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IQ-2100 Light Source

Instruction Manual

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Second Edition

Software Version 1.0

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1 INTRODUCTION

1.1 IQ-200 Product Line

EXFO E.O. Engineering Inc. (EXFO) is pleased to introduce the IQ-2100 Light Source module as part of the IQ-200 Integrated PC/WINDOWS™ modular test system family. The IQ-200 product line consists of the IQ-203 Optical Test System mainframe, the IQ-206 Expansion Unit, and the IQ Series modules such as the IQ-2100 Light Source.

Refer to the IQ-203 and IQ-206 instruction manuals for specific operating instructions on these products.

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

1. Simple operation.
2. Extensive features.
3. Reliable performance.
4. Dedicated interest in customer needs.

The IQ-2100 Light Source will provide many years of reliable operation. In order to benefit fully from the many features offered by the IQ-2100, it is important to read the contents of this instruction manual carefully.

1.2 List of Abbreviations

The following abbreviations are used throughout this manual:

λ	wavelength
CFR	Code of Federal Regulations
dB	decibel
dBm	decibel referenced to a milliwatt ($10\log_{10}$ power in milliwatts)
FOA	Fiber-Optic Adapter
Hz	hertz
kHz	kilohertz
LED	Light Emitting Diode
NIST	U.S. National Institute of Standards and Technology
nm	nanometer (1.0×10^{-9} meter)
RAM	Random Access Memory
TE	Thermo Electric

1.3 Unpacking and Inspection

The IQ-2100 is delivered with the following standard items:

- IQ-2100 Light Source Module
- IQ-2100 Instruction Manual
- Back-up floppy disk
- Accessory kit (optional)

The IQ-2100 Light Source has been thoroughly inspected before shipment. If any damage has occurred during transportation or if any item is missing, please notify EXFO immediately.

1.4 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.

1.5 Safety Information

The IQ-2100 Light Source is a single- or dual-wavelength LED or laser source. The lasers are semiconductor diode lasers classified as 21 CFR Class I laser products that comply with 21 CFR 1040.10 and 1040.11. Laser radiation may be encountered at the source port.

The level of radiation is below that known to cause eye injury through accidental short term exposure. However, avoid prolonged exposure to light emitted from the fiber and do not stare directly at a light beam, visible or not.

WARNING

Performing procedures other than those specified herein may result in hazardous radiation exposure.

1.6 Getting Help

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

Product Support Group

- USA and Canada
  Tel.: 1-800-663-EXFO
  Fax: 1-418-683-2170

- International
  Tel.: 418-683-0211
  Fax: 418-683-2170

E-Mail Address: exfo@riq.qc.ca

EXFO Europe

Tel.: 33-1-34.63.00.20
Fax: 33-1-34.65.90.93

E-Mail Address: exfoeur@ibm.net

2 PRODUCT OVERVIEW

2.1 Description of the IQ-2100

The IQ-2100 Light Source module is a fiber-optic light source designed for laboratory and industry applications using the IQ-203 Optical Test System mainframe (or IQ-206 Expansion Unit).

The IQ-2100 Light Source is controlled using the software already installed on the IQ-203.

The product nameplate, shown in Figure 2-1, is located on a side panel near the rear of the module. The nameplate provides:

- the detailed part number (**P/N**) identifying connector type and configuration
- the serial number (**S/N**)
- the date of manufacture (**Mfg. date**)
- the product version (**Ver.**)

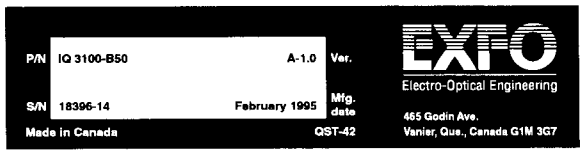


Figure 2-1. Module Nameplate

Description of the IQ-2100

The IQ-2100 Light Source comes in two different emitter types and various wavelengths. Table 2-1 summarizes the different light source configurations available with the IQ-2100 Series.

Model	Wavelength (nm)	Emitter Type
IQ-2101	850	LED
IQ-2102	1300 or 1310	LED or TE Cooled Laser
IQ-2112	850/1300	Dual LED
IQ-2103	1550	TE Cooled Laser
IQ-2123	1310/1550	Dual TE Cooled Laser

Table 2-1. IQ-2100 Series Wavelength and Emitter Type Configurations

2.2 Front Panel Description

Figure 2-2 illustrates the front panel of the IQ-2100 Light Source module.

