User Guide

IQS-9100/9100B

Optical Switch for IQS platforms

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Telecom Test and Measurement

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EXPERTISE REACHING OUT

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Units of Measurement

Units of measurement in this publication conform to SI standards and practices.

Patents

EXFO's Universal Interface is protected by US patent 6,612,750.

Version number: 4.0.0

Contents

Certification Information

North America Regulatory Statement on Product Safety

This unit was certified by an agency approved in both Canada and the United States of America. It has been evaluated according to applicable North American approved standards for product safety for use in Canada and the United States.

Electronic test and measurement equipment is exempt from FCC part 15, subpart B compliance in the United States of America and from ICES-003 compliance in Canada. However, EXFO Inc. makes reasonable efforts to ensure compliance to the applicable standards.

The limits set by these standards 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 user guide, 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.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

European Community Declaration of Conformity

DECLARATION OF CONFORMITY

Application of Council Directive(s):
2006/95/EC – The Low Voltage Directive
2004/108/EC – The EMC Directive
93/68/EEC – CE Marking
And their amendments

Manufacturer's Name and Address:

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Equipment Type/Environment:
Test & Measurement / Industrial
Trade Name/Model No.:
Optical Switch / IQS-9100 & IQS-9100B

Standard(s) to which Conformity is declared:

EN 61010-1:2001 Edition 2.0	**Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements**
EN 61326-1:2006	**Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements**

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive and Standards.

Manufacturer:

Stephen Bull, E. Eng
Vice-President Research and Development

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November 23, 2011

CE EXFO

1 Introducing the IQS-9100/9100B Optical Switch

Main Features

The IQS-9100/9100B Optical Switch provides fiber-to-fiber positioning of optical signals for a number of optical applications. This module, which exists in various models depending on the number of optical ports and configuration options it has, allows you to quickly switch light from one fiber to another.

- This optical switch can be controlled using applications available in the IQS Manager software.
- The applications can control one or more modules at a time and allow for various configurations.
- The configurations can be modified at any time and can be saved for future use, allowing you to save time and be more efficient.

The IQS-9100/9100B Optical Switch supports local control (via the IQS Manager software) and remote control (through GPIB, RS-232, or Ethernet TCP/IP using SCPI commands or the provided LabVIEW drivers). For more information, refer to the *IQS platform* user guide.

Available Models

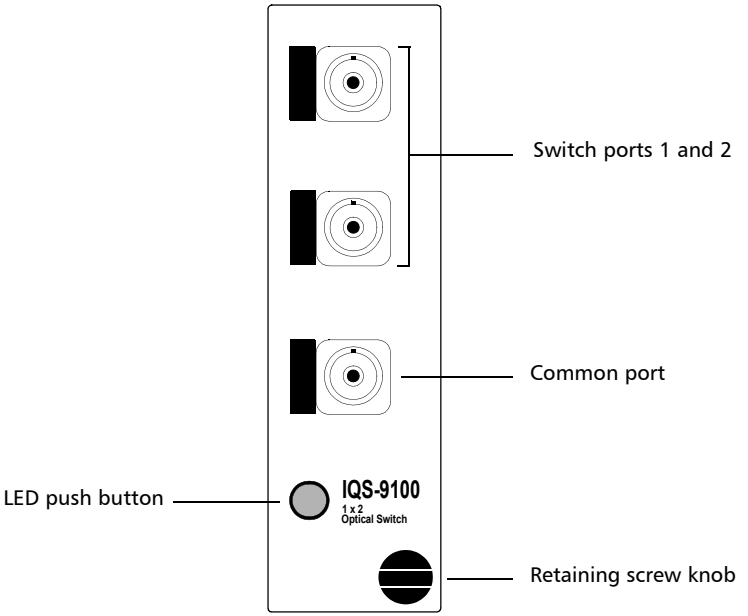
The Optical Switch comes in two different models:

Model	Features
IQS-9100	➤ singlemode or multimode ➤ available in 1 x n and 2 x n configurations
IQS-9100B	➤ singlemode ➤ available in 1 x n configuration

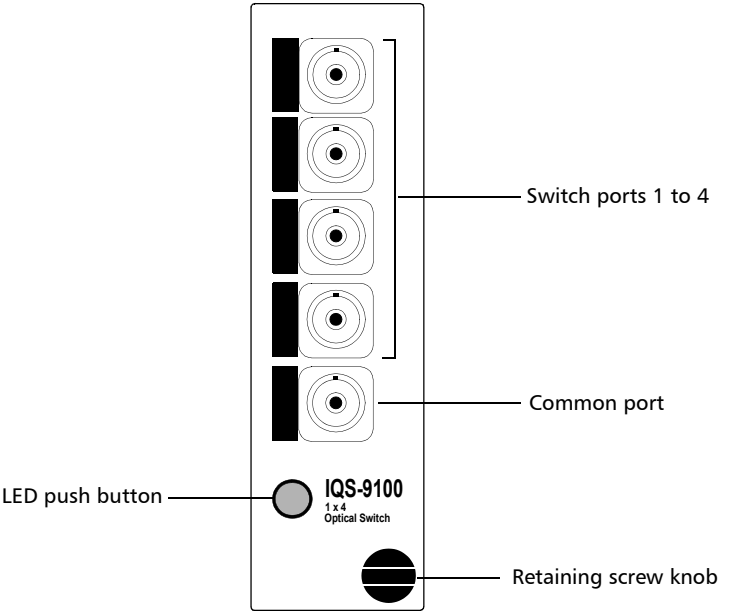
The different available switch configurations are shown in the following figures, except for the 1 x 8 and the 1 x 24 optical switch models.

