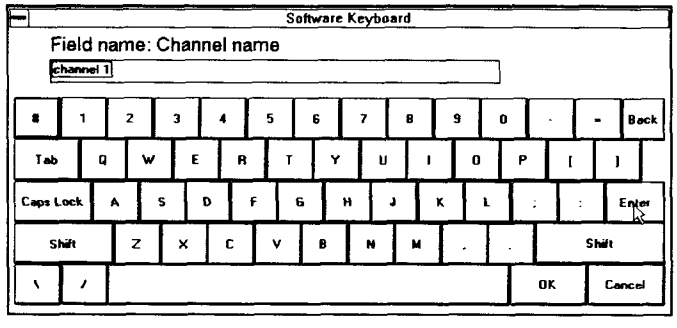


Figure 6-9. Software Keyboard

2. Type in the text.

***Note**: The Back button is used to erase a character.*

3. Choose Enter to go to the next line within a multi-line field.
4. Choose OK to confirm the selection and return to the previous window.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

***Note**: To leave the software keyboard window without updating the edit box, choose* **Cancel**.

6.2 Getting Started with the IQ-203 Mainframe

When you receive the IQ-203 Mainframe, the IQ Software should already be installed. Before powering on the IQ-203 Mainframe and the IQ-206 Expansion Unit, it is recommended to carefully read the previous sections of this instruction manual in order to ensure that

- the safety precautions given in Section 1.3.2 are respected,
- the power requirements given in Section 1.3.3 are respected,
- the units are properly connected together via the IQ interface cable as specified in Section 5.3.1, and
- each unit is plugged in the appropriate electrical outlet as specified in Section 1.3.4

WARNING

Any failure to respect the safety and operation guidelines given in this manual may void the product warranty and could result in product damage or destruction, and/or personal injury.

Several recommendations are also given in Section 5.1 and 5.2 regarding the positioning of the units.

While powering on the IQ-200 Optical Test System, it is important to follow this procedure:

1. Make sure all safety precautions have been taken and that all units are properly connected.

2. Insert the desired modules into the IQ-203 Mainframe and the IQ-206 Expansion Unit (a module installation procedure is given in Section 5.4).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CAUTION

Never insert any module when the IQ-203 Mainframe or the IQ-206 Expansion Unit is powered on. This would result in immediate irreparable damage to the module and to the IQ-203/IQ-206.

CAUTION

Before powering on the IQ-206 Expansion Unit, it is extremely important to properly position the power supply selector, located at the back of the unit, according to the electrical supply being used (refer to Section 1.3.3). Operating the unit while the power supply selector is improperly positioned may result in permanent damage to the unit.

3. Power on the IQ-206 Expansion Unit(s) by pushing the ON/OFF button located in the bottom left corner of the unit(s).

IMPORTANT

The modules inserted in the IQ-206 Expansion Unit(s) must be electrically powered for the IQ Software to recognize them, so always power on the IQ-206 Expansion Unit(s) before powering on the IQ-203 Mainframe.

4. Power on the IQ-203 Mainframe by pushing the ON/OFF button located in the bottom left corner of the unit. At power on, the IQ-203 Mainframe in sequence

   - performs a ScanDisk (see Section 7.1.2),
   - loads the Windows™ software,
   - loads the IQ Software and opens the IQ-200 Optical Test System window.
   - performs a self test during which all IQ modules LED push-buttons, in the mainframe and in the expansion unit(s), light up in sequence, demonstrating that communication has been established.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

For more information on the IQ Software and an illustration of the IQ-200 Optical Test System window, refer to Section 6.4. If any problem is encountered, please refer to Section 8.

6.3 Getting Started with the IQ-206 PC Expansion Card

After installing the IQ-206 PC Expansion Card into your computer, you must install the IQ Software. Instructions on card and software installation are given in Section 4.5 and 4.6. Before starting up the IQ-200 Optical Test System, it is recommended to carefully read the previous sections of this instruction manual in order to ensure that

- the safety recommendations given in Section 1.3.2 are respected,
- the power requirements given in Section 1.3.3 are respected,
- the units are properly connected together via the IQ interface cable as specified in Section 5.3.2, and
- each unit is plugged in the appropriate electrical outlet as specified in Section 1.3.4

WARNING

Any failure to respect the safety and operation guidelines given in this manual may void the product warranty and could result in product damage or destruction, and/or personal injury.

Several recommendations are also given in Section 5.1 and 5.2 regarding the positioning of the units. For information on host computer operation, refer to the host computer instruction manual.

While powering on the IQ-200 Optical Test System, it is important to follow this procedure:

1. Make sure all safety precautions have been taken and that all units (host computer and IQ-206 Expansion Units) are properly connected.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. Insert the desired modules into the IQ-206 Expansion Unit (a module installation procedure is given in Section 5.4).

CAUTION

Never insert any module when the IQ-206 Expansion Unit is powered on. This would result in immediate irreparable damage to the module and to the IQ-206 Expansion Unit.

CAUTION

Before powering on the IQ-206 Expansion Unit, it is extremely important to properly position the power supply selector, located at the back of the unit, according to the electrical supply being used (refer to Section 1.3.3). Operating the unit while the power supply selector is improperly positioned may result in permanent damage to the unit.

3. Power on the IQ-206 Expansion Unit(s) by pushing the ON/OFF button located in the bottom left corner of the unit(s).

IMPORTANT

The modules inserted in the IQ-206 Expansion Unit(s) must be electrically powered for the IQ Software to recognize them, so always power on the IQ-206 Expansion Unit(s) before loading the IQ Software.

4. Power on the IQ-206 PC Expansion Card host computer and load the Windows™ software.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5. From the Windows™ Program Manager, double-click on the IQ Software icon to load the IQ Software.



Figure 6-10. IQ Software Icon

As the IQ Software loads, the IQ-200 Optical Test System window appears on the screen.

The IQ Software also performs a communication test to detect the IQ series modules inserted in the IQ-206 Expansion Unit(s). All IQ module LED push-buttons should light up in sequence, indicating that communication has been established.

For more information on the IQ Software and an illustration of the IQ-200 Optical Test System window, refer to Section 6.4. If any problem is encountered, please refer to Section 8.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.4 IQ-200 Optical Test System Window

When the IQ Software is loaded, the IQ-200 Optical Test System window opens as illustrated below.

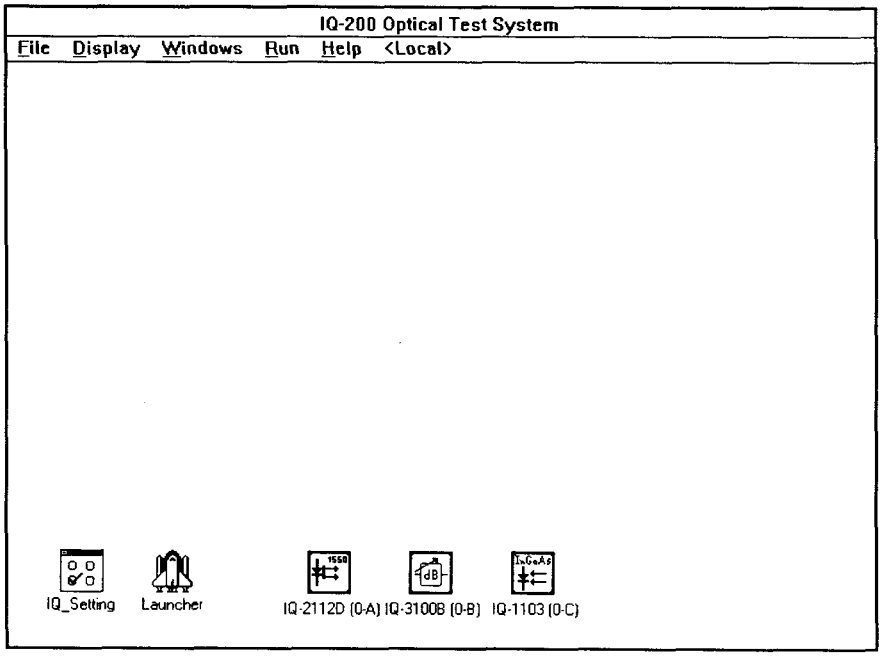


Figure 6-11. IQ-200 Optical Test System Window

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.4.1 Menu Bar

The following table describes the contents of the IQ-200 Optical Test System menus.