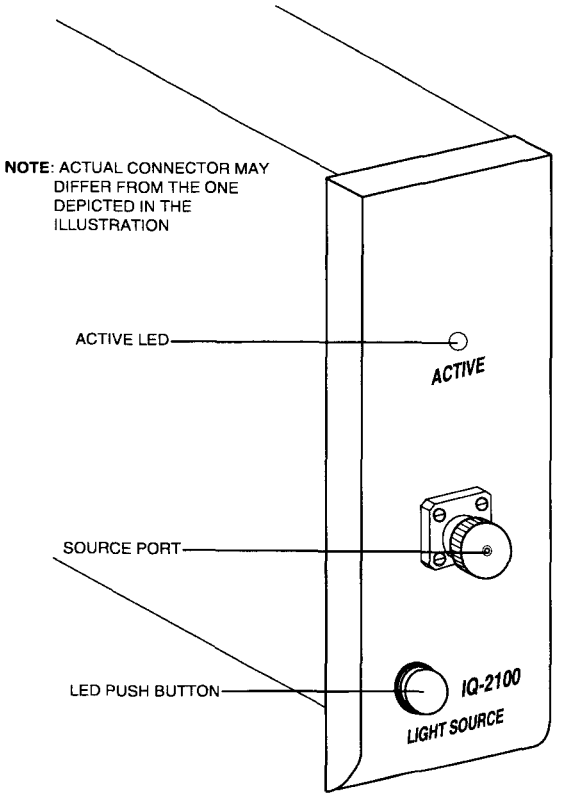


Figure 2-2. IQ-2100 Light Source Module

2.2.1 Active LED

When lit, the Active LED on the front panel indicates that light is being emitted from the source port.

2.2.2 Source Port

The source port on the front panel is used to connect the fiber.

2.2.3 LED Push Button

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

- When the IQ-203 is powered ON, the LED will illuminate.
- Pressing the LED push button activates the IQ-2100 Main window.
- Pressing the LED push button when the IQ-2100 Main window is open activates the IQ-2100 Monitor window.

Note: *The monitor window is a compact window displaying basic data. The monitor window is fully explained on page 5-4.*

3 MODULE SETUP

3.1 Module Installation

CAUTION

NEVER INSERT OR REMOVE ANY MODULE WHEN THE IQ-203/ IQ-206 MAINFRAME/EXPANSION UNIT IS POWERED ON. THIS WILL RESULT IN IMMEDIATE IRREPARABLE DAMAGE TO THE MODULE AND THE IQ-203/IQ-206.

To install the module:

1. Power 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.

IMPORTANT

Be sure to insert the module all the way to the back of the IQ-203/IQ-206 so as 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.

3.2 Optical Connections

IMPORTANT

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

The fiber-optic cable end should be cleaned at all times to ensure maximum output power.

To clean the fiber end:

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

To connect the fiber-optic cable to the port:

1. Only use dry connector.
2. Align the connector and port to avoid the fiber end touching the outside of the port or rubbing against other surfaces.
3. Do not overtighten.

3.3 Module Removal

CAUTION

NEVER INSERT OR REMOVE ANY MODULE WHEN THE IQ-203/ IQ-206 IS POWERED ON. THIS WILL RESULT IN IMMEDIATE IRREPARABLE DAMAGE TO THE MODULE AND THE IQ-203/IQ-206.

To remove the module:

1. Power OFF the IQ-203/IQ-206.
2. Place fingers under the bottom groove (Figure 3-1) of the module front panel and firmly pull module outward.

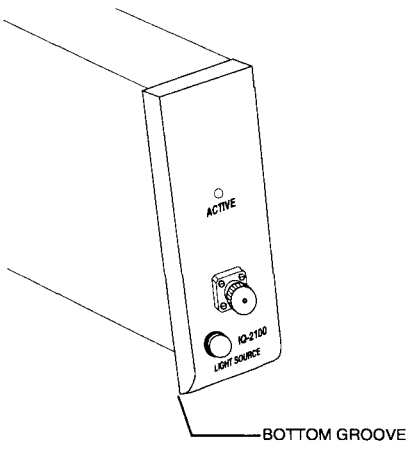


Figure 3-1. IQ-2100 Bottom Groove

4 SOFTWARE CONVENTIONS

4.1 Mouse Operation

"Click," "Choose," and **"Double Click"** are used throughout this manual 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 (see IQ-203 instruction manual) or keyboard, the user shall press once on the left mouse key to begin the specific operation related to the object.