Note: *Actual connectors may differ from those depicted in the illustrations.*

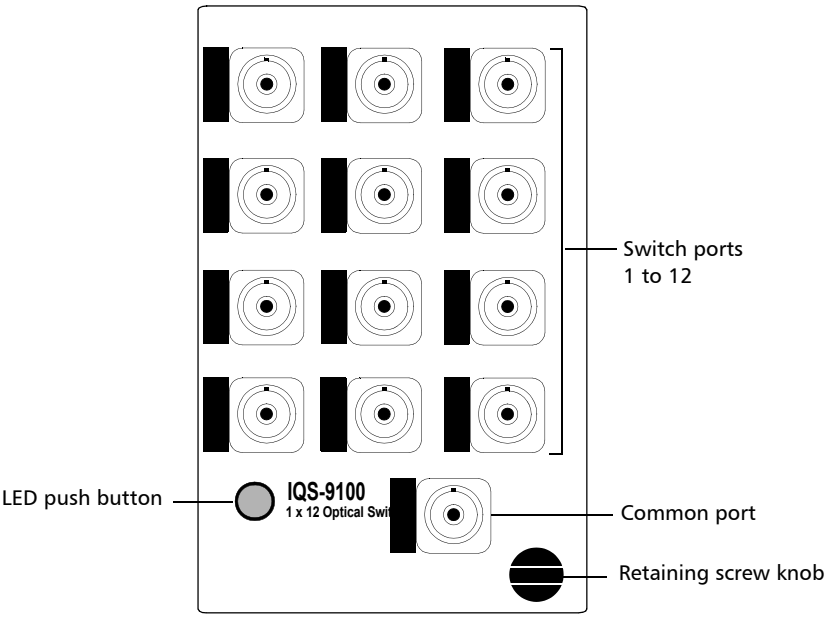
1 x 2 Optical Switch Module



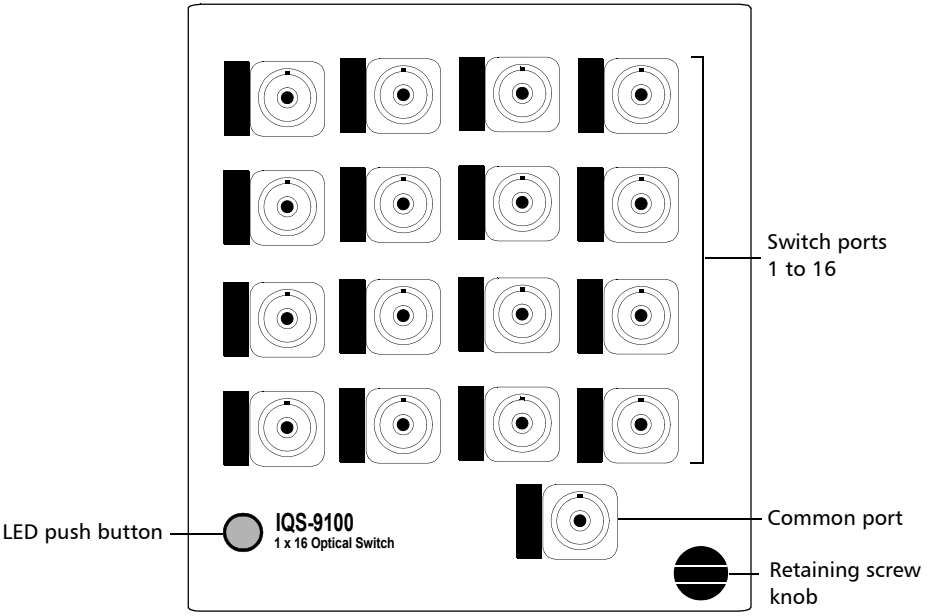
1 x 4 Optical Switch Module



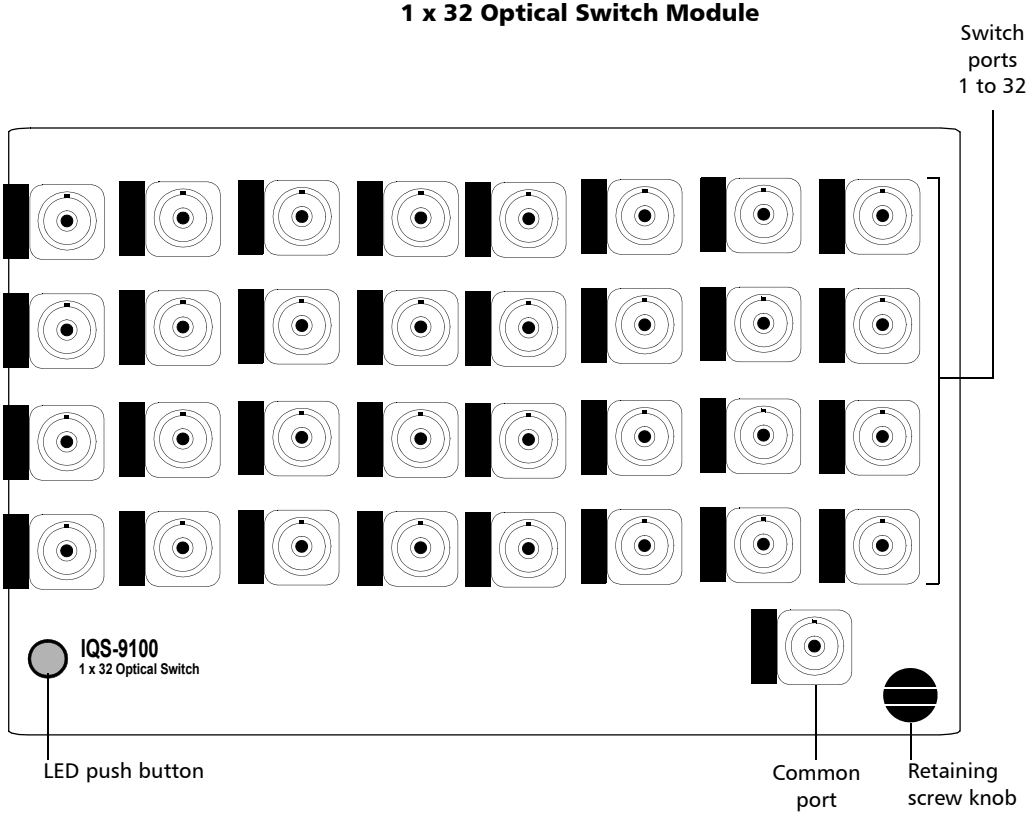
1 x 12 Optical Switch Module



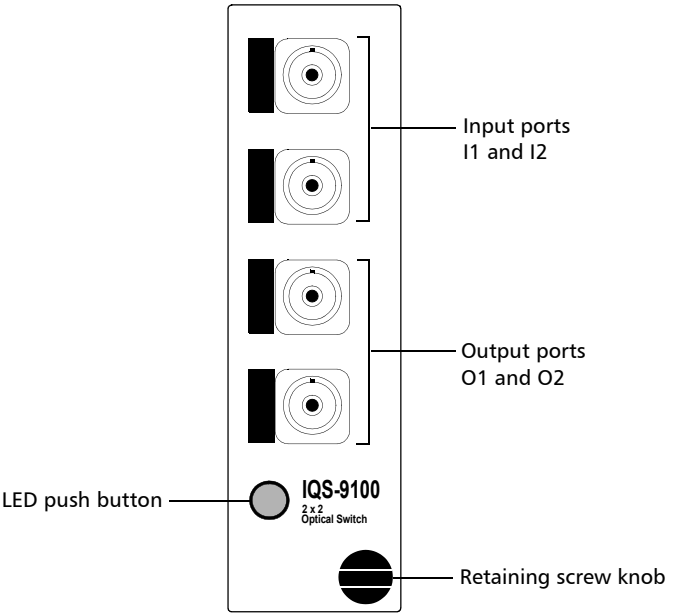
1 x 16 Optical Switch Module



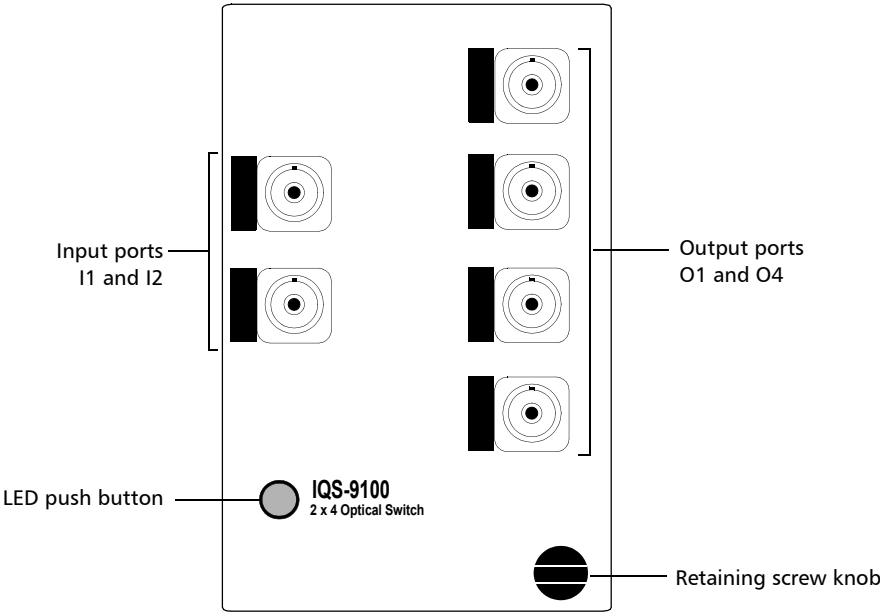
1 x 32 Optical Switch Module



2 x 2 Optical Switch Module
(IQS-9100 Optical Switch only)



2 x 4 Optical Switch Module
(IQS-9100 Optical Switch only)

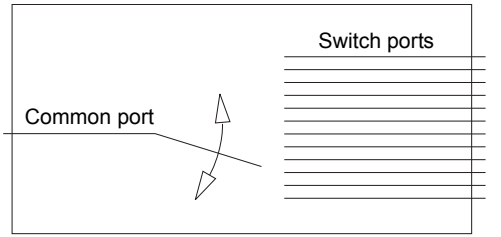


Basic Switching Principles

The switch ports of 1 x N optical switches are numbered on the front panel, while the common port is identified with a "C."

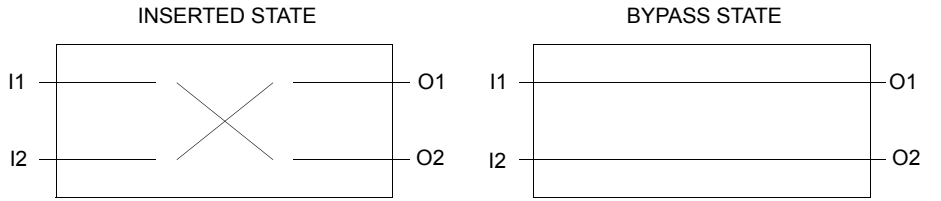
These switches are bidirectional. This means that the optical signal can either enter through the common port and be directed toward any switch port, or enter through any switch port and then be directed toward the common port.

1 x N Optical Switch Principle



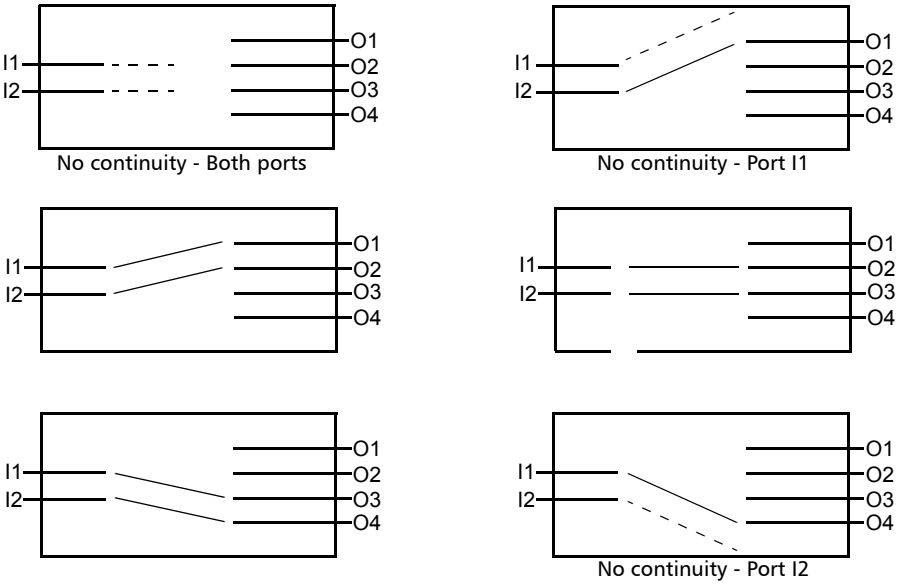
The IQS-9100-02-02 (2 × 2 model) is also a bidirectional switch. The two positions for this switch are known as inserted state and bypass state.

2 x 2 Optical Switch Principle
(IQS-9100 Optical Switch only)



The IQS-9100-02-04 (2 × 4 model) is also a bidirectional switch. As illustrated in the following figure, the IQS-9100-02-04 can be set to six positions. In three of these positions, one or both input channels do not transmit light to output ports.

2 x 4 Optical Switch Principle
(IQS-9100 Optical Switch only)



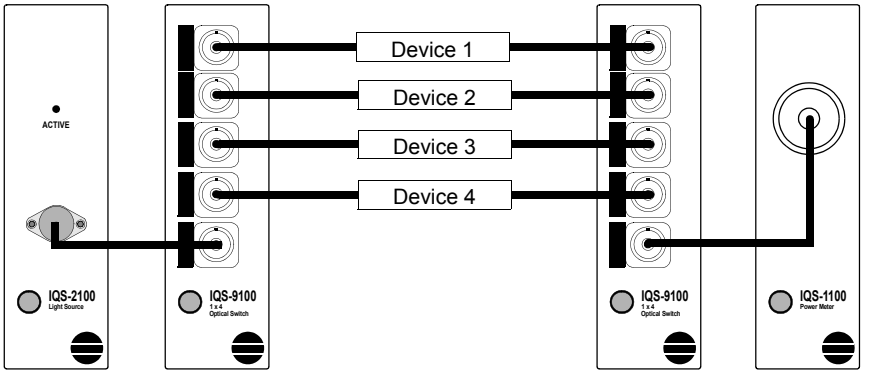
Typical Applications

Testing with Multiple Devices

Using two optical switches, a light source and a power meter, it is possible to perform automated qualification and production testing for multiple devices.

To perform automated qualification and production testing for multiple devices:

1. Connect the modules and DUTs as shown below.



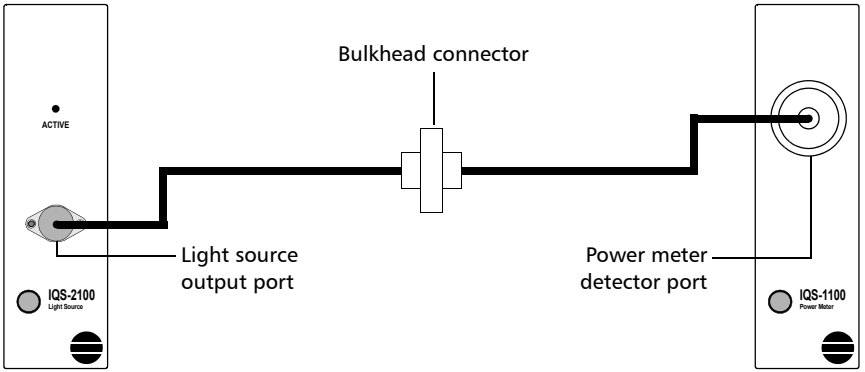
2. Measure the DUTs with the power meter.

Measuring Optical Switch Port Insertion Loss

The insertion loss (IL) of any switch port can be measured using a light source, power meter, and the IQS-9100/9100B Optical Switch.

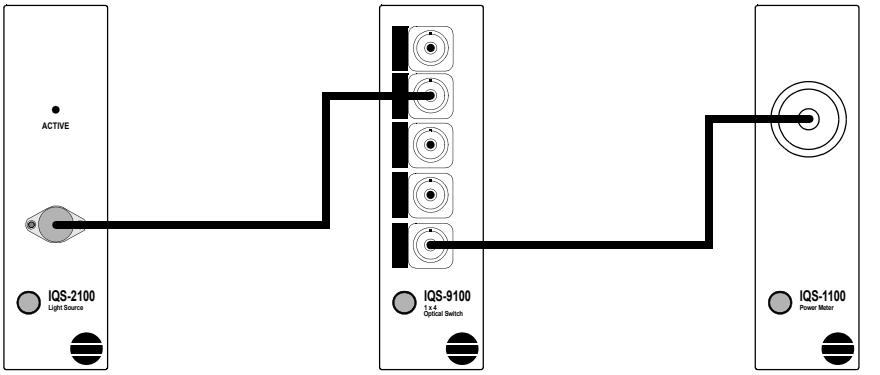
To measure optical switch port insertion loss:

1. Connect the light source output port to the power meter detector port using two test jumpers linked with a bulkhead connector.



2. Store the power reading obtained as a reference value in the power meter.

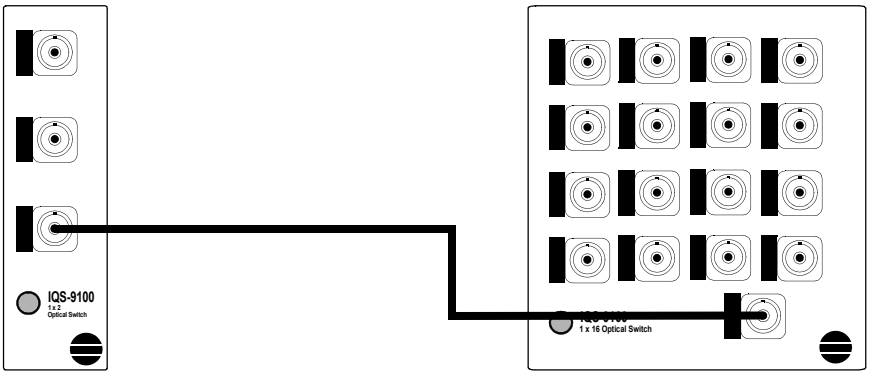
3. Using the same test jumpers, connect the light source to one of the IQS-9100/9100B Optical Switch ports, and connect the switch common port to the power meter detector port (the IQS-9100/9100B Optical Switch now replaces the bulkhead connector).