Menu	Option	Function
File	Open config...	Opens a previously saved configuration.
	Save config...	Saves the current configuration.
	Exit	Exits the IQ Software.
Display	LCD	Displays the IQ Software only on the IQ-203 Mainframe screen.
	CRT	Displays the IQ Software only on external monitor, if used.
	Close all lights	Switches off all lights on the IQ system components. All screens and module lights will thus be shut off; floppy disk access light and hard disk drive LED may illuminate from time to time. Once screens and lights are off, press the (IQ) front panel key to switch lights on.
	Disable front panel keys	Disables the IQ-203 Mainframe front panel keys. To re-enable the front panel keys, select this option again using an external keyboard or mouse.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Menu	Option	Function
Windows	Cascade	Arranges the open application windows on the screen in a standard Windows™ cascade format.
	Tile	Arranges the open application windows on the screen in a standard Windows™ tile format.
Run	Program Manager	Opens Windows™ Program Manager.
	Control Panel	Opens Windows™ Control Panel.
	File Manager	Opens Windows™ File Manager.
	SCPI Manager	Opens the SCPI Manager (for information on the SCPI Manager, refer to the GPIB and Application Development Guide).
Help	Contents...	Opens the IQ-200 Optical Test System help file.
	About...	Opens a window which provides the following information: • software version • technical assistance telephone numbers • available IQ-203 system memory (includes RAM and virtual memory) • remaining hard disk drive storage space • IQ load: this value refers to the current load on the IQ-200 Optical Test System. The IQ load can be used up to 100% without any problem.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

In the menu bar, you also find the inscription <local>, <remote>, or <lockout>, which indicates the control status of the modules as described in the table below. For more information on how to control the IQ-200 Optical Test System through a GPIB link, refer to the GPIB and Application Development Guide.

Indication	Meaning
<local>	The IQ-200 Optical Test System is controlled locally.
<remote>	The IQ-200 Optical Test System is controlled through a GPIB link but local commands can still be used.
<lockout>	The IQ-200 Optical Test System is exclusively controlled through a GPIB link.

6.4.2 IQ Setting

The IQ Setting icon appears at the bottom of the IQ-200 Optical Test System window.



Figure 6-12. IQ Setting Icon

Double-clicking on this icon opens the IQ Setting window, from which you can customize the IQ Software.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

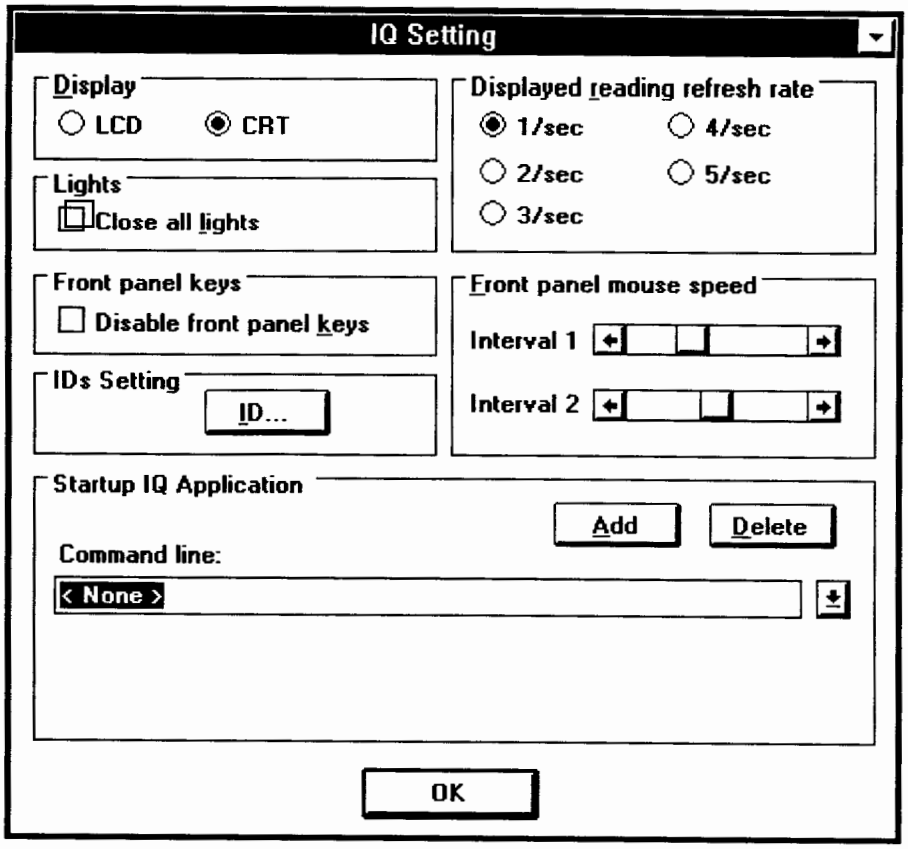


Figure 6-13. IQ Setting Window

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

IQ Setting window item	Options	Description
Display	LCD	Displays the IQ Software only on the IQ-203 Mainframe screen.
	CRT	Displays the IQ Software only on external monitor, if used.
Lights	Close all lights	Switches off all lights on the IQ system components. All screens and module lights will thus be shut off; floppy disk access light and hard disk drive LED may illuminate from time to time. Once screens and lights are off, press the (IQ) front panel key to switch lights on.
Front panel keys	Disable front panel keys	Disables the IQ-203 Mainframe front panel keys. To re-enable the front panel keys, select this option again using an external keyboard or mouse.
IDs Setting	–	Opens the Module Identification window, allowing the user to rename the modules in the IQ Optical Test System (for more information refer to Section 6.5).
Displayed reading refresh rate	1 to 5 times per second	Sets the number of times per second the readings are refreshed on the screen. Does not necessarily correspond to the actual number of readings taken by the test modules. Depending on the IQ load, the refresh rate may be limited.
Front panel mouse speed	Interval 1	Sets the delay for the first increase in tracking speed.
	Interval 2	Sets the delay for the second increase in tracking speed.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

IQ Setting window item	Options	Description
Startup IQ Application	–	Allows to start an application automatically when IQ-200 Optical Test System is loaded. For details refer to Section 6.6.
OK	–	Confirms the selection and returns to the IQ-200 Optical Test System window.

6.4.3 IQ Series Module Icons

The IQ module icons are displayed in the IQ-200 Optical Test System window. The icons displayed represent the modules detected by the IQ-200 Optical Test System at power up, during the self test. When the module application is closed, the module icon appears red (on color monitor) with a frame.



Figure 6-14. Closed Module Application Icon

When the module application is open and its monitor window is minimized, the module icon appears green (on color monitor) without a frame.



Figure 6-15. Open Module Application Icon

The module icons contain information (directly below the icon) indicating the module type and position. The module position is represented by

- a number, telling in which unit the module is located. 0 for the IQ-203 Mainframe, and 1 to 4 for the IQ-206 Expansion Units.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- a letter, telling which slot the module occupies in the unit. A to C for the IQ-203 Mainframe, and A to F for the IQ-206 Expansion Units.

For example, the icon shown in Figure 6-15 contains the following information:

- the symbol indicates that the module is an IQ-3100B variable attenuator
- the absence of frame around the symbol shows that the application is active
- the module is inserted in the IQ-203 Mainframe (0) second slot (B)

6.5 Module Identification

The text in the title bar of a module application may be customized. This could be useful when using several modules of the same type. To customize the text, choose the ID button from the IQ Setting window. This will open the Module Identification window.

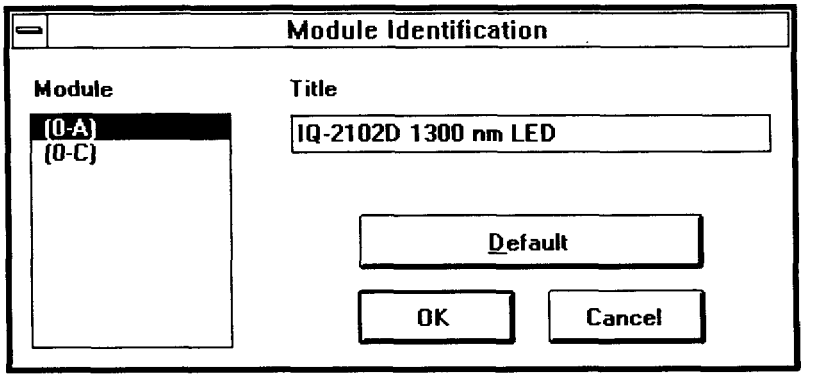


Figure 6-16. Module Identification Window

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

For each module, from the Module Identification window, you can

- select a specific module and see its corresponding title.
- change the module title by typing a new name in the title box.
- return to the default title by choosing [Default].