- **"Choose"** signifies that, after placing the cursor on the desired software button using the mouse or keyboard, the user shall press once on the left mouse key to begin the specific operation related to the button.

- **"Double-click"** signifies that, after placing the cursor on the desired object using the mouse or keyboard, the user shall press twice on the left mouse key to begin the specific operation related to the object.

4.2 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 4-1 illustrates two typical software buttons.

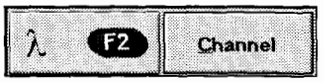


Figure 4-1. Software Buttons

Edit Boxes

An edit box is a data display and entry box that contains a value that may be modified by the user. Figure 4-2 illustrates a typical edit box.

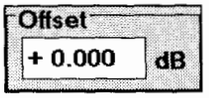


Figure 4-2. Edit Box

List Box

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 4-3 illustrates a list box.

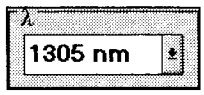


Figure 4-3. List Box

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 any time. Figure 4-4 illustrates a typical example where three possible options are available.

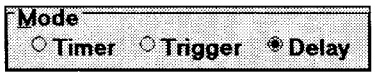


Figure 4-4. Radio Buttons

Check Boxes

Check boxes offer the possibility of selecting multiple options at once. Figure 4-5 illustrates an example of a check box.

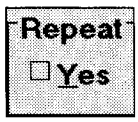


Figure 4-5. Check Box

4.3 Front Panel Hardware Key Operation

The IQ-203 front panel hardware keys (described in IQ-203 instruction manual) can be used to operate the software items. F must be pressed so that F buttons are in HARDWARE FUNCTION MODE (F BUTTONS GRAYED OUT on screen).

To choose a software button:

1. Press → until the desired button is highlighted.
2. Press ↵ to press the button.

To change the value inside an edit box:

1. Press → until the cursor is in the desired edit box.
2. Enter the new value using the **KEYPAD** window (see section 4.5).
3. Press ↵ to confirm the value.

To select a list box value:

1. Press → until the desired list box is highlighted.
2. Use the ↑ or ↓ key to highlight a new value from the list.

To select a radio button:

1. Press  until the desired radio button box is highlighted.
2. Using the  or  key, select the new radio button.

To select a check box option:

1. Press  until the desired check box is highlighted.
2. Press  to select the option.

4.4 Optional Hardware Keyboard Operation

The 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.

To select a check box option:

1. Press < TAB> until the desired check box is highlighted.
2. Press <SPACE BAR> to select the option.

4.5 Entering Numeric Values

To enter a numeric value into any edit box:

1. Double-click the edit box, using the **right** mouse key, to open the **KEYPAD** window shown in Figure 4-6.

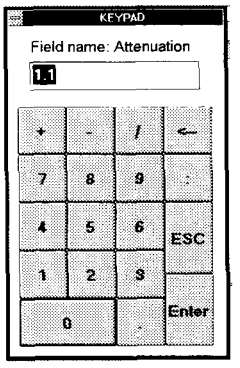


Figure 4-6. Keypad Window

2. Choose the appropriate buttons corresponding to the desired value.
   - Enter a positive or negative value using the [+] or [-] keys.
   - Choose [←] to erase a digit.
   - Choose [:] to enter time indications.
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.*

4.6 Entering Alphanumeric Values

To enter an alphanumeric value into a dialog box (without a hardware keyboard):

1. Using the **right** mouse key, double-click on **File Name** box in the dialog box. A **Software Keyboard** window will appear (Figure 4-7).