4. The IL registered on the power meter will then be the IQS-9100/9100B Optical Switch port IL including connectors.

Creating Customized Switch Configurations

By interconnecting two or more switch modules, customized switch configurations can be built. For example, 1 × 2 and 1 × 16 switches can be connected to create a 2 × 16 switch configuration. To do so, simply connect the common ports of both switches.



Conventions

Before using the product described in this guide, you should understand the following conventions:

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in *death or serious injury*. Do not proceed unless you understand and meet the required conditions.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *minor or moderate injury*. Do not proceed unless you understand and meet the required conditions.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *component damage*. Do not proceed unless you understand and meet the required conditions.

IMPORTANT

Refers to information about this product you should not overlook.

The maximum input power for the IQS-9100/9100B Optical Switch is ⎓ 4 W. For more information on equipment ratings, refer to the *IQS-600 Integrated Qualification System* user guide.

2 Getting Started with Your Optical Switch

CAUTION

Your Optical Switch contains sensitive precision optical components. To ensure reliable, long-term service, observe proper handling and operating instructions. At no time should the module be subject to shock or impact.

WARNING

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

WARNING

The use of controls, adjustments and procedures other than those specified herein may result in exposure to hazardous situations or impair the protection provided by this unit.

IMPORTANT

When you see the following symbol on your unit  **, make sure that you refer to the instructions provided in your user documentation. Ensure that you understand and meet the required conditions before using your product.**

Inserting and Removing Test Modules

CAUTION

Never insert or remove a module while the controller unit and its expansion units are turned on. This will result in immediate and irreparable damage to both the module and unit.

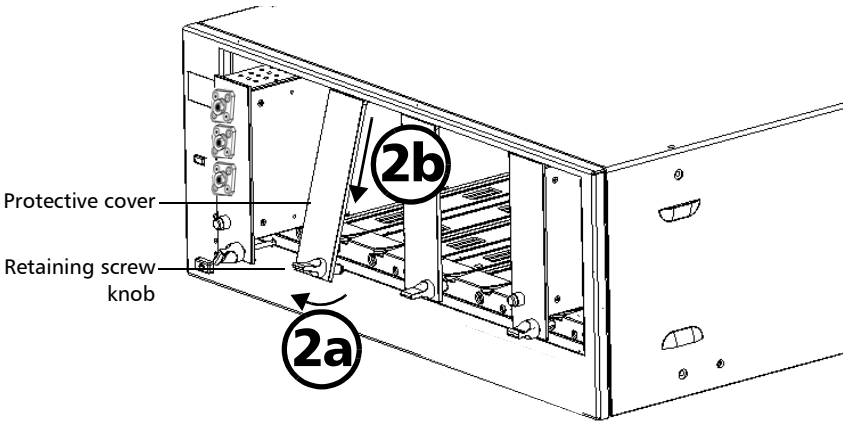
To insert a module into the controller or expansion unit:

1. Exit IQS Manager and turn off all your units.

2. Remove the protective cover from the desired unused module slot.

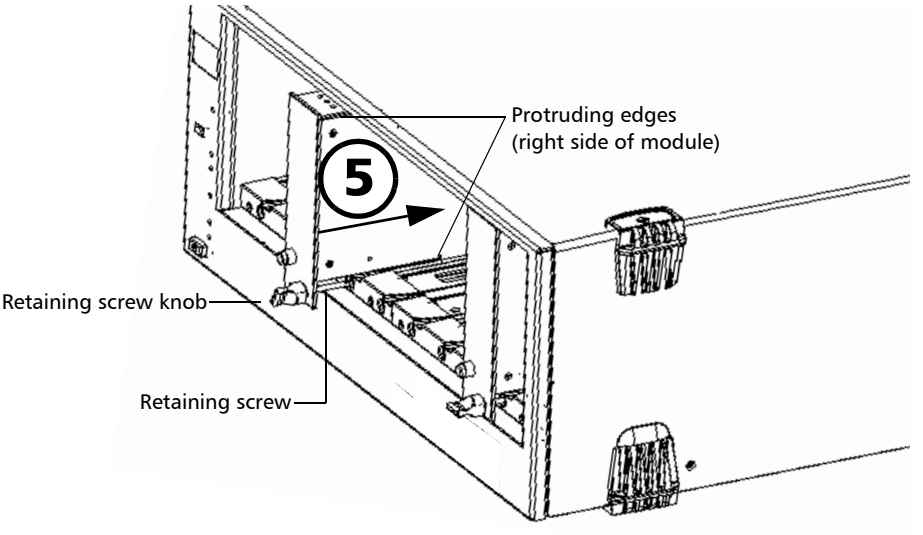
2a. Pull the retaining screw knob firmly towards you and release the bottom of the cover.

2b. Gently pull the top of the protective cover downwards, to remove it from the unit grooves.



3. Position the module so that its front panel is facing you and the top and bottom protruding edges are to your right.

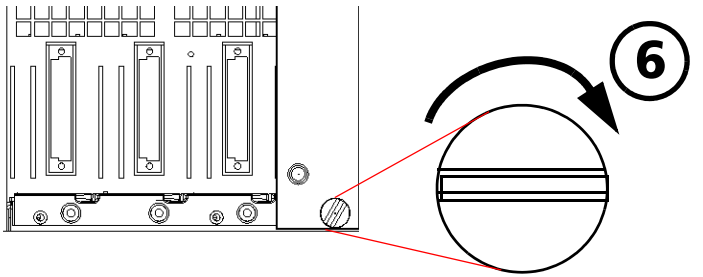
4. Insert the protruding edges of the module into the grooves of the unit's module slot.



5. Push the module all the way to the back of the slot, until the retaining screw makes contact with the unit casing.

6. While applying slight pressure to the module, turn the retaining screw knob (located at the bottom of the panel) clockwise until the knob is horizontal.

This will secure the module into its "seated" position.



The module is correctly inserted when its front panel is flush with the front panel of the controller or expansion unit.

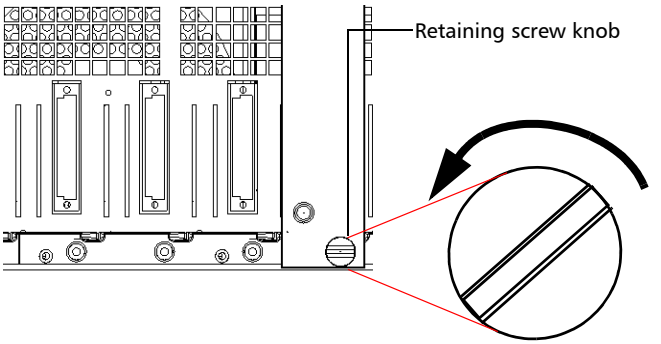
When you turn on the controller unit, the startup sequence will automatically detect your module.

Note: *You can insert IQ modules into your controller or expansion unit; the IQS Manager software will recognize them. However, the IQS-9100/9100B locking mechanism (retaining screw) will not work for IQ modules.*

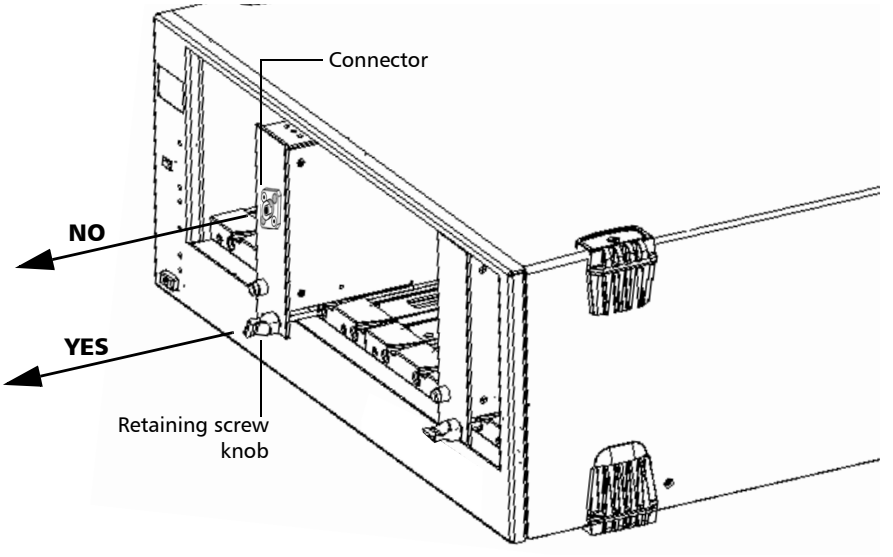
To remove a module from your controller or expansion unit:

1. While pulling gently on the knob, turn it counterclockwise until it stops.

The module will slowly be released from the slot.



2. Place your fingers underneath the module or hold it by the retaining screw knob *(NOT by the connector)* and pull it out.



CAUTION

Pulling out a module by a connector could seriously damage both the module and connector. Always pull out a module by the retaining screw knob.

3. Cover empty slots with the supplied protective covers.

3a. Slide the top of the protective cover into the upper grooves of the unit.

3b. Snap the cover into place by pushing the retaining screw knob.

CAUTION

Failure to reinstall protective covers over empty slots will result in ventilation problems.

Starting the Optical Switch Application

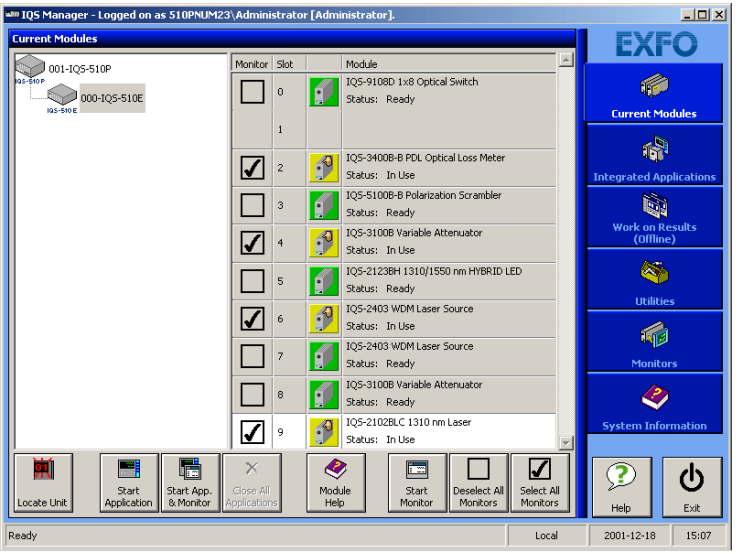
Your IQS-9100/9100B Optical Switch module can be configured and controlled from its dedicated IQS Manager application.

Note: *For details about IQS Manager, refer to the* IQS platform *user guide.*

To start the application:

1. From the **Current Modules** function tab select the module to use.

   It will turn white to indicate that it is highlighted.



2. Click **Start Application**.

   OR

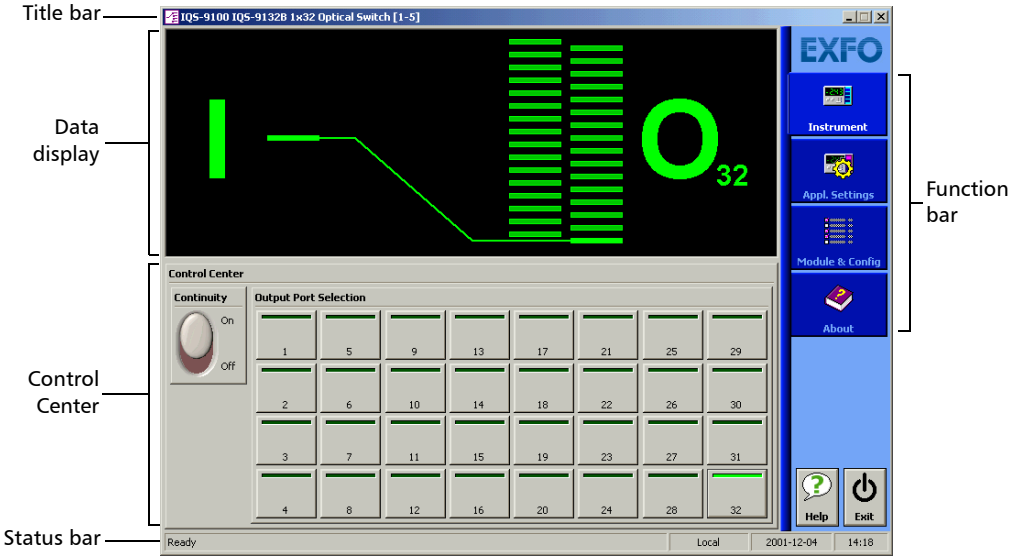
   Press the green LED push button on the front of the corresponding module.