6.6 IQ Application at Startup

It is possible to configure the IQ-200 Optical Test System so a specific application automatically launches when the IQ Software is loaded. This feature is useful when the IQ system is being used as a dedicated workstation where the same application is loaded each time the system is used.

As example, any of the Maestro Applications, that are a standard component of the IQ Software package, can be chosen to launch at startup. The application to be launched at startup is specified by typing the appropriate command line at the bottom of the IQ Setting window.

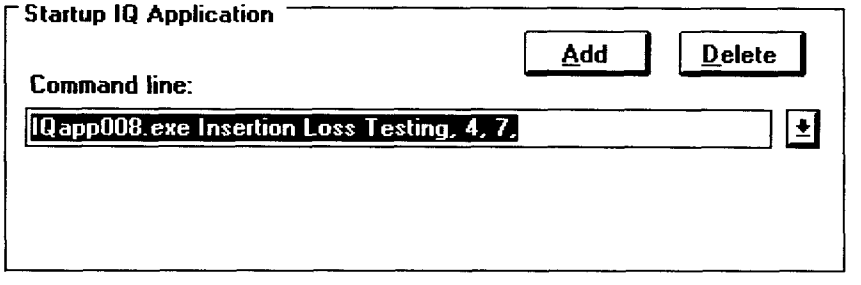


Figure 6-17. Startup Command Line

The command line must respect the following format

[Executable filename]<space>[title bar text], [module1 position], [module2 position], [moduleX position]

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The command line includes the executable file name corresponding to the chosen application as well as the location of the required modules within the IQ-200 Optical Test System.

The table below gives the standard Maestro Applications, identifies their corresponding executable file name, and lists the required modules for each application.

Application	File Name	Module 1	Module 2	Module 3
Source Power Stability	IQapp001.exe	IQ-1100		
Source Power Stability vs Reflection	IQapp003.exe	IQ-3300	IQ-1100 or IQ-1200	
Variable Source	IQapp005.exe	IQ-2100	IQ-3100	IQ-1100
Insertion Loss	IQapp008.exe	IQ-2100	IQ-1100	

The table below indicates the module position numbers for each slot in a complete IQ-200 Optical Test System.

Unit	Slot A	Slot B	Slot C	Slot D	Slot E	Slot F
IQ-203 Mainframe	0	1	2			
IQ-206 Expansion Unit #1	3	4	5	6	7	8
IQ-206 Expansion Unit #2	9	10	11	12	13	14
IQ-206 Expansion Unit #3	15	16	17	18	19	20
IQ-206 Expansion Unit #4	21	22	23	24	25	26

For an application to launch at startup

1. Power off the IQ-200 Optical Test System.

2. Insert the required module for the desired application in any available slot.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3. Power on the IQ-200 Optical Test System.
4. Access the *IQ Setting* window by double-clicking on the *IQ Setting* icon.
5. In the *IQ Setting* window, type in a command line according to the preceding guidelines.
6. Choose **Add**.
7. Highlight the command line from the list box.
8. Choose **OK**.
9. Open all required modules applications.
10. Open the SCPI Manager in DDE mode. To do so:
    - 10 a. In the *IQ-200 Optical Test System* window, choose *SCPI Manager* from the *Run* menu.
    - 10 b. In the *SCPI Manager* window, choose *Parameters* from the *Communications* menu.
    - 10 c. In the *Communication Parameters* window, select **DDE** as type of connexion.
    - 10 d. Choose **Ok**.
11. In the *IQ-200 Optical Test System* window, choose *Exit* from the *File* menu.
12. The message "Closing the IQ-200 now will close all module applications" will appear. Choose **Ok**.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

13. The message "Do you want to save the configuration?" will appear. Choose **Yes**.

The next time the IQ Software loads, the selected application will start.

6.7 IQ Maestro Applications

The IQ-200 Optical Test System includes a series of software applications integrating the operation of one or more IQ modules into a step-by-step procedure. These applications are called the Maestro Applications. There are three different types of Maestro Applications:

- Sample Maestro Applications (included as part of the standard software package)
- IQ-12000 series applications (developed and sold by EXFO)
- Custom applications (applications developed by EXFO upon request)

These applications are executed from the Application Launcher. They can also be launched automatically at startup (see Section 6.6).

The Launcher icon appears at the bottom of the IQ-200 Optical Test System window.



Figure 6-18. Launcher Icon

Double-clicking on this icon opens the Maestro Application Launcher window, from which you can select and configure the application and the required module, then launch a Maestro Application.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

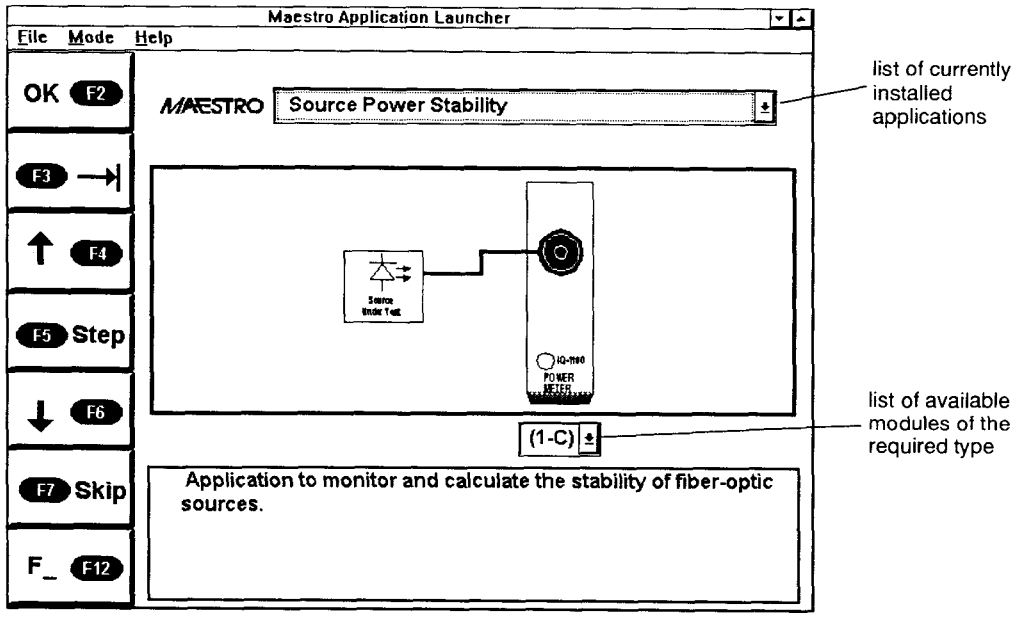


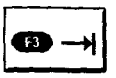
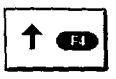
Figure 6-19. Maestro Application Launcher Window

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.7.1 Menus

Menu	Option	Function
File	Exit	Exits the Launcher.
Mode	Lockout	When selected this option locks out local use of the IQ modules. When in lockout all of the IQ system modules can be controlled only from a high level software application such as a Maestro application. Lockout prevents local users from tampering with module settings while an application is in progress. When not in lockout, modules that are not being used by the application can be used as stand-alone instruments.
	Start Modules	When selected the launcher will automatically open the required module programs. This option is normally left on.
Help	About	Opens a window providing Launcher software version and telephone numbers and addresses for technical assistance.

6.7.2 Function Buttons

Button	Description
	Starts the selected application with the selected modules.
	Navigates from one screen object to the next.
	Moves up in a list box or combo box.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Button	Description
F5 Step	Goes to a specific step of an application when running a Maestro Application.
↓ F6	Moves down in a list box or combo box.
F7 Skip	Skips a step when running a Maestro Application.
F_ F12	Not currently used in the Launcher or in the Maestro applications.

6.7.3 Selecting Modules

In some cases, more than one module of a required type may be available. In this situation, select the module that you want to use for the application. In the example shown below, the IQ-2100 source module located in position 0-B (the middle slot of the IQ-203) will be used for the application.

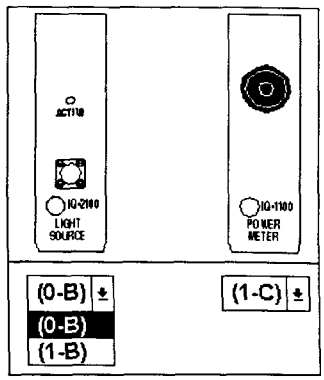


Figure 6-20. Selecting Modules

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

***Note**: If all the modules required for a specific application are not available, a message indicating the missing modules will be displayed and the OK button will be deactivated.*

6.7.4 Running a Maestro Application

Once an application and the required modules have been selected in the Launcher, choose the **OK** button to start the application. At this time, the system will open the required programs and initialize the modules. Once the initialization is complete, instructions and images will be presented that clearly indicate each step of the given procedure. In most cases, choosing the **OK** button or pressing the **ENTER** key on the keyboard advances to the next step.