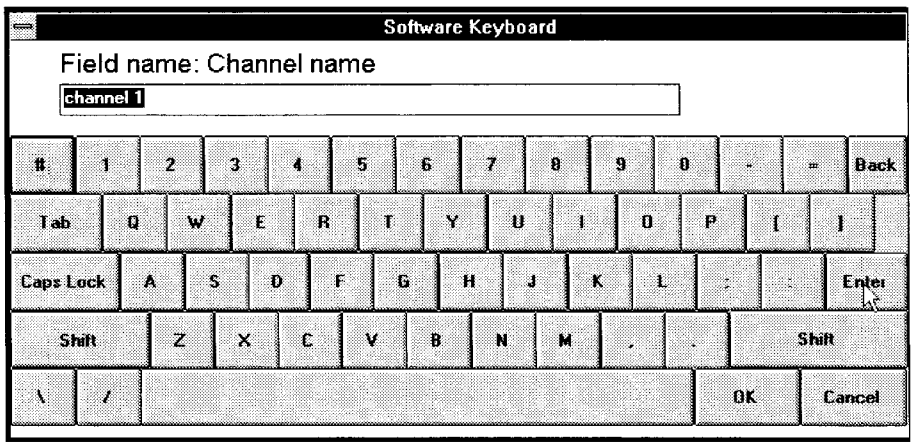


Figure 4-7. Software Keyboard

2. Type in the text.
   - The **Back** button is used to erase a character.

3. Choose **Enter** or **OK** to confirm the selection and return to the previous window.

*Note: To leave the **Software Keyboard** window without updating the edit box, choose **Cancel**.*

5 OPERATION

The many features of the IQ-2100 Light Source are controlled using the IQ-203 WINDOWS compatible software already installed on the IQ-203. Please refer to the IQ-203 Instruction Manual for information regarding the IQ-203 operating system and front panel description.

5.1 IQ-2100 Main Window Activation

In order to operate or control the light source, the IQ-2100 Main window must be open.

To open the IQ-2100 Main window:

- Push the LED push button on the IQ-2100 front panel,

  or;

- Double-click on the IQ-2100 icon in the IQ-203 Optical Test System Main window,

  or;

- Use <TAB> to choose the IQ-2100 icon in the IQ-203 Optical Test System main window and press <ENTER> to open the IQ-2100 Main window.

Activating the window loads the IQ-2100 application software.

Note: *Pushing the IQ-2100 LED push button does not activate the source.*

The IQ-2100 Main window will then appear on the screen, as illustrated in Figure 5-1.

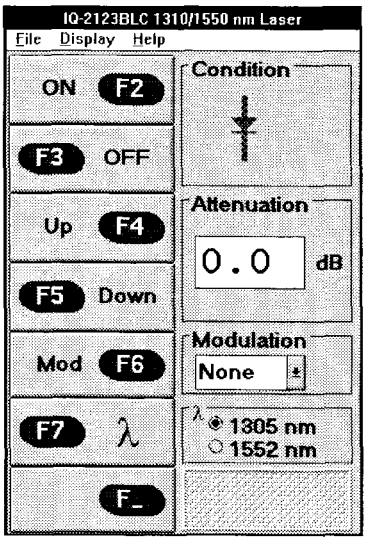


Figure 5-1. IQ-2100 Main Window

5.2 IQ-2100 Main Window Description

The IQ-2100 Main window shown in Figure 5-1 can be broken down into three sections:

- Title Bar, Control Menu Box, and Menu Bar
- Function buttons
- Data and Status display

5.2.1 Title Bar and Menu Bar

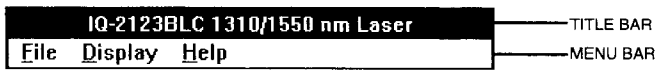


Figure 5-2. IQ-2100 - Title Bar and Menu Bar

Title Bar:

The IQ-2100 title bar shown in Figure 5-2 indicates the wavelength, LED/Laser specifications, and operating conditions.

Menu Bar:

The menu bar shown in Figure 5-2 contains three pull down menus:

- **File**
- **Display**
- **Help**

File:

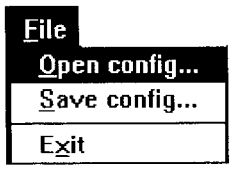


Figure 5-3. File Menu

- Select **Open Config...** to reset the IQ-2100 to a previously saved configuration.
- Select **Save Config...** to save the current IQ-2100 configuration.
- Select **Exit** to close the IQ-2100 application.

Display:



Figure 5-4. Display Menu

- Select **Monitor,** or push the LED push button, to switch to the source monitor window displaying the source status, wavelength and attenuation information as shown in Figure 5-5. Using the monitor window in conjunction with other module monitor windows allows to create an integrated data display screen (refer to IQ-203 manual). The size and position of the monitor window can be customized.

To return to the IQ-2100 Main window, double-click anywhere in the monitor window or push the IQ-2100 push button.