   You can also double-click its row.

Note: *Pressing the LED push button will not activate or turn on the module.*

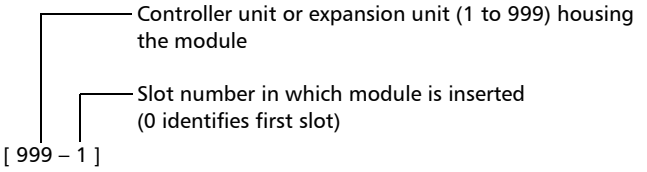
Note: *To start the corresponding monitor window at the same time, click* **Start App. & Monitor**. *The window opens on the* **Monitors** *function tab.*

The main window (shown below) contains all the commands required to control the Optical Switch:



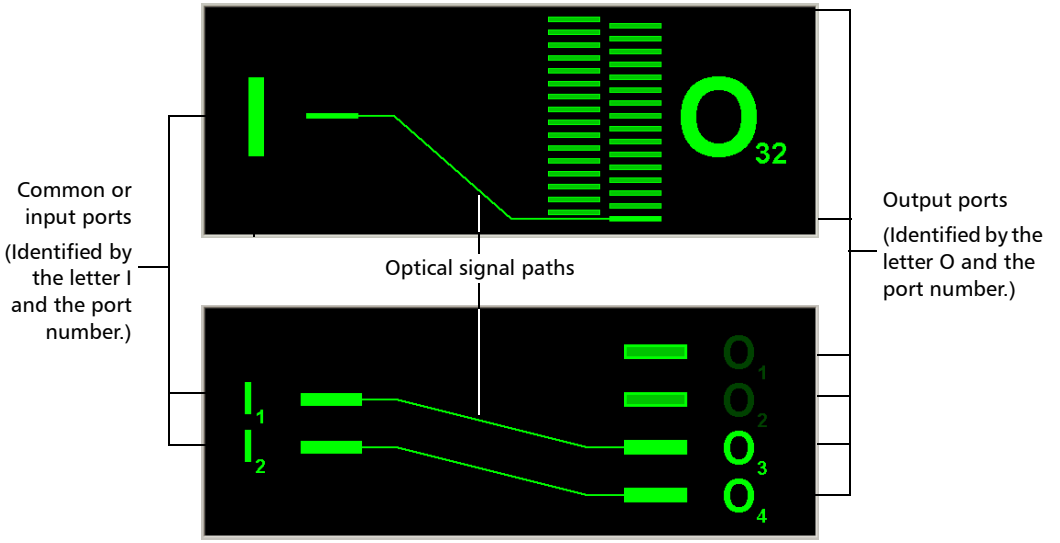
Title Bar

The title bar is located at the top of the main window. It displays the module name and its position in the controller or expansion unit. The module position is identified as follows:



Data Display

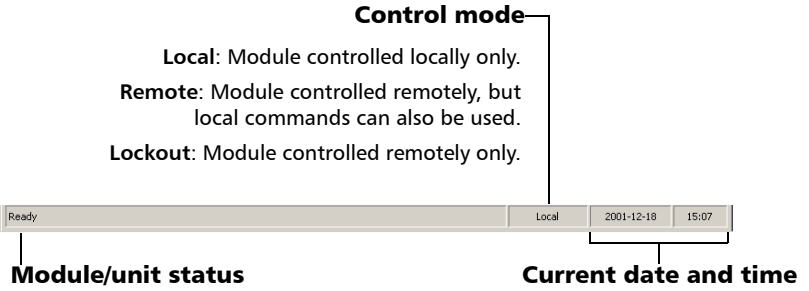
1 x N optical switch



2 x N optical switch
(IQS-9100 Optical Switch only)

Status Bar

The status bar, located at the bottom of the main window, identifies the operational status of the IQS-9100/9100B Optical Switch.



For more information about automating or remotely controlling the IQS-9100/9100B Optical Switch, refer to your platform user guide.

Exiting the Application

Closing any application that is not currently being used helps freeing system memory.

To close the application from the main window:

Click  in the top right corner of the main window.

OR

Click the **Exit** button located at the bottom of the function bar.

To close all currently running applications:

From IQS Manager, click **Close All Applications**.

3 Operating the Optical Switch

The IQS-9100/9100B Optical Switch comes in different models, depending on the number of ports and switch configurations it has. To use its different models more efficiently, follow the instructions provided in this section.

Before using the IQS-9100/9100B Optical Switch in a test setup, you must first connect the ports to other test components and select a switching configuration.

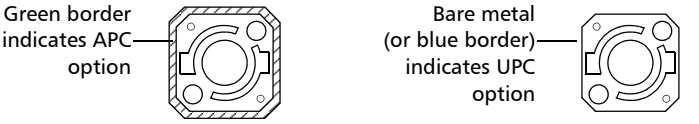
Note: *You can configure your switch before connecting it to your test setup.*

CAUTION

Your Optical Switch contains sensitive precision optical components. To ensure reliable, long-term service, observe proper handling and operating instructions. At no time should the module be subject to shock or impact.

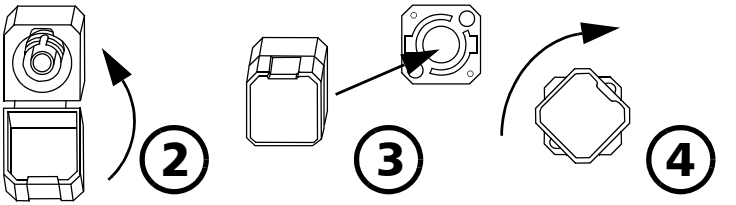
Installing the EXFO Universal Interface (EUI)

The EUI fixed baseplate is available for connectors with angled (APC) or non-angled (UPC) polishing. A green border around the baseplate indicates that it is for APC-type connectors.



To install an EUI connector adapter onto the EUI baseplate:

1. Hold the EUI connector adapter so the dust cap opens downwards.



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

3. Insert the connector adapter into the baseplate.

4. While pushing firmly, turn the connector adapter clockwise on the baseplate to lock it in place.

Cleaning and Connecting Optical Fibers

IMPORTANT

To ensure maximum power and to avoid erroneous readings:

- **Always inspect fiber ends and make sure that they are clean as explained below before inserting them into the port. EXFO is not responsible for damage or errors caused by bad fiber cleaning or handling.**
- **Ensure that your patchcord has appropriate connectors. Joining mismatched connectors will damage the ferrules.**

To connect the fiber-optic cable to the port:

1. Inspect the fiber using a fiber inspection microscope. If the fiber is clean, proceed to connecting it to the port. If the fiber is dirty, clean it as explained below.
2. Clean the fiber ends as follows:
   - **2a.** Gently wipe the fiber end with a lint-free swab dipped in isopropyl alcohol.
   - **2b.** Use compressed air to dry completely.
   - **2c.** Visually inspect the fiber end to ensure its cleanliness.

3. Carefully align the connector and port to prevent the fiber end from touching the outside of the port or rubbing against other surfaces.

   If your connector features a key, ensure that it is fully fitted into the port's corresponding notch.

4. Push the connector in so that the fiber-optic cable is firmly in place, thus ensuring adequate contact.

   If your connector features a screwsleeve, tighten the connector enough to firmly maintain the fiber in place. Do not overtighten, as this will damage the fiber and the port.

Note: *If your fiber-optic cable is not properly aligned and/or connected, you will notice heavy loss and reflection.*

EXFO uses good quality connectors in compliance with EIA-455-21A standards.

To keep connectors clean and in good condition, EXFO strongly recommends inspecting them with a fiber inspection probe before connecting them. Failure to do so will result in permanent damage to the connectors and degradation in measurements.

Optimizing the Application for Repeatability

The optimization for repeatability ensures better accuracy in positioning the light path when switching.

- With optimization activated, every time a switching occurs, the switch mechanism returns to the "no continuity" (**Off**) position before aligning to a new channel position. This option provides better precision, but with slower switching.
- With optimization deactivated, the switch mechanism goes directly to the new channel position. This option provides faster switching, but with less precision.

Note: *This option is NOT available in the 1 x 2, 2 x 2 and 2 x 4 models.*

To optimize switching for repeatability:

1. In the main window, select the **Settings** function tab.

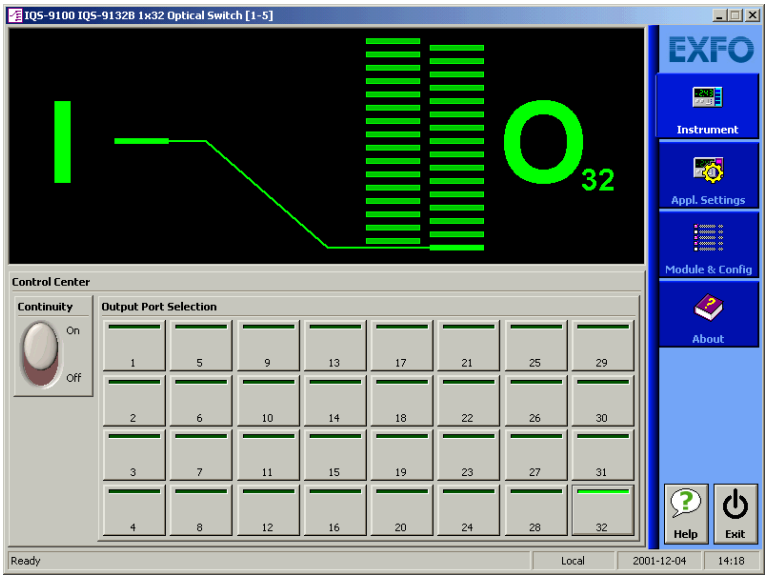
2. Click the **Optimize for Repeatability** button. The light indicator on the button will turn bright green to indicate optimization is active.

Selecting Configurations with the 1 x n Model

The different configurations available in the 1 x n optical switch model allow you to access a number of switch possibilities.

To select configurations with the 1 x n model optical switch:

1. Set the **Continuity** switch to the **On** or **Off** position, depending on whether or not you want the light signal to pass through the optical switch.

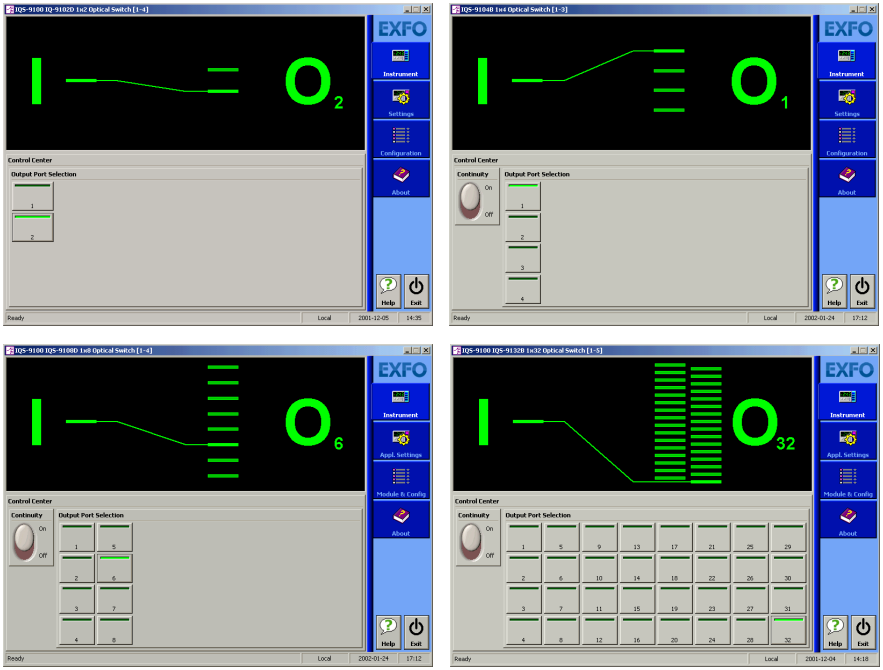


Note: *For the 1 x 2 model, the **Continuity** function is not available in the **Control Center**.*

2. In the **Output Port Selection** panel, select the port through which you want to direct the light.

Note: *You can change the output port at any time, and as many times as you want. You cannot preset output switch port activation sequences from the control application with 1 x n optical switches. You must activate each port manually.*

Following are some of the modules that match the 1 x n model (1 x 2, 1 x 4, 1 x 8 and, 1 x 32 models shown. 1 x 12, 1 x 16 and 1 x 24 models also available).