IMPORTANT

In order to control the IQ modules, the Launcher and the Maestro Applications communicate via the SCPI Manager in DDE communication mode. If the SCPI Manager is not open, opening the Launcher will automatically open the SCPI Manager with the correct parameters. If the SCPI Manager is already open in GPIB communication mode, the Launcher will be unable to change the configuration of the SCPI Manager. In this condition, any attempt to open the Launcher will generate an error message. If this happens, simply close the SCPI Manager and the Launcher and then reopen the Launcher.

Choosing the **Step** button permits the user to jump to a specific step as shown in the figure below.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

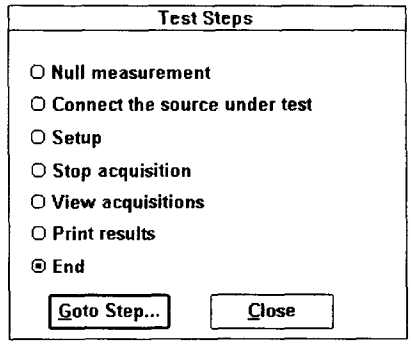


Figure 6-21. Test Steps Window

IMPORTANT

When using a Maestro application it is sometimes useful to view the individual module screens or the IQ-200 Optical Test System screen. To get back to the Launcher or to the Maestro Application you must use either the ALT-TAB keys or the Windows Task Manager (CTL-ESC). These are standard Windows features used for navigating from one open application to the next.

6.8 Printer Selection

When the IQ Software is installed in a standard Windows environment running on a PC with the IQ-206 PC Expansion Card, the printer selection procedure is the same as for any Windows compatible software (i.e. from Control Panel). However, when the IQ Software is installed on the IQ-203 Mainframe, the printer selection procedure is as follows:

1. From the IQ-200 Optical Test System screen, open the **Run** menu.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. Click on **Control Panel**.

3. Double-click on the **Printers** icon in order to open the Printers window.

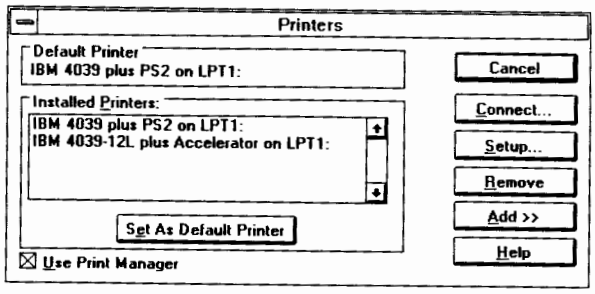


Figure 6-22. Printer Setup Window

4. If the printer is listed in the Installed Printers list box, simply highlight the desired printer and choose **Set As Default Printer**.

5. If the printer is not listed in the **Installed Printers** list box

   5 a. Choose the **Add** button to open a list of available printers.

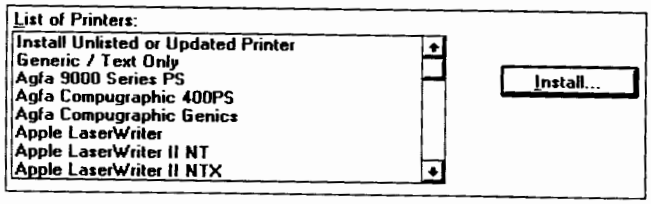


Figure 6-23. List of Available Printers

   5 b. Highlight the desired printer.

   5 c. Choose **Install...**, the system may request that a floppy disk be installed

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

as shown below.

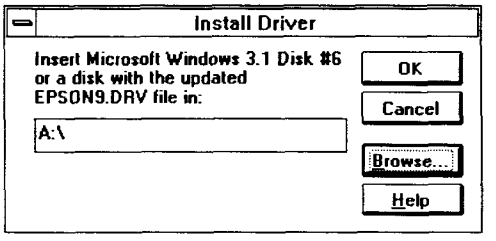


Figure 6-24. Driver Installation

5 d. Type **C:\windows\disk6** in the edit box.

5 e. Choose OK.

***Note**: All printer drivers are pre-installed on the IQ-203 hard disk in the **C:\windows\disk6** directory.*

6. Choose Set As Default Printer.

6.9 Module Main Windows

A module main window contains all module operation commands. The main windows differ according to the IQ series modules. Refer to each IQ series module instruction manual for further information.

To open any IQ series module main window

1. Double-click on the desired module icon along the bottom of the IQ-200 Optical Test System window (see Figure 6-11), or push the LED push-button on the front of the module.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. After a brief delay, the module main window appears on the screen.

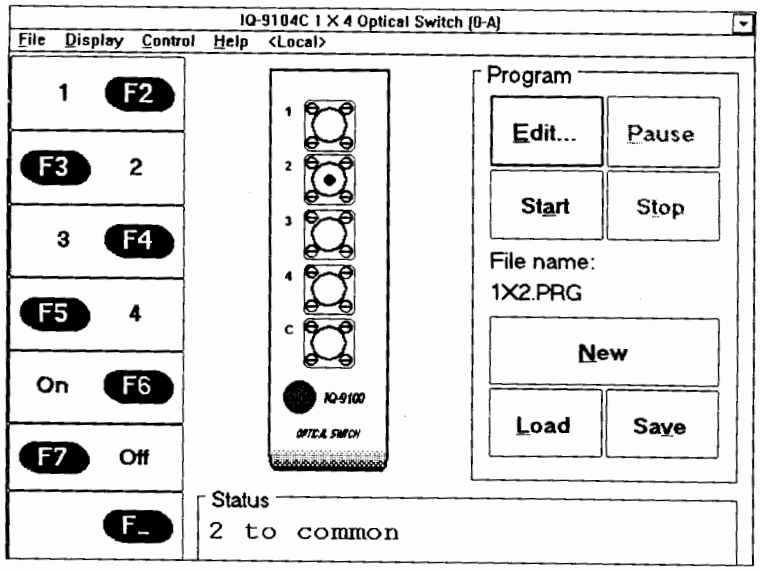


Figure 6-25. Main Window Example (IQ-9100 Optical Switch)

3. Refer to the module instruction manual for further information on main window operation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.10 IQ-200 Module Monitor Windows

A module monitor window is a smaller display window containing primary operation information for quick reference. Since the monitor window is smaller, it is ideal for use in tile format and allows viewing up to 27 monitor windows simultaneously. As example, the figure below shows the IQ-9100 Optical Switch monitor window.

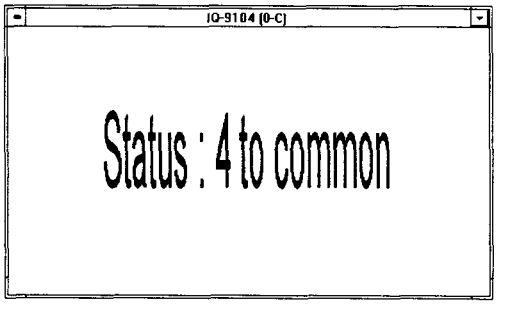


Figure 6-26. Monitor Window Example (IQ-9100 Optical Switch)

6.10.1 Opening the Monitor Window

There are three ways to open any IQ series module monitor window:

- In the main window, choose Monitor from the Display menu.
- In the main window, click on ▾ (in the upper right corner of the main window).
- Push the LED push button (on the front panel of the switch module).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

You can click the right mouse key on the required monitor window to access the application function button keypad as shown in Figure 6-27. Clicking any mouse button outside the function button keypad will close the function button keypad.