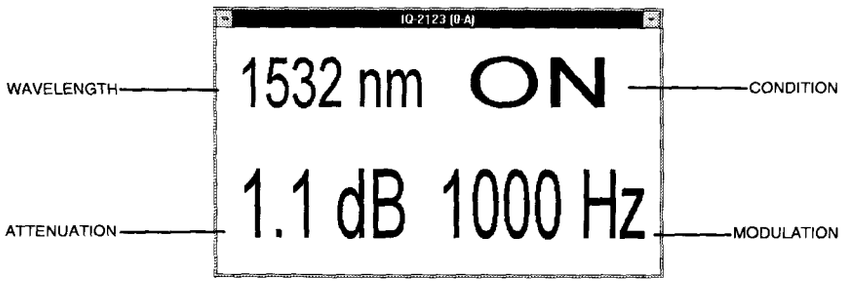


Figure 5-5. IQ-2100 Monitor Window

Note: *IQ-2100 function buttons can be accessed while in monitor window mode by positioning the cursor inside the monitor window and clicking the right mouse key. The function button keypad will appear to the left of the monitor window.*

Help:



Figure 5-6. Help Menu

- Select **Contents...** to open the IQ-2100 application Help file.

* Text of this instruction manual is included in the IQ-2100 on-line Help file.

- Select **About...** to view the information window shown in Figure 5-7, where the following information is provided:

1. Software version.
2. Technical assistance telephone numbers.
3. Available IQ-203 system memory (includes RAM plus virtual memory).
4. Remaining hard disk drive storage space.
5. 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 difficulty.



Figure 5-7. About Source Window

- Choose the OK button to return to IQ-2100 Main window.

5.2.2 Function Buttons

The function buttons, located on the left side of the IQ-2100 Main window, are used for direct control of the IQ-2100 Light Source. Table 5-1 provides a quick reference guide to these controls.

FUNCTION BUTTON	DESCRIPTION
ON F2	ON button: • Activates the light emission (refer to Section 5.4.4, *Emission Activation/Deactivation*).
F3 OFF	OFF button: • Deactivates the light emission (refer to Section 5.4.4, *Emission Activation/Deactivation*).
Up F4	Increase button: • Increases the attenuation (refer to Section 5.4.2, *Attenuation Setting*).
F5 Down	Decrease button: • Decreases the attenuation (refer to Section 5.4.2, *Attenuation Setting*).
Mod F6	Modulation button: • Selects the modulation (refer to Section 5.4.3, *Modulation Selection*).
F7 λ	λ button: • Selects the wavelength (refer to Section 5.4.1, *Wavelength Selection*).
F_	Transfer button: • Transfers control between software function buttons and IQ-203 front panel hardware function keys (refer to IQ-203 manual). • When software function buttons are disabled, they will BE GRAYED OUT.

Table 5-1. IQ-2100 Function Buttons

Note: *The software function buttons are also available in window monitor mode.*

5.2.3 Data and Status Display

The IQ-2100 data and status display boxes, located on the right side of the IQ-2100 Main window (shown in Figure 5-8), indicate the result of F button actions.

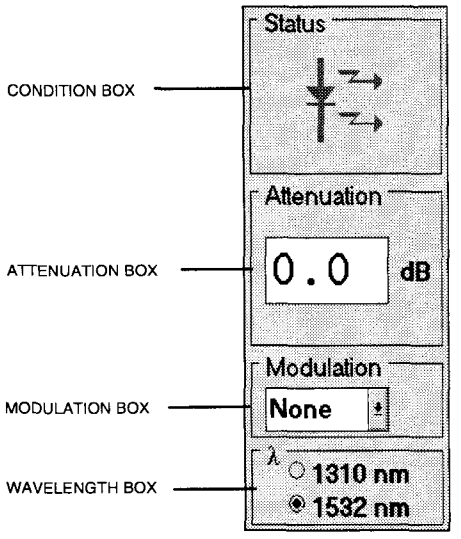


Figure 5-8. IQ-2100 Data and Status Display Boxes

Table 5-2 provides a quick reference guide to these boxes. For further information on operation of the IQ-2100 using the status and display boxes, refer to Section 5.4, *Setting and Emission.*

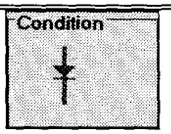
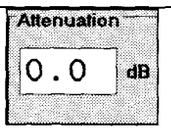
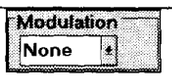
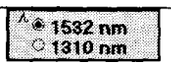
DISPLAY BOX	DESCRIPTION
	• Indicates light source status.
	• Indicates the attenuation level. ⇒ Edit the attenuation value displayed.
	•• Sets the modulation frequencies. ⇒ Select a modulation value in the list box.
	•• Indicates the wavelength. ⇒ Select a wavelength with the radio button.