You can also select a configuration from the QuickTools utility. For details, see *Monitoring Optical Switch Modules* on page 47.

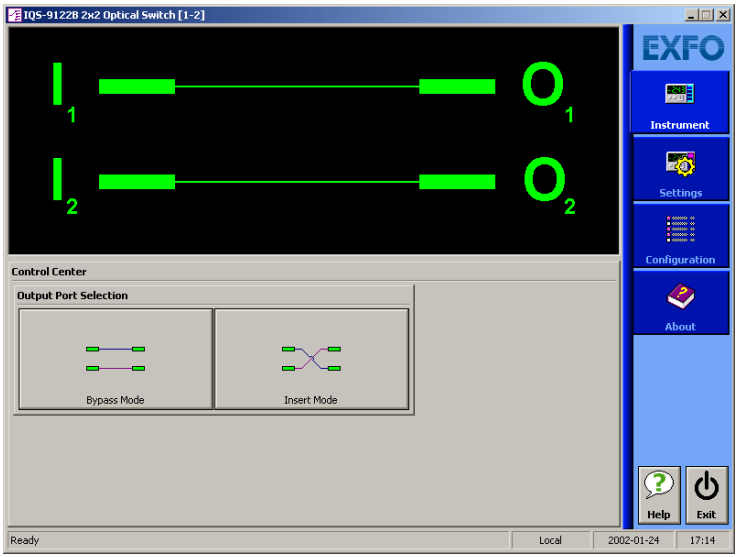
Selecting Configurations with the 2 x 2 Model (IQS-9100 Optical Switch only)

The 2 x 2 optical switch model offers two configurations:

- Bypass mode
- Insert mode

To select a configuration with the 2 x 2 optical switch model:

- Click **Bypass Mode** or **Insert Mode**, according to the configuration you want to use.



You can also select a configuration from the QuickTools utility. For details, see *Monitoring Optical Switch Modules* on page 47.

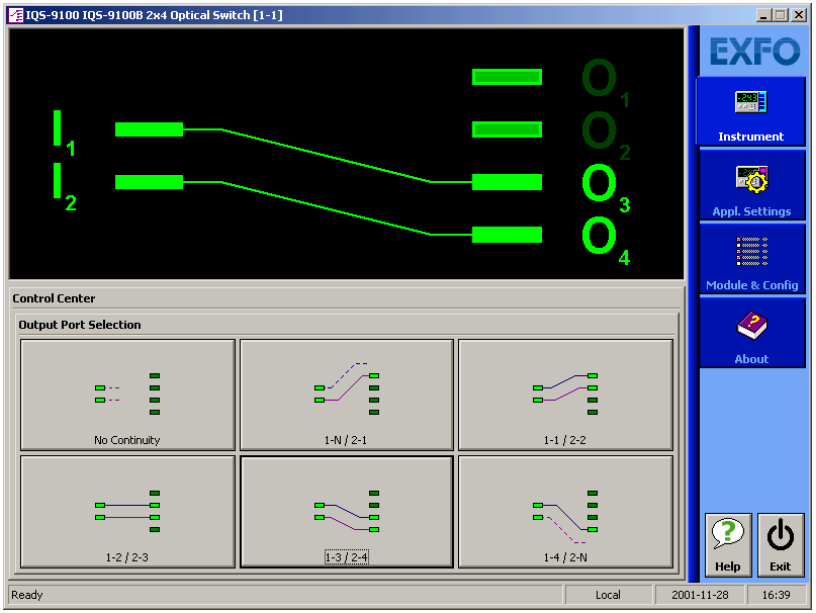
Note: *For the 2 x 2 model, the **Continuity** function is not available in the **Control Center**.*

Selecting Configurations with the 2 x 4 Model (IQS-9100 Optical Switch only)

The different configurations available with the 2 x 4 optical switch model provides six switch possibilities.

To select a configuration with the 2 x 4 optical switch model:

➤ In the **Output Port Selection** panel, click the button for the configuration you want. For more information on 2 x 4 model configurations, see *2 x 4 Optical Switch Module (IQS-9100 Optical Switch only)* on page 9.



You can also select a configuration from the QuickTools utility. For details, see *Monitoring Optical Switch Modules* on page 47.

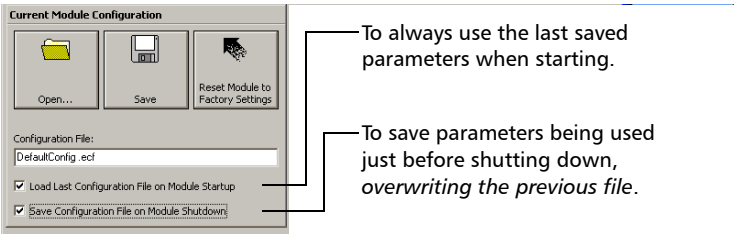
Saving and Recalling Configurations

Once you have set the IQS-9100/9100B Optical Switch parameters, you can save your custom configuration and recall it at any time. You can also recall the factory-defined settings.

Saved configurations include all parameters set in the **Control Center** (**Instrument** function tab) and in the **Settings** function tab (if present).

To save a configuration:

1. Select the **Configuration** function tab.



2. Under **Current Module Configuration**, enter the name you want to use for your configuration file.

   It will be saved in *D:\Program Files\EXFO IQS Manager\AppConfig\(your_module)*.

3. Click **Save**.

To recall a configuration:

1. Select the **Configuration** function tab.
2. Click **Open**.
3. Select the configuration file you want to recall and confirm your action.

   You will return to your application and the new parameters will be set.

To revert to factory settings:

1. Select the **Configuration** function tab.
2. Click the **Reset Module to Factory Settings** button.

IMPORTANT

Reverting to the factory settings will interrupt any module operation in progress.

IMPORTANT

The operation may take a few seconds to complete.

4 Controlling Multiple Optical Switch Modules

With your platform, you can set common parameters and simultaneously operate several modules *of the same kind* in a single interface, which is particularly useful in larger systems.

Note: *You should be familiar with the configuration and operation of a single module before controlling multiple modules simultaneously.*

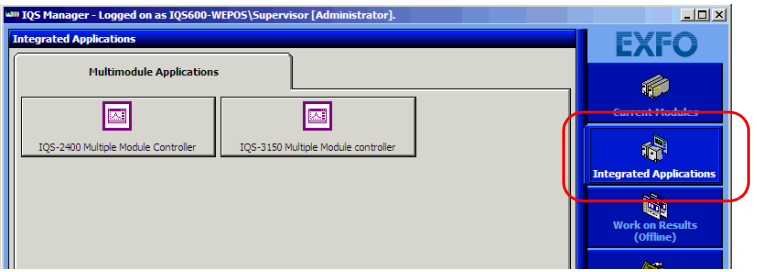
Starting a Multimodule Application

The multimodule applications available will change according to your module configuration (model, type, etc.).

Note: *When you start a multimodule application, you cannot open a monitor window at the same time, as it is possible with a single-module application. You must open the monitor window independently.*

To start a multimodule application:

1. In IQS Manager, select the **Integrated Applications** function tab.



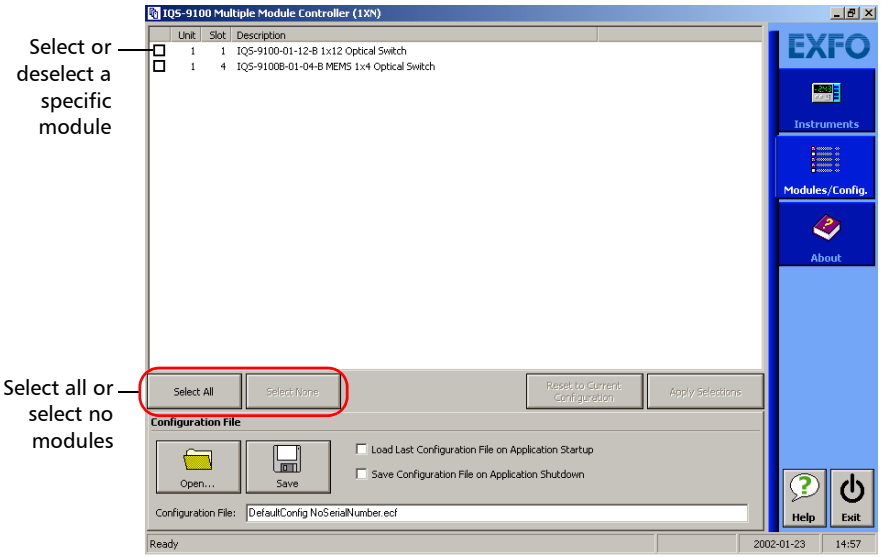
2. Click the appropriate **Multiple Module Controller** button.

   The multimodule application appears in a new window.

Note: *More than one **Multiple Module Controller** button may be displayed if different models are present in your platform.*

Selecting Modules to Control

Before you can modify the module parameters, you must specify which modules you intend to use.



To select IQS-9100/9100B Optical Switch modules:

1. On the **Modules/Config** function tab, select the boxes corresponding to the modules you want to control.

   OR

   Click **Select All** if you want to work with all IQS-9100/9100B Optical Switch modules.

2. Click **Apply Selections** and click the **Instruments** function tab.

Setting Parameters for Multiple Modules

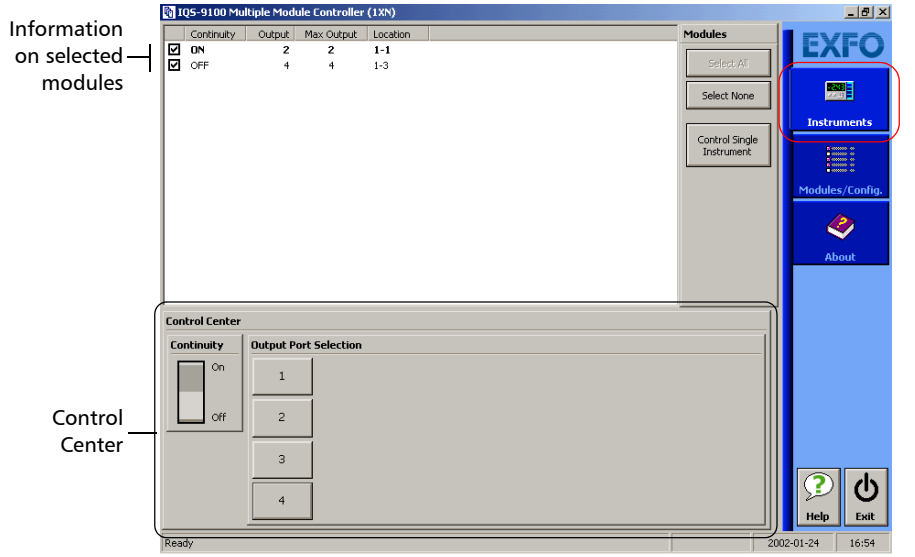
Setting up and operating your IQS-9100/9100B Optical Switch is the same when controlling one or many modules at the same time. For more information, see *Operating the Optical Switch* on page 27.