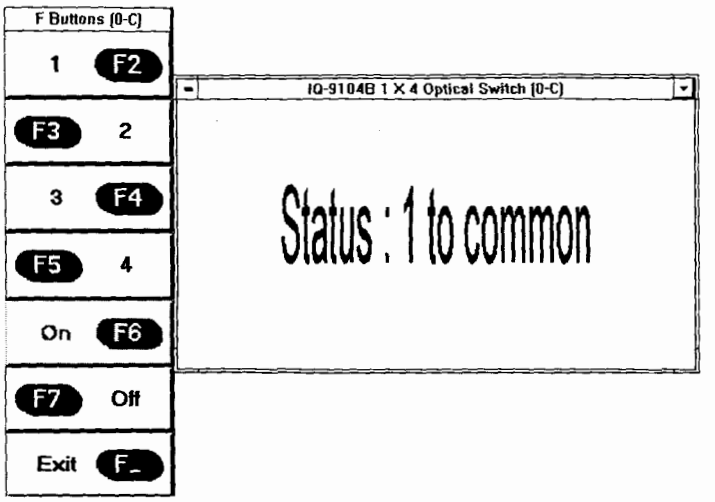


Figure 6-27. Monitor Window with Function Buttons

6.10.2 Closing the Monitor Window

There are two ways to close the monitor window and return to the IQ series module main window:

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

***Note**: Refer to the specific module instruction manual for any further information on module monitor window.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.11 Exiting the IQ Software

To exit the IQ Software

1. In the IQ-200 Optical Test System window, choose Exit from the File menu.

2. An information window will appear indicating a subsequent deactivation of all module applications.

3. Choose [OK] to close all IQ module applications.

4. A second information window will then appear asking whether or not to save the current configuration as default before exiting. The configuration saved upon exit will be used at the next IQ Software startup.

***Note**: After exiting, the IQ-203 returns to the DOS prompt C:\>. To return to the IQ Optical Test System, type WIN.*

6.12 Powering Off the IQ-203 Mainframe

As for any computer, it is recommended to exit all software (IQ Software, Windows, etc.) before powering off the IQ-203 Mainframe. To power off the IQ-203 Mainframe, once in DOS, simply push the power button, in the bottom left corner of the unit.

6.13 Powering Off the IQ-206 Expansion Unit

It is very important to exit the IQ Software (according to the above procedure) before powering off the IQ-206 Expansion Unit. To power off the IQ-206 Expansion Unit, once the IQ Software is exited, simply push the power button, in the lower left corner of the unit.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7 MAINTENANCE

7.1 Maintenance of the IQ-203 Mainframe

The IQ-203 Mainframe has been designed to require a minimum of maintenance and to provide reliable operation for many years. The IQ-203 has the same characteristics as a computer, therefore, similar care should be taken.

7.1.1 File Defragmentation

Over time, as applications read, write, and delete files, information stored on the IQ-203 Mainframe hard disk may become fragmented. Basically, fragmented files are longer to access and read than unfragmented files. In order to reorganize the files on the disk and thus optimize disk performance, it is recommended to perform the DOS command DEFRAG at least once a week.

To perform a full optimisation defragmentation, exit from the IQ Software then, at the DOS prompt, type «DEFRAG C:/F».

For more information on the DEFRAG command, refer to a DOS instruction manual or to the online help.

7.1.2 Microsoft ScanDisk

Microsoft ScanDisk is a DOS program used to detect errors on a drive. Once found, the erroneous files are fixed and saved in the drive's root directory, under the name «FILE0000.CHK», «FILE0001.CHK», «FILE0002.CHK», etc.

On the IQ-203 Mainframe, the ScanDisk is called from the AUTOEXEC.BAT file and is thus executed each time the IQ-203 is turned on. It is recommended to verify the «.CHK» files from time to time and to delete the needless ones in order to free disk space.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Every time a ScanDisk is performed, the results of the disk analysis are stored in the SCANDISK.LOG file. The SCANDISK.LOG is used to identify any erroneous file detected at startup. It is recommended to occasionally delete this file in order to prevent it from wasting disk space.

For more information on the ScanDisk command, refer to a DOS instruction manual or to the SCANDISK.INI file, which contains settings used to customize the ScanDisk program.

7.1.3 Fuse Replacement

The IQ-203 contains two 250 V, 3 A (.197" x .787"/5 x 20 mm) fast blow fuses. The fuse holder is located on the IQ-203 back panel, just beside the power inlet (refer to Figure 2-2).

To replace the fuses

1. Unplug the power cord from the IQ-203.
2. Pull the fuse holder out of the IQ-203.

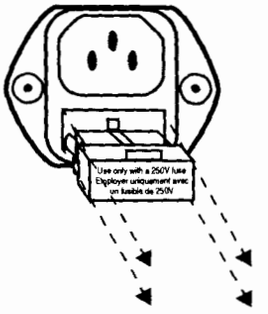


Figure 7-1. Pulling out the Fuse Holder

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3. Verify and replace the fuses if necessary.

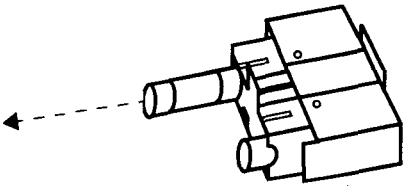


Figure 7-2. Replacing the Fuses

4. Make sure the fuses are firmly in the holder prior to reinsertion.

5. Firmly push the holder back into place.

7.1.4 Environmental Conditions

It is recommended to operate and store the unit in a dust free environment. Put the unit back into its shipping material if you need to transport it.

In order to prevent dirt and dust from entering the module housing, replace the protective cover plate when a slot is not in use.

7.1.5 Cleaning the IQ-203 Mainframe

To help ensure long, trouble-free operation

- keep the IQ-203 Mainframe free of dust,
- be careful not to spill liquids into the unit. If the unit does get wet, turn the power off immediately and let the unit dry completely before turning it on again,
- clean the IQ-203 Mainframe with a slightly damp (with water) cloth.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7.2 Maintenance of the IQ-206 Expansion Unit

The IQ-206 Expansion Unit has been designed to require a minimum of maintenance and to provide accurate operation for many years.

7.2.1 Fuse Replacement

The IQ-206 Expansion Unit contains two 250 V, 3 A (.197" x .787"/5 x 20 mm) fast blow fuses. The fuse holder is located on the IQ-206 back panel, just below the power inlet (refer to Figure 3-2).

To replace the fuses

1. Unplug the power cord from the IQ-206 Expansion Unit.

2. Pull the fuse holder out of the IQ-206 Expansion Unit.

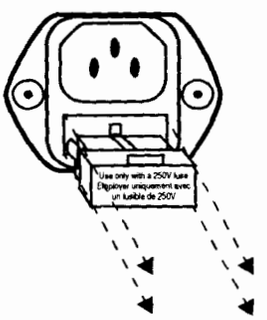


Figure 7-3. Pulling out the Fuse Holder

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3. Verify and replace the fuses if necessary.

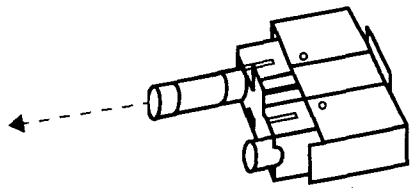


Figure 7-4. Replacing the Fuses

4. Make sure the fuses are firmly in the holder prior to reinsertion.

5. Firmly push the holder back into place.

7.2.2 Environmental conditions

It is recommended to operate and store the unit in a dust free environment. Put the unit back into its shipping material if you need to transport it.

In order to prevent dirt and dust from entering the module housing, replace protective cover plate when a slot is not in use.

7.2.3 Cleaning the IQ-206 Expansion Unit

To help ensure long, trouble-free operation

- keep the IQ-206 Expansion Unit free of dust,
- be careful not to spill liquids into the unit. If the unit does get wet, turn the power off immediately and let the unit dry completely before turning it on again,
- clean the IQ-206 Expansion Unit with a slightly damp (with water) cloth.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7.3 Maintenance of the IQ-206 PC Expansion Card

The IQ-206 PC Expansion Card has been designed to require a minimum of maintenance and to provide reliable operation for many years.

7.3.1 Electrostatic Discharge Precautions

Electrostatic discharge (ESD) precautions must be taken at all times while handling the IQ-206 PC Expansion Card. Always work at an approved ESD work station or use an ESD ground strap when handling the IQ-206 PC Expansion Card.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

8 TROUBLESHOOTING

Should any failure occur during operation of the IQ-200 Optical Test System, consult the troubleshooting tables below. If no solution is found, then call EXFO for assistance at 1-800-663-3936 or 1-418-683-0211.