Table 5-2. IQ-2100 Data and Status Display Boxes

5.3 Exiting the IQ-2100 Main Window

To exit the IQ-2100 Main window and close the software application:

1. From the IQ-2100 Main window, select **Display**.
2. From the **Display** menu, select **Monitor**. This switches to the monitor window.

   Click the control menu box (in the upper left of the monitor window) and select **Close** or,

   Double-click the control menu box or,

   Choose **Exit** in the **File** menu.

This procedure closes the software application and frees system memory.

5.4 Setting and Emission

It is necessary to first set the required source data information using the function buttons in conjunction with the data and status display boxes. The IQ-2100 Light Source can then be powered ON. The four data setting and emission operations are:

- Wavelength Selection
- Attenuation Setting
- Modulation Selection
- Emission Activation/Deactivation

5.4.1 Wavelength Selection

Choose F7 λ to select the emission wavelength (if a dual wavelength source is being used). The selected wavelength will be highlighted in the **Wavelength (λ)** box as shown in Figure 5-9.

- A **Performing laser stabilization** information window will appear to indicate a successful wavelength selection (only if the source is a laser and if the laser is active).

Note: *A wavelength can also be selected by clicking the desired wavelength inside the box.*

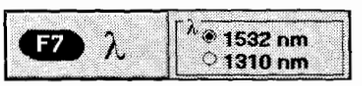


Figure 5-9. Wavelength Button and Box

5.4.2 Attenuation Setting

- Choose Up F4 to increase the attenuation by steps of 0.1 dB. The **Attenuation** edit box will then indicate the increased level of attenuation.

- Choose F5 Down to lower the attenuation by steps of 0.1 dB. The **Attenuation** edit box will then indicate the decreased level of attenuation.

The **Attenuation** edit box shown in Figure 5-10 indicates the level of dB power attenuation (variable power output loss) as selected using the increase and decrease buttons. The range varies up to a maximum of 6 dB for LEDs and 10 dB for lasers (subject to change).

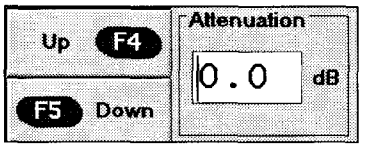


Figure 5-10. Increase/Decrease Buttons and Attenuation Box

5.4.3 Modulation Selection

- Select a desired modulation frequency by choosing a value in the **Modulation** list box, shown in Figure 5-11 among the following available values: 270 Hz, 1 kHz , 2 kHz ,or none.

- Choose Mod F6 to set the selected modulation value.

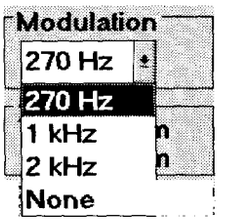


Figure 5-11. Modulation List Box

5.4.4 Emission Activation/Deactivation

Choose ON F2 to activate the light emission. The Active LED on the module front panel will then light up, indicating successful source emission.

- Two red outward arrows will then appear in the **Condition** box, as shown in Figure 5-12, indicating a successful source emission.

Choose F3 OFF to deactivate the light emission. The Active LED on the module front panel will then turn off, indicating source emission deactivation.

- The absence of the red outward arrows and a return to a grayed-out symbol in the **Condition** box indicates source emission deactivation.

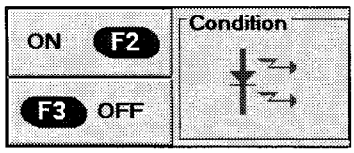


Figure 5-12. Light Source Activation/Deactivation Buttons and Condition Box

6 APPLICATION SUGGESTIONS

It is preferable to connect a terminated fiber under test to a test jumper before connecting to the source port. If the fiber under test is not terminated, add a connector or a bare fiber adapter to the end of the fiber.

Combined with the IQ-1100 Power Meter, the IQ-2100 Light Source may be used for referencing and power loss testing.

6.1 Referencing

Referencing between the IQ-2100 Light Source and the IQ-1100 Power Meter is a procedure which will take into account the loss encountered over test jumpers, connectors, and the light source.

To reference the IQ-1100 power meter:

1. Connect the IQ-2100 light source, test jumper, and bulkhead connector to the IQ-1100 Power Meter.
2. Activate the IQ-2100 light emission.
3. Wait for the IQ-1100 Power Meter reading to stabilize.
4. Choose the reference button in the IQ-1100 Power Meter window.

The reference reading has now been acquired. The reading will be stored in the IQ-1100 reference box until the module has been referenced again.