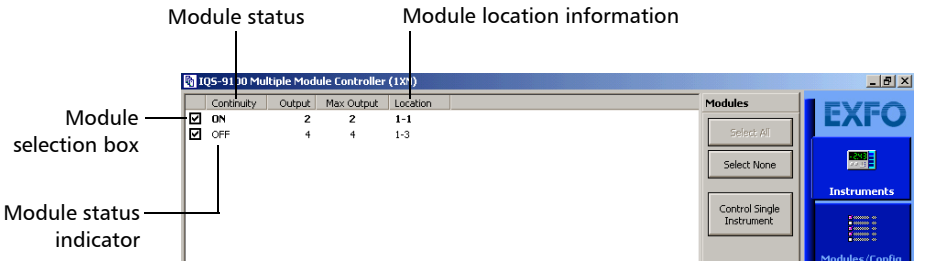
In the multimodule application, the data display in the upper part of the **Instruments** function tab provides you with useful information about the modules.

- Information is displayed in black, except when a module is stabilizing or executing a command, in which case it is displayed in red.
- The last column in the data display provides information about the module location (unit and slot). Notice that slot numbers start at 0.

To set parameters for all selected modules:

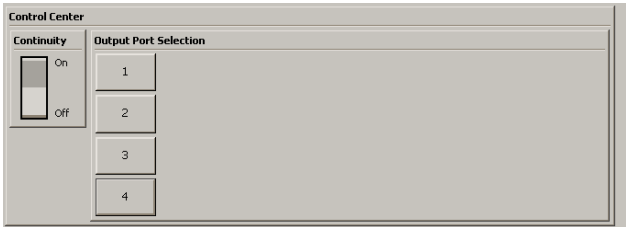
1. Select the Instruments function tab.



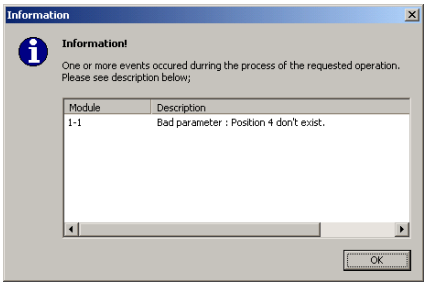


2. Make sure that the check box corresponding to each module to configure is selected.

3. Select the appropriate control.



The controls displayed in the **Control Center** are similar to those in the single-module application. If one or more modules cannot execute a command triggered by the activation of a control, an **Information** window is displayed, and identifies for which modules the control is inoperative.



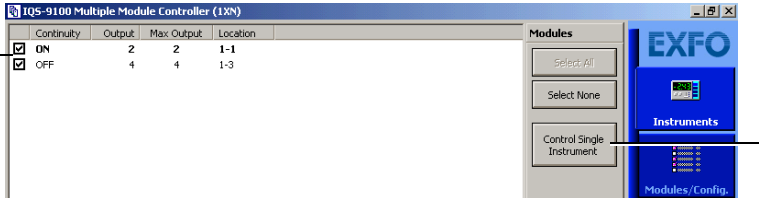
For more information on using switch controls with various optical switch models, see *Operating the Optical Switch* on page 27.

Controlling a Single IQS-9100/9100B Optical Switch

You may want to control a specific module among all the IQS-9100/9100B Optical Switch modules that you have in the system.

To control a specific IQS-9100/9100B Optical Switch:

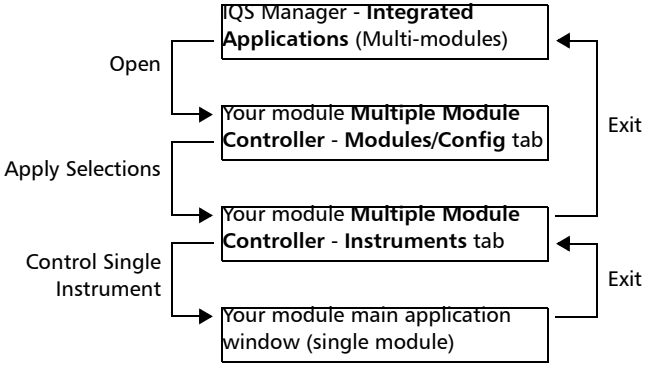
1. Make sure that the row corresponding to the module you want to control appears in bold or that it is highlighted.
2. Use the **Control Single Instrument** button to open the IQS-9100/9100B Optical Switch application.



Navigating and Closing Multiple Module Windows

When controlling multiple modules, a number of windows are open at the same time. To close a window, use the **Exit** button located under the function tabs. You will return to the preceding window.

The following diagram illustrates the navigation between windows:



5 Monitoring Optical Switch Modules

When using your IQS-9100/9100B Optical Switch module, either alone or with other modules in a test setup, you can view module data and status using its monitor window in IQS Manager.

Using Monitor Windows

Monitor windows display basic data about modules. A combination of resizable windows allows you to create an integrated data display (refer to the platform user guide).

From the monitor window, you can change module parameters either by:

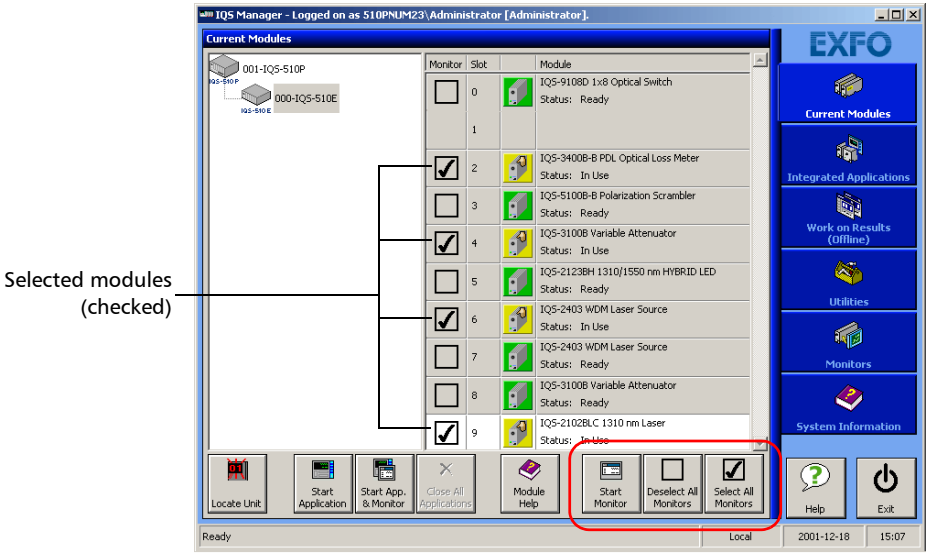
- opening the module application to access all the functions

  OR

- using the QuickTools utility, which provides frequently used functions from the application.

To select modules and display their monitor windows:

1. On the **Current Modules** function tab, select the controller or expansion unit containing the modules you want to monitor.



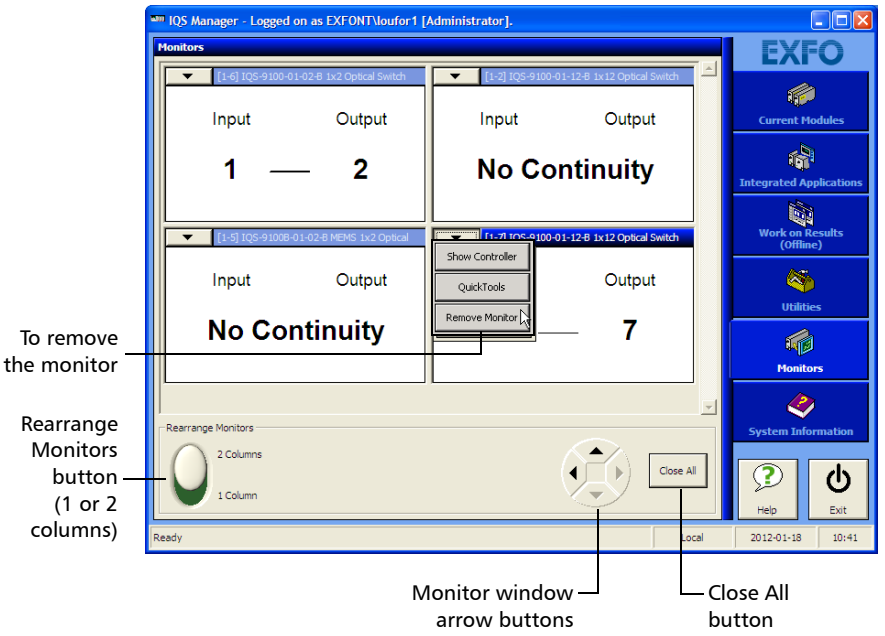
2. In the **Monitor** column, select the box next to each module you want to monitor.

If you want to monitor all the modules *in the current unit*, click **Select All Monitors**. If you want to clear your choices, click **Deselect All Monitors**.

3. Click **Start Monitor** to apply your selection.

IQS Manager will display the selected monitor windows on the **Monitors** function tab.

Note: *To start the* highlighted *module's corresponding application at the same time, click* **Start App. & Monitor**. *The application will appear in a different window.*



Using QuickTools

With QuickTools, you can fine-tune your module directly, while keeping an eye on your entire test setup.

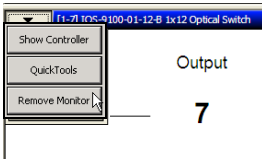
Note: *You can only access QuickTools if the module's monitor window is selected from the* **Monitors** *function tab and is currently active.*

To start QuickTools:

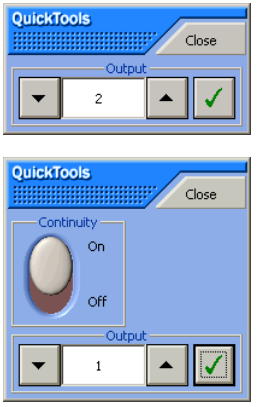
1. From the **Monitors** function tab, select the monitor window of the module you wish to control.
2. Using the arrow button in the upper left corner, select **QuickTools**.

   The corresponding monitor window flashes when QuickTools is activated.

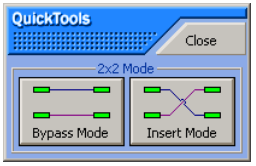
Note: *If you want to open the actual application for your module rather than QuickTools, click* **Show Controller**.



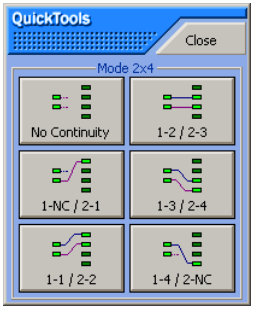
For the IQS-9100/9100B Optical Switch, one of the four QuickTools utility versions will be displayed, depending on the model of the selected module, as shown in the figure below.



1 x 2 and 1 x n optical switch model QuickTools utility



2 x 2 optical switch model QuickTools utility (IQS-9100 Optical Switch only)



2 x 4 optical switch model QuickTools utility (IQS-9100 Optical Switch only)

To control a specific optical switch with QuickTools:

Ensure that the switch window is selected (its title bar should be displayed in the same color as the sidebar buttons.)

- For 1 x n models, from the **Output** section, click the selection arrows on both sides of the list, and then click the Check ☑ button to select the port. For 2 x 2 or 2 x 4 models (IQS-9100 Optical Switch only), from the **2 x 2 Mode** or **Mode 2 x 4** section, select the appropriate port configuration (For details, see *Operating the Optical Switch* on page 27).
- If a **Continuity** switch button is displayed in the QuickTools utility, click it to activate the optical switch (For more information, see *Selecting Configurations with the 1 x n Model* on page 32).

To close QuickTools:

Click the **Close** button located at the top of the window.

OR

Click outside the QuickTools window.

To close a monitor window:

Click the button on the upper left of the monitor window and select **Remove Monitor**.

OR

Click the **Close All** button at the bottom of the window.