8.1 IQ-203 Mainframe

Problem	Probable Cause	Recommended Action
IQ-203 does not power ON	AC power not applied	Verify AC power cord connection, then power on IQ-203
	Fuse blown	Verify the fuses (see Section 7.1.3)
Blank LCD/CRT display	LCD/CRT display not activated	Press the (IQ) front panel key, or select an LCD/ CRT display in Display menu when LCD/CRT lights up
	External display not on	Turn on external display
Panel keys, mouse, and/or keyboard do not respond	No communication between keys/mouse/ keyboard and computer	Power OFF IQ-203 and IQ-206 Expansion Units and secure IQ modules in place as well as verify mouse, keyboard, and all cable connections, then power on IQ-203

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

8.2 IQ-206 Expansion Unit

Problem	Probable Cause	Recommended Action
IQ-206 Expansion Unit does not power ON	AC Power not applied	Verify AC power cord connection, then power on IQ-206
	Fuse blown	Verify the fuses (see Section 7.2.1)
IQ-206 Expansion Unit sequential position display indicates "E"	IQ-206 Expansion Unit not connected to IQ-203 or IQ-206PC	Power OFF IQ-203 and IQ-206; properly connect interface cable; then power on IQ-206, followed by IQ-203

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

8.3 IQ-206 PC Expansion Card

Problem	Probable Cause	Recommended Action
IQ Software does not detect IQ modules installed in an IQ-206 Expansion Unit	Either: • the IQ-206 Expansion Unit is not powered on, or • the modules are not properly inserted into their slot, or • the IQ interface cable is not properly connected, or • the card is not properly connected, or • the IQ-206 PC Expansion Card conflicts with another card installed in the computer	1. Power off the unit running the IQ Software 2. Power off the IQ-206 Expansion Unit 3. Make sure the modules are properly inserted into their slots 4. Make sure the IQ interface cable is properly connected 5. Make sure the card is properly installed according to Section 4.5 6. Make sure other cards installed in the computer do not conflict with the IQ-206 PC Expansion Card (I/O ports address and IRQ are given in Section 4.4) 7. Power on the IQ-206 Expansion Unit 8. Load the IQ Software
IQ-206 PC Expansion Card host computer does not boot	IQ-206 PC Expansion Card is not properly installed	Remove the card from the host computer, clean the edge connectors of the card, then reinstall the card as described in Section 4.5.
	Address conflict	Verify that other cards installed in the computer do not conflict with the IQ-206 PC Expansion Card (IO ports address and IRQ are given in Section 4.4).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

9 IQ SERIES MODULES AND APPLICATIONS

9.1 IQ Series Modules

The following table lists the IQ modules that are now available.

IQ Module	Description
IQ-1100	Single Channel Power Meter
IQ-1200	4-Channel Power Meter
IQ-1500	Calibration Power Meter
IQ-2100	Light Source (LED, laser, DFB)
IQ-3100	Variable Attenuator
IQ-3200	Return Loss Meter
IQ-3300	Variable Reflector
IQ-9100	Optical Switch
IQ-9600	Utility Module

Please contact EXFO for further details.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

9.2 Application Matrix

Below are various test applications and the respective necessary modules.

Test \ IQ Module	1100	1200	1500	2100	3100	3200	3300	9100
Automated Environmental Components/Fiber Testing:								
1) Attenuation	√	√		√				√
2) Reflection				√		√	√	√
3) Insertion Loss	√	√		√				√
4) Isolation	√	√		√				√
5) Cross Talk	√	√		√				√
System Testing:								
1) Bit Error Rate	√			√	√			
2) Network Failure		√			√		√	√
Monitoring/Signal Processing:								
1) Amplified Signal		√		√				
2) Network Failure		√			√		√	√
Instrument Calibration:								
1) Power Meter Calibration								
– *Linearity Verification*	√			√	√			
– *Correction Constant*	√		√	√				
2) Light Source Certification								
– *Source Stability*	√	√					√	
– *Source Power Output*	√	√						
3) Attenuator Certification								
– *Attenuator Linearity*	√	√		√				
– *Attenuator Insertion Loss*	√	√		√				
4) Return Loss Meter Certification								
– *ORL Meter Linearity*				√			√	
– *ORL Meter Accuracy*	√		√	√				
– *ORL Meter Insertion Loss*	√			√				

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

9.3 IQ-9600 Utility Module

The IQ-9600 Utility Module is an empty IQ series module casing. EXFO offers this module casing, along with fixing material, for IQ users who wish to install passive optical components into their measurement setup. The IQ-9600 Utility Module comes in either single-slot size (IQ-9601) or double-slot size (IQ-9602). The amount of material supplied with the utility module depends on the configuration.

The IQ-9600 Utility Module is supplied with

- Adhesive tape for tie wrap
- Large adhesive (gray)
- Adhesive tape for fiber
- Tie-wrap
- Tie-wrap with ring
- Splice holder
- Double sided adhesive tape

The following optional items are also offered:

- No connector hole on the module front panel
- Pigtail connector
- ST connector
- SC connector
- FC connector
- FC–APC connector

The following exploded views can be used as a reference for disassembling and reassembling the utility modules.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

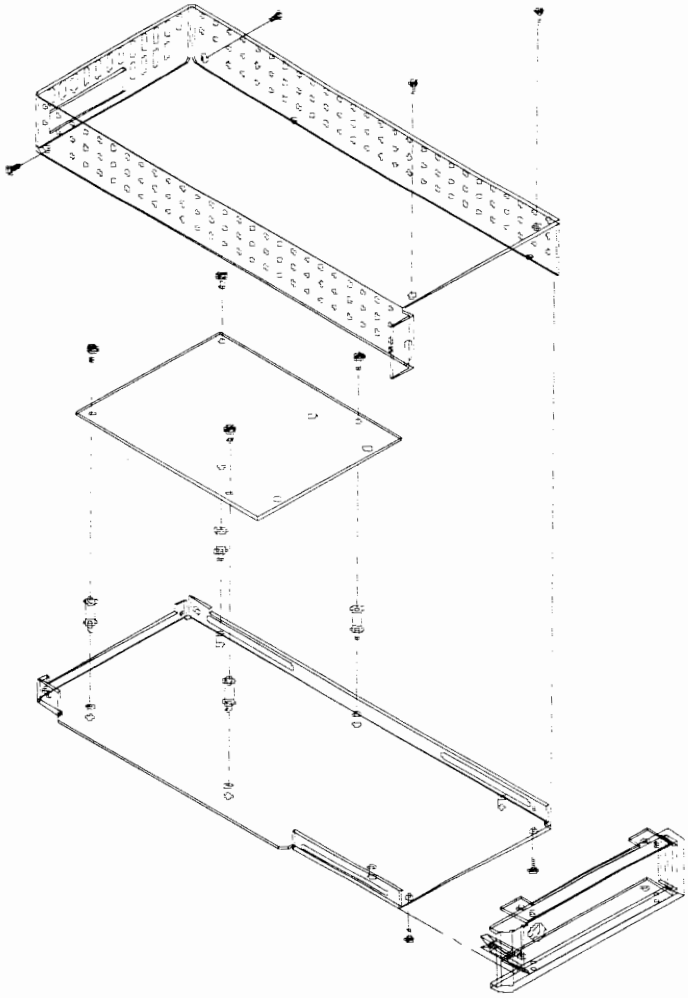


Figure 9-1. Exploded View of the IQ-9601 Utility Module

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

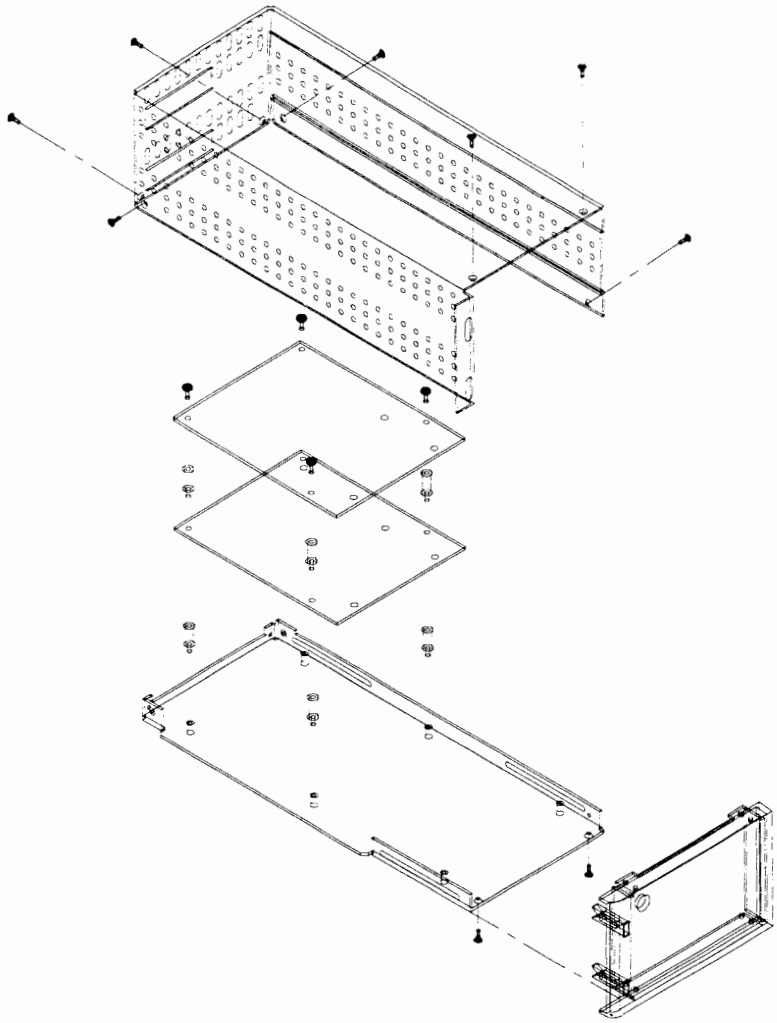


Figure 9-2. Exploded View of the IQ-9602 Utility Module

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

10 TECHNICAL SPECIFICATIONS

10.1 IQ-203 Mainframe

Computer Specifications	
Hard disk	550 MB
RAM	8 MB
CPU	486DX-75

Electrical Specifications	
Maximum input current	1.5 A at 120/240 VAC (50/60 Hz)
Fuses	250 V, 3 A fast blow