6.2 Power Loss Testing

Power Loss Testing is a procedure that will record the attenuation reading in dBs, dBms, and watt of a device under test. Prior to testing for attenuation, a reference should be performed as described above.

To test:

1. Connect the test jumper to the IQ-2100 and its other end to the fiber under test.
2. Connect another test jumper to the IQ-1100 Power Meter in the same manner.
3. Activate the IQ-2100 light emission.
4. Monitor the attenuation reading in the IQ-1100 attenuation box.

The attenuation reading has now been acquired. The reading will be stored in the IQ-1100 graph mode.

7 MAINTENANCE AND TROUBLESHOOTING

7.1 Maintenance

There are no user-serviceable components in the IQ-2100. The module has been designed to require a minimum of maintenance and to provide accurate operation for many years to come.

Connecting a multimode fiber to a singlemode IQ-2100 source port is acceptable whereas the reverse will decrease the source power output.

The fiber end must be kept clean at all times, as explained in Section *Module Setup*, to ensure maximum power output.

However, the source port should be cleaned occasionally to ensure minimum insertion loss.

IMPORTANT

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

To clean the source port of the IQ-2100 Light Source:

1. Remove the protector cap.
2. Gently wipe the source port with a lint-free swab dipped in isopropyl alcohol.
3. Dry using a bottle of clean compressed air.

If any abnormal power loss is observed, the source port and pig-tail behind the front panel of the module may require cleaning.

To access and clean the IQ-2100 pig-tail behind the front panel:

1. Power OFF the IQ-203/IQ-206.
2. Remove the module. Refer to Section 3.3, *Module Removal.*
3. Remove the six screws, as shown in Figure 7-1, and slide back the module cover, as shown in Figure 7-2. The fiber connection will be accessible from the module side, shown in Figure 7-3.
4. Carefully disconnect the pig-tail from the bulkhead inside the module.
   - Be sure to fully unscrew the connector before attempting removal.

CAUTION

Be very careful not to force or damage the pig-tail.

5. Clean the fiber end with a swab dipped in isopropyl alcohol.
6. Blow dry compressed air through the port.
7. Carefully replace the connector, slide back the housing, replace the six screws, and reinstall the module.

CAUTION

Be very careful to correctly replace all six screws in order to avoid damage to module.

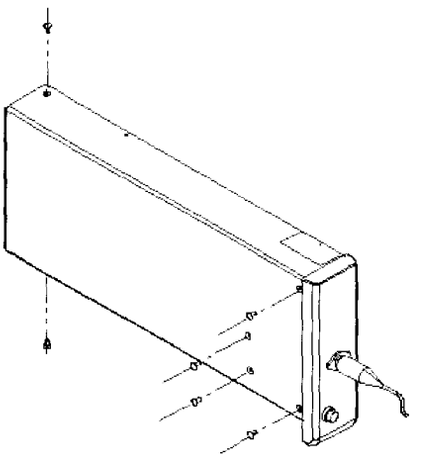


Figure 7-1. Module screws

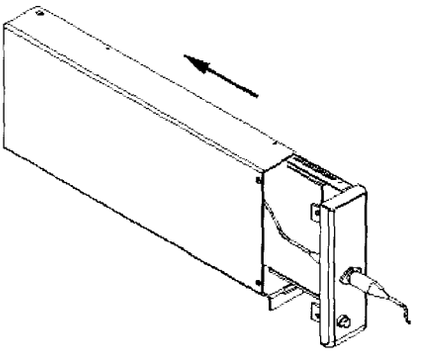


Figure 7-2. Cover slide back

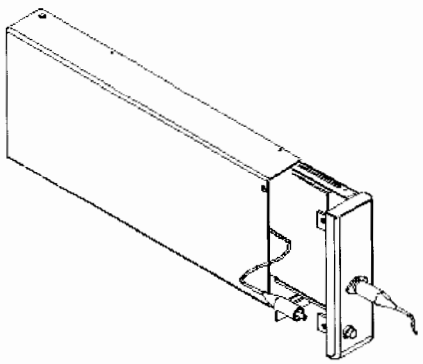


Figure 7-3. Access to connector for cleaning

7.2 Recalibration

Although not imperative, an annual recalibration is recommended to ensure that the module remains within the IQ-2100 specified calibration tolerances. Please call EXFO for further information regarding calibration.