6 Maintenance

To help ensure long, trouble-free operation:

- Always inspect fiber-optic connectors before using them and clean them if necessary.
- Keep the unit free of dust.
- Clean the unit casing and front panel with a cloth slightly dampened with water.
- Store unit at room temperature in a clean and dry area. Keep the unit out of direct sunlight.
- Avoid high humidity or significant temperature fluctuations.
- Avoid unnecessary shocks and vibrations.
- If any liquids are spilled on or into the unit, turn off the power immediately, disconnect from any external power source, remove the batteries and let the unit dry completely.

WARNING

The use of controls, adjustments and procedures other than those specified herein may result in exposure to hazardous situations or impair the protection provided by this unit.

Cleaning Fixed Connectors

Regular cleaning of connectors will help maintain optimum performance. *Do not try to disassemble the unit. Doing so would break the connector.*

To clean fixed connectors:

1. Fold a lint-free wiping cloth in four to form a square.
2. Moisten the center of the lint-free wiping cloth with *only one drop* of isopropyl alcohol.

IMPORTANT

Alcohol may leave traces if used abundantly. Avoid contact between the tip of the bottle and the wiping cloth, and do not use bottles that distribute too much alcohol at a time.

3. Gently wipe the connector threads three times with the folded and moistened section of the wiping cloth.

IMPORTANT

Isopropyl alcohol takes approximately ten seconds to evaporate. Since isopropyl alcohol is not absolutely pure, evaporation will leave microscopic residue. Make sure you dry the surfaces before evaporation occurs.

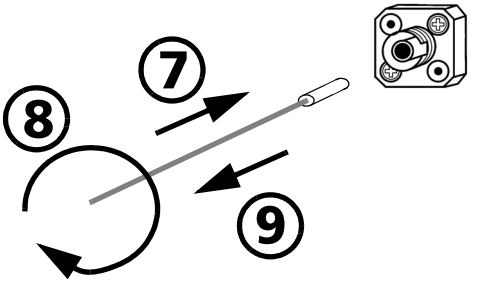
4. With a dry lint-free wiping cloth, gently wipe the same surfaces three times with a rotating movement.
5. Throw out the wiping cloths after one use.

6. Moisten a cleaning tip (2.5 mm tip) with *only one drop* of isopropyl alcohol.

IMPORTANT

Alcohol may leave traces if used abundantly. Avoid contact between the tip of the bottle and the cleaning tip, and do not use bottles that distribute too much alcohol at a time.

7. Slowly insert the cleaning tip into the connector until it reaches the ferrule inside (a slow clockwise rotating movement may help).



8. Gently turn the cleaning tip one full turn.

9. Continue to turn as you withdraw the cleaning tip.

10. Repeat steps 7 to 9, but this time with a dry cleaning tip (2.5 mm tip provided by EXFO).

Note: *Make sure you don't touch the soft end of the cleaning tip and verify the cleanliness of the cotton tip.*

11. Throw out the cleaning tips after one use.

Cleaning EUI Connectors

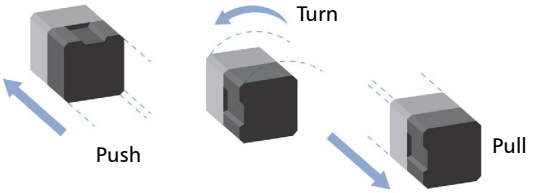
Regular cleaning of EUI connectors will help maintain optimum performance. There is no need to disassemble the unit.

IMPORTANT

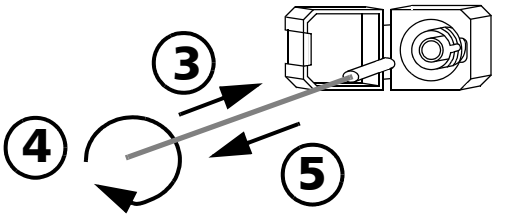
If any damage occurs to internal connectors, the module casing will have to be opened and a new calibration will be required.

To clean EUI connectors:

1. Remove the EUI from the instrument to expose the connector baseplate and ferrule.



2. Moisten a 2.5 mm cleaning tip with *one drop* of isopropyl alcohol (alcohol may leave traces if used abundantly).
3. Slowly insert the cleaning tip into the EUI adapter until it comes out on the other side (a slow clockwise rotating movement may help).



4. Gently turn the cleaning tip one full turn, then continue to turn as you withdraw it.

5. Repeat steps 3 to 4 with a dry cleaning tip.

Note: *Make sure you don't touch the soft end of the cleaning tip.*

6. Clean the ferrule in the connector port as follows:

   6a. Deposit *one drop* of isopropyl alcohol on a lint-free wiping cloth.

IMPORTANT

Isopropyl alcohol may leave residues if used abundantly or left to evaporate (about 10 seconds).

Avoid contact between the tip of the bottle and the wiping cloth, and dry the surface quickly.

   6b. Gently wipe the connector and ferrule.

   6c. With a dry lint-free wiping cloth, gently wipe the same surfaces to ensure that the connector and ferrule are perfectly dry.

   6d. Verify connector surface with a portable fiber-optic microscope (for example, EXFO's FOMS) or fiber inspection probe (for example, EXFO's FIP).

WARNING

Verifying the surface of the connector WHILE THE UNIT IS ACTIVE WILL result in permanent eye damage.

7. Put the EUI back onto the instrument (push and turn clockwise).

8. Throw out cleaning tips and wiping cloths after one use.

Recycling and Disposal (Applies to European Union Only)

For complete recycling/disposal information as per European Directive WEEE 2002/96/EC, visit the EXFO Web site at www.exfo.com/recycle.

7 Troubleshooting

Solving Common Problems

Problem	Possible cause	Recommended action
LED push button does not light up.	Power not on.	Check AC power cord and turn on the unit.
	Module is not properly inserted.	Turn off the unit, then remove and reinsert the module.
	Computer is locked up.	Reboot the unit.
	LED is burnt.	Call EXFO.
Pushing the LED push button does not open the module main window.	Computer is locked up.	Reboot the unit.
Impossible to open a window.	Too many windows are open at the same time.	Close unused windows, then try to reopen the window.
Insertion loss higher than expected.	Dirty optical connectors.	Clean all optical connectors.
	Improper wavelength selected on other instruments	Switch to the correct wavelength on all instruments being used.
Poor repeatability.	Optical source is unstable.	Wait for source to stabilize.
	—	Select **Optimize for Repeatability**.
No optical continuity.	Switch is off.	Set the **Continuity** switch to **On**.

Obtaining Online Help

An online version of the IQS-9100/9100B Optical Switch user guide is conveniently available at all times from the application.

Note: *You will also find a printable PDF version on your installation DVD.*

To access online help:

Click the **Help** button on the function bar.

Contacting the Technical Support Group

To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers. The Technical Support Group is available to take your calls from Monday to Friday, 8:00 a.m. to 7:00 p.m. (Eastern Time in North America).

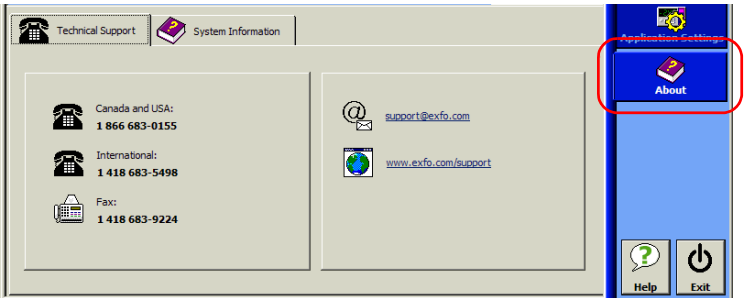
For detailed information about technical support, visit the EXFO Web site at www.exfo.com.

Technical Support Group
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

To accelerate the process, please have information such as the name and the serial number (see the product identification label), as well as a description of your problem, close at hand.

You may also be requested to provide software and module version numbers. This information, as well as technical support contact information, can be found in the **About** function tab.



- Select the **Technical Support** tab to view phone numbers and active Internet links to EXFO's Technical Support Group. Use these links to send an information request by e-mail or to access EXFO's web site.
- Select the **Module Information** tab to view the module identification, serial number and firmware version.

Transportation

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

- Pack the unit in its original packing material when shipping.
- Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shocks and vibrations.

8 Warranty

General Information

EXFO Inc. (EXFO) warrants this equipment against defects in material and workmanship for a period of two years from the date of original shipment. EXFO also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, EXFO will, at its discretion, repair, replace, or issue credit for any defective product, as well as verify and adjust the product free of charge should the equipment need to be repaired or if the original calibration is erroneous. If the equipment is sent back for verification of calibration during the warranty period and found to meet all published specifications, EXFO will charge standard calibration fees.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL EXFO BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Liability

EXFO shall not be liable for damages resulting from the use of the product, nor shall be responsible for any failure in the performance of other items to which the product is connected or the operation of any system of which the product may be a part.

EXFO shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

Exclusions

EXFO reserves the right to make changes in the design or construction of any of its products at any time without incurring obligation to make any changes whatsoever on units purchased. Accessories, including but not limited to fuses, pilot lamps, batteries and universal interfaces (EUI) used with EXFO products are not covered by this warranty.

This warranty excludes failure resulting from: improper use or installation, normal wear and tear, accident, abuse, neglect, fire, water, lightning or other acts of nature, causes external to the product or other factors beyond the control of EXFO.

Certification

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

Service and Repairs

EXFO commits to providing product service and repair for five years following the date of purchase.

To send any equipment for service or repair:

1. Call one of EXFO's authorized service centers (see *EXFO Service Centers Worldwide* on page 66). Support personnel will determine if the equipment requires service, repair, or calibration.
2. If equipment must be returned to EXFO or an authorized service center, support personnel will issue a Return Merchandise Authorization (RMA) number and provide an address for return.
3. If possible, back up your data before sending the unit for repair.
4. Pack the equipment in its original shipping material. Be sure to include a statement or report fully detailing the defect and the conditions under which it was observed.
5. Return the equipment, prepaid, to the address given to you by support personnel. Be sure to write the RMA number on the shipping slip. *EXFO will refuse and return any package that does not bear an RMA number.*

Note: *A test setup fee will apply to any returned unit that, 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, you will be invoiced for the cost appearing on this report. EXFO will pay return-to-customer shipping costs for equipment under warranty. Shipping insurance is at your expense.

Routine recalibration is not included in any of the warranty plans. Since calibrations/verifications are not covered by the basic or extended warranties, you may elect to purchase FlexCare Calibration/Verification Packages for a definite period of time. Contact an authorized service center (see *EXFO Service Centers Worldwide* on page 66).

EXFO Service Centers Worldwide

If your product requires servicing, contact your nearest authorized service center.

EXFO Headquarters Service Center
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

EXFO Europe Service Center
Omega Enterprise Park, Electron Way
Chandlers Ford, Hampshire S053 4SE
ENGLAND

Tel.: +44 2380 246810
Fax: +44 2380 246801
support.europe@exfo.com

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3rd Floor, Building 10,
Yu Sheng Industrial Park (Gu Shu Crossing), No. 467,
National Highway 107,
Xixiang, Bao An District,
Shenzhen, China, 518126

Tel: +86 (755) 2955 3100
Fax: +86 (755) 2955 3101
support.asia@exfo.com

A Technical Specifications

IMPORTANT

The following technical specifications can change without notice. The information presented in this section is provided as a reference only. To obtain this product's most recent technical specifications, visit the EXFO Web site at *www.exfo.com*.