Mechanical Specifications	
Slots	3
Dimensions	Width: 14.25"/36 cm
	Height: 5.75"/14.5 cm
	Length: 12"/30.5 cm
LCD (VGA) Monitor	Width: 5"/12.5 cm
	Height: 3.5"/9 cm
Weight	11.7 lb/5.3 kg

Environmental Specifications	
Operating	32 to 122 °F/0 to +50 °C (80% non-condensing relative humidity
Storage	-4 to 140 °F/-20 to +60 °C (80% non-condensing relative humidity
Maximum altitude	6000 ft./2000 m
Pollution Degree	2
Installation Category	II

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

10.2 IQ-206 Expansion Unit

Electrical Specifications	
Maximum input current	3.0 A at 120 VAC (50/60 Hz)
	2.0 A at 240 VAC (50/60 Hz)
Fuses	250 V, 3 A fast blow

Mechanical Specifications	
Slots	6
Dimensions	Width: 14.25"/36 cm
	Height: 5.75"/14.5 cm
	Length: 12"/30.5 cm
Weight	7.7 lb/3.5 kg

Environmental Specifications	
Operating	32 to 122 °F/0 to +50 °C (95% non-condensing relative humidity
Storage	-40 to 158 °F/-40 to +70 °C (95% non-condensing relative humidity
Maximum altitude	6000 ft./2000 m
Pollution Degree	2
Installation Category	II

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

10.3 IQ-206 PC Expansion Card

Electrical Specifications	
Power	5 VDC <200 mA

Mechanical Specifications	
Dimensions	Length: 6.5"/16.4 cm
	Height: 4.8"/12.2 cm
	Thickness: 0.8"/2.0 cm

Environment Specifications	
Operating temperature	32 to 131 °F/0 to +55 °C (95% non-condensing relative humidity
Storage temperature	-4 to 140 °F/-20 to +60 °C (95% non-condensing relative humidity

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

11 WARRANTY

11.1 General Information

EXFO E.O. Engineering (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 Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

11.2 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.

11.3 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.

11.4 Certification

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

11.5 Software License Agreement

IMPORTANT

Read carefully before using the IQ-200 Optical Test System which contains Microsoft Windows software.

This software license agreement including the Warranty and Special Provisions set forth in Section 11.6, is a legal agreement between you (either an individual or an entity, hereinafter "End User") and the manufacturer (EXFO Electro-Optical Engineering Inc.) of the IQ-200 Optical Test System containing the

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

software product. By using the IQ-200 Optical Test System on which software program(s) have been preinstalled (Microsoft Windows) you are agreeing to be bound by the terms of this agreement.

1. GRANT OF LICENSE. This License Agreement permits you to use the Microsoft Windows software as preinstalled on the embedded system.

2. INTELLECTUAL PROPERTY. The IQ-200 Optical Test System contains intellectual property, i.e.software programs, that is licensed for the End User. This is not a sale of such intellectual property. The End User shall not copy, disassemble, reverse engineer, or decompile the Microsoft Windows software.

3. COPYRIGHT. The Microsoft Windows software is owned by Microsoft Corporation or its suppliers and is protected by United Stated copyright laws and international treaty provisions and all other applicable national laws. Therefore, you must treat the Microsoft Windows software like any other copyrighted material (e.g. a book or musical recording).

4. U.S. GOVERNMENT RESTRICTED RIGHTS. The Microsoft Windows software and documentation are provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by the United Stated Government is subject to restrictions as set forth in subparagraph (c)(1)(n) of The Rights in Technical Data and Computer Software clause at DFARD 252.227-7013 or subparagraphs (c)(1) and (2) of the Commercial Computer Software-Restricted Rights at 48 CFR 52. 227-19, as applicable. Manufacturer is Microsoft Corporation/One Microsoft Way/Redmond, WA 98052-6399

Please see the Warranty and Special Provisions (Section 11.6) for information concerning governing law.

Product support for the Microsoft Windows software is not provided by Microsoft Corporation or is subsidiaries. For product support, please refer to EXFO's support number provided on page 1-7. Should you have any questions

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

concerning this Agreement, or if you desire to contact EXFO for any other reason, please refer to the address provided in the documentation for your IQ-200 Optical Test System.

FOR THE LIMITED WARRANTY AND SPECIAL PROVISIONS PERTAINING TO YOUR COUNTRY, PLEASE REFER TO EMBEDDED SYSTEM DOCUMENTATION OR THE WARRANTY AND SPECIAL PROVISIONS (Section 11.6).

11.6 Warranty and Special Provisions

11.6.1 Limited Warranty

LIMITED WARRANTY. EXFO Electro-Optical Engineering Inc. warrants that (a) the Microsoft Windows software will perform substantially in accordance with the accompanying written materials for a period ninety (90) days from the date of receipt. Any implied warranties on the Microsoft Windows software are limited to ninety (90) days. Some states/jurisdictions do not allow limitation on duration of an implied warranty, so the above limitation may not apply to you.

CUSTOMER REMEDIES. EXFO Electro Optical Engineering Inc. and its supplier's entire liability and your exclusive remedy shall be at EXFO's option, either (a) return of the price paid, or (b) repair or replacement of the Microsoft Windows software that does not meet the above Limited Warranty and which is returned to EXFO with a copy of you receipt. This Limited Warranty is void if failure of the Microsoft Windows software has resulted from accident, abuse, or misapplication. Any replacement software will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer.

THE MICROSOFT SOFTWARE PROGRAMS ARE PROVIDED TO THE END USER "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO,

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK OF THE QUALITY AND PERFORMANCE OF THE SOFTWARE PROGRAM IS WITH YOU.

EXFO AND ITS SUPPLIERS SHALL NOT BE HELD TO ANY LIABILITY FOR ANY DAMAGES SUFFERED OR INCURRED BY THE END USER (INCLUDING, BUT NOT LIMITED TO, GENERAL, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES INCLUDING DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION AND THE LIKE), ARISING FROM OR IN CONNECTION WITH THE DELIVERY, USE OR PERFORMANCE OF THE SOFTWARE PROGRAM.

11.6.2 Special Provisions

This Software License Agreement and Warranty are governed by the laws of the State of Washington, USA

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

11.7 Service and Repairs

To obtain service or repair for any equipment, follow the procedure below.

- Call EXFO Sales and Product Support Group at one of the numbers given in Section 1.5. Support personnel will determine if the equipment requires service, repair, or calibration.
- 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.
- 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).