7.3 Troubleshooting

Problem	Probable Cause	Recommended Action
LED push button does not illuminate	- Power not on	- Check AC power cord and power ON the IQ-203 and IQ-206. - Refer to IQ-203 manual to verify fuse
	- Module is not properly inserted	- Power OFF the IQ-203 and IQ-206, remove and reinstall the module
	- Computer crashes	- Reboot the IQ-203
	- LED is burnt	- Call EXFO
Pushing the LED push button does not open the module Main window	- Computer crashes	- Reboot the IQ-203
Questionable power meter reading	- Dirty optical connectors	- Clean all optical connections
	- Input and output optical path not respected	- Switch input and output connections
	- Improper wavelength selected	- Switch to the correct wavelength on all instruments being used
	- Optical source is unstable	- Wait for source to stabilize

- In all cases, if problem persists after performing recommended action, call EXFO (see *Getting Help*).

8 IQ-2100 TECHNICAL SPECIFICATIONS

8.1 Specifications Page

Specifications apply to a 2 m fiber output (specified type) with FC/SPC (singlemode) and FC/PC (multimode) connectors, and are valid for a 0.0 dB attenuation.

IQ-2100 Fabry-Perot TE-Cooled Laser Modules

Model	IQ-2102BLC	IQ-2103BLC	IQ-2123BLC
Wavelength[1] -nm	1310 ±20	1550 ±20	1310 / 1550 ±20
Spectral Width -nm rms	≤ 2.5	≤ 4	≤ 2.5 / 4
Power Output[2] -dBm	≥ 0	≥ 0	≥ -1
Stability[3] -dB - 15 min. (T = constant)	± 0.003	± 0.003	± 0.005
- 8 hr. (T = 0 to 50°C ±1°C)	± 0.03	± 0.03	± 0.05
Modulation	270 Hz, 1 kHz, 2 kHz (50% duty cycle)		
Temperature Stability[4] -dB	≤ 0.25		

IQ-2100 LED Surface Emitter Modules

Model	IQ-2101C/D	IQ-2102C/D	IQ-2112C/D
Wavelength[1] -nm	850 ±25	$1300\ ^{+45}/_{-60}$	850 / 1300 ±25 / $^{+45}/_{-60}$
Spectral Width -nm (FWHM)	≤ 50	≤ 145	≤ 50 / 145
Power Output -dBm	C ≥ -17	C ≥ -21	C ≥ -18 / -22
	D ≥ -14	D ≥ -17	D ≥ -15 / -18
Stability[3] -dB - 15 min. (T = constant)	± 0.003	± 0.003	± 0.005
- 8 hr. (T = 0 to 50°C ±1°C)	± 0.03	± 0.03	± 0.05
Modulation	270 Hz, 1 kHz, 2 kHz (50% duty cycle)		
Temperature Stability[4] -dB	≤ 0.4		

1. Valid over a total operation temperature range.
2. Class 1 according to FDA CFR21.
3. Valid after an active source 1 hour warm-up period. 30 minutes if the module is stored beforehand at the same temperature.
4. For temperature range variations from 0 to +50°C.
   Specifications are subject to change without notice.

Operating Environment	
Operating temperature	32 to 122 °F / 0 to +50 °C
Storage temperature	-31 to 158 °F / -35 to +70 °C
Relative humidity[1]	0 to 95% non-condensing

Mechanical Specifications	
Dimensions	Width: 1.5" / 3.8 cm Height: 4.75" / 12.0 cm Length: 10.3" / 26.2 cm
Weight	1.25 lb / 0.5 kg

1. Measured in 0° to 40°C temperature range.

9 GENERAL INFORMATION

9.1 Warranty

EXFO E.O. Engineering (EXFO) warrants this equipment against defects in material and workmanship for a period of one year 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 the first year 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.

9.2 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.

9.3 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.

9.4 Certification

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

9.5 Service and Repairs (Under Warranty or Other)

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

- Call the EXFO Product Support Group. Support personnel will determine if the equipment requires service, repair, or calibration.

Product Support Group:

USA and Canada
Tel.: 1-800-663-EXFO
Fax: 1-418-683-2170

International
Tel.: 1-418-683-0211
Fax: 1-418-683-2170

EXFO Europe
Tel.: 33-1-34.63.00.20
Fax: 33-1-34.65.90.93

- 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.

9.6 Transportation and Storage

Stay within a temperature range of -35 to +70°C 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.

10 CUSTOMER COMMENTS

10.1 IQ 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 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: _____
(indicated in **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).
_____
_____
_____
_____

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