- 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. However, shipping insurance is at the customer's expense.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

12 CUSTOMER COMMENTS

At EXFO, we are continuously looking for ways to improve our products. We would appreciate any comments or suggestions that you may have concerning the operation and service of the IQ Product Line. Please contact our Sales and Product Support Group at 1-800-663-EXFO (fax: 1-418-683-2170). When calling, please provide the following information:

1. Part Number: IQ_____ Serial Number: _____
2. Product/Software Version _____

   (see **About** IQ-203 window) _____
3. User Name: _____

   Company Name: _____

   Address: _____

   _____

   _____

   Telephone: _____ Fax: _____
4. Brief description of the product application. _____

   _____

   _____

   _____
5. Comments or description of problems (if any). _____

   _____

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page intentionally left blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

INDEX

Symbols

!

at the back of the IQ-203 1-4
at the back of the IQ-206 1-4

A

abbreviations xiii
AC requirements 1-4
application matrix 9-2
assistance 1-7
AT clock maximum 4-3

B

bench top setup 5-1
binary code 4-4
black screen 6-16
blank module 9-3
brightness buttons 2-3

C

CAUTION 1-2
CE certification xii
certification 11-2
Certification Information ..... x to xii
check boxes 6-4
choose 6-1
click 6-1
close all lights 6-16, 6-20
comments card 12-1
connecting IQ components 5-6
contacting EXFO 1-7
Control Panel 6-17
cooling the units 5-1
copyright ii
CPU 10-1
CRT 6-16
Custom application 6-26
customer comments 12-1

D

date of manufacture
IQ-203 2-5
IQ-206 Expansion Unit 3-4
DDE communication 5-12, 6-30
default configuration 6-37
DEFRAG command 7-1
defragmentation 7-1
DIP switches 4-3
disk space 6-17
displayed reading refresh rate 6-20
double-click 6-1
dragging 6-2

E

edit boxes 6-3
electrostatic discharge precautions 7-6
entering
alphanumeric values 6-9
numeric values 6-8
ESD 7-6
exclusions 11-2
EXFO telephone numbers 1-7

F

F.C.C. *see* Federal Communication Commission
Federal Communication Commission x
File Manager 6-17
floppy disk drive 2-3
front panel keys

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

connection with software buttons 6-6
disable 6-16, 6-20
enable 6-16
location 2-3
related functions 6-5
front panel mouse
location 2-3
front panel mouse. *see* mouse operation
function button keypad 6-36
fuse holder location
on the IQ-203 2-4
on the IQ-206 Expansion Unit 3-3
fuse replacement
on the IQ-203 Mainframe 7-2
on the IQ-206 Expansion Unit 7-4

G

getting started
with the IQ-203 Mainframe 6-10
with the IQ-206 PC Expansion Card 6-12
GPIB compatibility 5-11
GPIB link 6-18
GPIB port 2-4

H

hard disk drive LED 2-3
hard disk space 6-17, 10-1
hardware keyboard 6-7
HDD. *see* hard disk drive LED
hexadecimal address 4-4

I

I/O address 4-11
I/O port setting 4-4
IDs setting 6-20
IMPORTANT 1-2
IN 3-3
input/output port address 4-4
inserting a module 5-10
installation
of the IQ Software 4-6
of the IQ-206 PC Expansion Card 4-5
installing a module 5-10
interrupt number setting 4-5
IQ load 6-17
IQ Series modules
list 9-1
IQ Setting window 6-19
IQ Software
About window 6-17
configuration 4-9
default configuration 6-37
exiting the 6-37
icon 6-14
installation 4-6
loading 6-14
menu bar 6-16
see also IQ Setting
software load 6-17
version 6-17
window description 6-15
IQ Software conventions
check boxes 6-4
edit boxes 6-3
entering alphanumeric values 6-9
entering numeric values 6-8
front panel mouse operation 6-2
hardware keyboard operation 6-7
IQ-203 front panel keys 6-5
list boxes 6-4
mouse operation terminology 6-1
radio buttons 6-4
software buttons 6-3
IQ-12000 series applications 6-26
IQ-200 Optical Test System
as a GPIB Controller 5-12
as a GPIB Device 5-11
capacity 2-2

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

connecting 5-6
description 1-1
module insertion 5-10
module removal 5-11
IQ-200 product line 1-1
IQ-203
memory 6-17
IQ-203 Mainframe
back panel 2-4
cleaning 7-3
computer configuration 2-2
description 2-2
external monitor port 2-4
floppy disk drive 2-3
front panel 2-3
front panel mouse 2-3
fuse holder 2-4
getting started 6-10
GPIB port 2-4
inspection upon receipt 2-1
keyboard port 2-4
maintenance 7-1
memory 10-1
modem ports 2-4
mouse port 2-4
nameplate 2-5
optional items 2-1
power up 6-10
printer port 2-4
standard items 2-1
technical specifications 10-1
troubleshooting 8-1
IQ-206 Expansion Unit
back panel 3-3
cleaning 7-5
date of manufacture 3-4
description 3-1
front panel 3-2
fuse holder 3-3
inspection upon receipt 3-1
maintenance 7-4
nameplate 3-4
part number 3-4
sequential position display 3-2
serial number 3-4
standard items 3-1
technical specifications 10-2
troubleshooting 8-2
version number 3-4
IQ-206 PC Expansion Card
AT clock maximum 4-3
description 4-1
DIP switches 4-3
getting started 6-12
hardware settings 4-3
host computer configuration 4-2
I/O port setting 4-4
illustration 4-2
installation 4-5
IQ Software configuration 4-9
IQ Software installation 4-6
IRQ number setting 4-5
maintenance 7-6
power consumption 4-3
power up 6-12
removing IQ Software driver 4-11
requirements 4-2
standard items 4-1
technical specifications 10-3
troubleshooting 8-3
IQ-9600 Utility Module ..... 9-3 to 9-5
IRQ number 4-10
IRQ number setting 4-5

K

keyboard port 2-4
keyboard window 6-9
keypad window 6-8

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

L

laboratory testing xii
launcher 6-26
LCD 6-16
liability 11-2
license agreement 11-2
list boxes 6-4
loading the IQ Software 6-14
local 6-18
location 2-3
lockout 6-18

M

Maestro Application
  at startup 6-23
  custom 6-26
  general 6-26
  IQ-12000 series 6-26
  sample 6-26
  selecting modules 6-29
  starting 6-30
  startup command line 6-23
Maestro Sample Applications
  installation. *see* IQ Software installation
maintenance kit 4-9
memory
  available 6-17
  hard disk 10-1
  RAM 2-2
Microsoft. *see* Windows
modem card
  I/O base address 2-5
  IRQ number 2-5
  location 2-4
modem ports 2-4
module
  icon 6-21
  identification 6-22
  insertion 5-10
  list 9-1
  main window 6-33
  position 6-21
  removal 5-11
monitor port 2-4
monitor window 6-35
  closing the 6-36
  opening the 6-35
mouse
  operation
    choose 6-1
    click 6-1
    double-click 6-1
    dragging 6-2
    moving 6-2
    terminology 6-1
  port 2-4
  settings 6-20
  speed 6-20

N

nulling the warranty 11-1
numeric keypad 6-8

O

OUT 3-3

P

part number
  IQ-203 2-5
  IQ-206 Expansion Unit 3-4
plugs 1-5
positioning
  the power supply selector 1-4
  the units 5-1
power cable 1-5
power consumption
  of the IQ-206 PC Expansion Card 4-3
power plug 1-5

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

power requirements 1-4
power supply selector
positioning 1-4
precautions 1-3
printer port 2-4
printer selection 6-31
procedures
IQ Software installation 4-6
IQ-206 PC Expansion Card installation .. 4-5
Program Manager 6-17

R

rack mount kit 5-2
rack mount setup 5-2
radio buttons 6-4
RAM 10-1
refresh rate 6-20
remote 6-18
removing
a module 5-11
the IQ Software driver 4-11
repairs 11-6
reply card 12-1
requirements
for the IQ-206 PC Expansion Card 4-2
Return Merchandise Authorization 11-6
RMA 11-6

S

safety conventions
CAUTION 1-2
IMPORTANT 1-2
WARNING 1-2
safety precautions 1-3
Sales and Product Support Group 11-6
ScanDisk 6-11, 7-1
SCPI Manager 6-17, 6-30
selecting a printer 6-31
sequential position display 3-2
serial number
IQ-203 2-5
IQ-206 Expansion Unit 3-4
service 11-6
software
buttons 6-3
function button 6-6
keyboard window 6-9
keypad 6-8
license agreement 11-2
version 6-17
specifications. *see* technical specifications
step-by-step applications. *see* Maestro Application
storage space 6-17
storing the unit 1-6
support 1-7
symbols xiii
SYSTEM.INI 4-11

T

technical specifications
IQ-203 Mainframe 10-1
IQ-206 Expansion Unit 10-2
IQ-206 PC Expansion Card 10-3
technical support 1-7
telephone numbers 1-7
testing with IQ modules 9-2
time of warranty 11-1
transporting the units 1-6
troubleshooting ..... 8-1 to 8-3

U

utility module 9-3

V

version number

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

IQ-203 2-5
IQ-206 Expansion Unit 3-4
voiding the warranty 11-1

W

WARNING 1-2
warranty
certification 11-2
exclusions 11-2
general information 11-1
liability 11-2
nulling 11-1
period 11-1
repairs 11-6
service 11-6
software license agreement 11-2
voiding 11-1
Windows 3.1
Control Panel 6-17
File Manager 6-17
license agreement 11-2
Program Manager 6-17
Windows 95 4-2
Windows NT 4-2

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.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