SPECIFICATIONS [a]

Switch	1 x 2, 1 x 4	1 x 8	1 x 12	1 x 16	1 x 24, 1 x 32
Operating wavelength (nm)	1290 to 1650				
Insertion loss (dB) at 1310 nm [b, c]	0.9	1.2	1.6	1.8	2.0
Insertion loss (dB) at 1530 nm to 1650 nm [b, c]	0.7	1.0	1.2	1.4	1.5
Repeatability (dB) [d]	0.02				
Backreflection (dB) (typical)	–50 (–55)				
Crosstalk (dB) (typical)	50 (60)				
Polarization-dependent loss (dB) (typical) [e]	0.09 (0.06)			0.11 (0.08)	
Switching time (ms) [c]	20	30			
Fiber type	Singlemode 9/125 µm				
Input power (damage threshold) (dBm)	27				

GENERAL SPECIFICATIONS

Switch		1 x 2, 1 x 4	1 x 8	1 x 12	1 x 16	1 x 24, 1 x 32
Number of slots		1	2	2 [f]	3	5
Dimensions	Width	3.6 cm (1 7/16 in)	7.4 cm (2 15/16 in)	7.4 cm (2 15/16 in)	11.2 cm (4 7/16 in)	18.8 cm (7 7/16 in)
	Height	12.5 cm (4 15/16 in)	12.5 cm (4 15/16 in)	12.5 cm (4 15/16 in)	12.5 cm (4 15/16 in)	12.5 cm (4 15/16 in)
	Depth	28.2 cm (11 1/8 in)	28.2 cm (11 1/8 in)	28.2 cm (11 1/8 in)	28.2 cm (11 1/8 in)	28.2 cm (11 1/8 in)
Weight		0.8 kg (1.1 lb)	0.8 kg (1.8 lb)	1.1 kg (2.2 lb)	1.1 kg (2.2 lb)	1.8 kg (3.9 lb)
Switch life		1 billion (10^9) cycles minimum				
Temperature	operating	0 °C to 40 °C (32 °F to 104 °F)				
	storage	–40 °C to 70 °C (–40 °F to 158 °F)				
Maximum relative humidity		80 % non-condensing at 40 °C				

Instrument Drivers
LabVIEW™ drivers, SCPI commands and COM/DCOM libraries.

Remote Control
With IQS-600: GPIB (IEEE-488.1, IEEE-488.2) Ethernet and RS-232.

Standard Accessories
User guide, certificate of compliance and calibration certificate.

Notes

a. Specifications valid at 23 °C ± 5 °C.
b. Insertion losss per module, including one connector.
c. Typical specifications.
d. Repeatability values are for 100 cycles per switch module at constant temperature with stabilized source/meter.
e. At 1550 nm.
f. 1 x 12 switches with EUI connectors use three slots.

B SCPI Command Reference

This appendix presents detailed information on the commands and queries supplied with your IQS-9100/9100B Optical Switch.

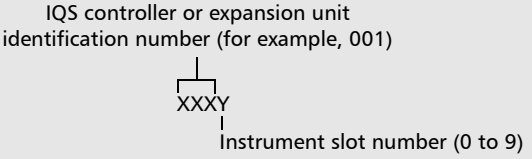
IMPORTANT

Since the IQS controllers and expansion units can house many instruments, you must explicitly specify which instrument you want to remotely control.

You must add the following mnemonic *at the beginning of any command or query* that you send to an instrument:

LINStrument<LogicalInstrumentPos>:

where *<LogicalInstrumentPos>* corresponds to the identification number of the instrument.



For information on modifying unit identification, refer to your platform user guide.

Quick Reference Command Tree

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Product-Specific Commands—Description

:ROUTe[1..n]:CLOSe	
Description	This command positions the optical switch to the reset position. In this position, there is no optical continuity. *RST has no effect on this command.
Syntax	:ROUTe[1..n]:CLOSe
Parameter(s)	None
Example(s)	ROUT:CLOSE
Notes	For all switches except: 1x2, 2x2, and 2x4.
See Also	ROUTe[1..n]:OPEN ROUTe[1..n]:OPEN:STATe?

:ROUTe[1..n]:OPEN

Description	This command makes the switch change from the reset position (no optical continuity) to the channel position in effect when the switch was turned off. *RST has no effect on this command.
Syntax	:ROUTe[1..n]:OPEN
Parameter(s)	None
Example(s)	ROUT:OPEN
Notes	For all switches except: 1x2, 2x2, and 2x4.
See Also	ROUTe[1..n]:OPEN ROUTe[1..n]:OPEN:STATe?

:ROUTe[1..n]:OPEN:STATe?

Description	This query returns a value indicating whether the switch is optically open or closed. On *RST, the value of this setting is OFF.
Syntax	:ROUTe[1..n]:OPEN:STATe?
Parameter(s)	None
Response Syntax	<OpticalContinuity>
Response(s)	*OpticalContinuity:* The response data syntax for <OpticalContinuity> is defined as a <NR1 NUMERIC RESPONSE DATA> element. The <OpticalContinuity> response represents the optical continuity state, where: 0, means there is no optical continuity. 1, means there is optical continuity.
Example(s)	ROUT:CLOS ROUT:OPEN:STAT? returns 0 (there is no optical continuity) ROUT:OPEN ROUT:OPEN:STAT? returns 1 (there is optical continuity)
Notes	For all switches except: 1x2, 2x2, and 2x4.
See Also	ROUTe[1..n]:OPEN ROUTe[1..n]:CLOSe

:ROUTe[1..n]:PATH:CATalog?

Description	This query returns a value indicating the type of switch in use (e.g. 1x2, 1x4, 1x12, 1x16, 1x 32, 2x2 or 2x4). *RST has no effect on this command.
Syntax	:ROUTe[1..n]:PATH:CATalog?
Parameter(s)	None
Response Syntax	<Type>
Response(s)	*Type:* The response data syntax for <Type> is defined as a <STRING RESPONSE DATA> element. The <Type> response is a string indicating the switch type in the format 9x99.
Example(s)	ROUT:PATH:CAT? returns "2x2"

:ROUTe[1..n]:SCAN

Description

This command sets the switch to a specific channel.

On *RST, the selected output channel depends on the switch configuration:
a) For 1xN switch configuration: Output 1.

b) For 2x4 switch configuration: no continuity for both Input 1 and Input 2.
c) For 2x2 switch configuration: BYPASS state.

Syntax

:ROUTe[1..n]:SCAN<wsp><Position>

Parameter(s)

Position:

The program data syntax for <Position> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element.

The <Position> is a number from 0 to 32, depending on switch configuration as follows:

a) For a 1xN switch configuration, a number from 1 to 32, depending on the number of output channels.

b) For a 2x4 switch, a number from 0 to 5, where
0, means no continuity for both Input 1 and Input 2.
1, means no continuity for Input 1, and Input 2 is connected to Output 1.

:ROUTe[1..n]:SCAN

	2, means Input 1 is connected to Output 1 and Input 2 is connected to Output 2. 3, means Input 1 is connected to Output 2 and Input 2 is connected to Output 3. 4, means Input 1 is connected to Output 3 and Input 2 is connected to Output 4. 5, means Input 1 is connected to Output 4 and Input 2 has no continuity. c) For a 2x2 switch, a number, 1 or 2, where: 1, means BYPASS state. 2, means INSERT state.
Example(s)	ROUT:SCAN 1 ROUT:SCAN? returns 1 ROUT:SCAN 2 ROUT:SCAN? returns 2
See Also	ROUTe[1..n]:SCAN? ROUTe[1..n]:SCAN:PREV ROUTe[1..n]:SCAN:NEXT

:ROUTe[1..n]:SCAN?

Description	This query returns a value indicating the current switch position. On *RST, the selected output channel depends on the switch configuration: a) For 1xN switch configuration: Output 1. b) For 2x4 switch configuration: no continuity for both Input 1 and Input 2. c) For 2x2 switch configuration: BYPASS state.
Syntax	:ROUTe[1..n]:SCAN?
Parameter(s)	None
Response Syntax	<Position>
Response(s)	*Position:* The response data syntax for <Position> is defined as a <NR1 NUMERIC RESPONSE DATA> element. The <Position> response represents the currently selected channel on the switch, as follows: a) For a 1xN switch configuration, a number from 1 to 32, depending on the number of output channels. b) For a 2x4 switch, a number from 0 to 5, where 0, means no continuity for both Input 1 and Input 2. 1, means no continuity for Input 1, and Input 2 is connected to Output 1.

:ROUTe[1..n]:SCAN?

	2, means Input 1 is connected to Output 1 and Input 2 is connected to Output 2. 3, means Input 1 is connected to Output 2 and Input 2 is connected to Output 3. 4, means Input 1 is connected to Output 3 and Input 2 is connected to Output 4. 5, means Input 1 is connected to Output 4 and Input 2 has no continuity. c) For a 2x2 switch, a number, 1 or 2, where: 1, means BYPASS state. 2, means INSERT state.
Example(s)	ROUT:SCAN 1 ROUT:SCAN? returns 1 ROUT:SCAN 2 ROUT:SCAN? returns 2
See Also	ROUTe[1..n]:SCAN ROUTe[1..n]:SCAN:PREV ROUTe[1..n]:SCAN:NEXT

:ROUTe[1..n]:SCAN:ADJust

Description	This command makes the switch mechanism return to a reference position before aligning to the current position. This command is an event and has no associated *RST condition or query form.
Syntax	:ROUTe[1..n]:SCAN:ADJust
Parameter(s)	None
Example(s)	ROUT:SCAN:ADJ
See Also	ROUTe[1..n]:SCAN:ADJust:AUTO ROUTe[1..n]:SCAN:ADJust:AUTO?

:ROUTe[1..n]:SCAN:ADJust:AUTO

Description

This command sets the <Optimize for repeatability> option. When this option is selected, the switch mechanism returns to a reference position before aligning to a new position. This ensures optimum repeatability. When this option is not selected, the switch mechanism goes directly to the new channel position. This provides faster switching times, but less repeatability.

On *RST, the value of this setting is OFF.

Syntax

:ROUTe[1..n]:SCAN:ADJust:AUTO<wsp><Auto Adjust>

Parameter(s)

AutoAdjust:

The program data syntax for <AutoAdjust> is defined as a <Boolean Program Data> element. The <AutoAdjust> special forms ON and OFF are accepted on input for increased readability. ON corresponds to 1 and OFF corresponds to 0.

The <AutoAdjust> parameter enables or disables the optimization for repeatability.

1 or ON, enables the optimization for repeatability.
0 or OFF, disables the optimization for repeatability.

:ROUTe[1..n]:SCAN:ADJust:AUTO

Example(s)	ROUT:SCAN:ADJ:AUTO 0 ROUT:SCAN:ADJ:AUTO? returns 0 (optimization for repeatability is not selected). ROUT:SCAN:ADJ:AUTO 1 ROUT:SCAN:ADJ:AUTO? returns 1 (optimization for repeatability is selected).
Notes	For all switches except: 1x2 and 2x2.
See Also	ROUTe[1..n]:SCAN:ADJust ROUTe[1..n]:SCAN:ADJust:AUTO?

:ROUTe[1..n]:SCAN:ADJust:AUTO?

Description	This query returns the current value of the <Optimize for repeatability> option. When this option is selected, the switch mechanism returns to a reference position before aligning to a new position. This ensures optimum repeatability. When this option is not selected, the switch mechanism goes directly to the new channel position. This provides faster switching times, but less repeatability. On *RST, the value of this setting is OFF.
Syntax	:ROUTe[1..n]:SCAN:ADJust:AUTO?
Parameter(s)	None
Response Syntax	<AutoAdjust>
Response(s)	*AutoAdjust:* The response data syntax for <AutoAdjust> is defined as a <NR1 NUMERIC RESPONSE DATA> element.

:ROUTe[1..n]:SCAN:ADJust:AUTO?

	The <AutoAdjust> response represents the current state of the <Optimize for repeatability> option, where: 1, <Optimize for repeatability> option is selected. 0, <Optimize for repeatability> option is not selected.
Example(s)	ROUT:SCAN:ADJ:AUTO 0 ROUT:SCAN:ADJ:AUTO? returns 0 (optimization for repeatability is not selected). ROUT:SCAN:ADJ:AUTO 1 ROUT:SCAN:ADJ:AUTO? returns 1 (optimization for repeatability is selected).
See Also	ROUTe[1..n]:SCAN:ADJust ROUTe[1..n]:SCAN:ADJust:AUTO

:ROUTe[1..n]:SCAN:NEXT

Description	This command moves the switch to the next position. This command is an event and has no associated *RST condition or query form.
Syntax	:ROUTe[1..n]:SCAN:NEXT
Parameter(s)	None
Example(s)	ROUT:SCAN 1 ROUT:SCAN:NEXT ROUT:SCAN? returns 2
See Also	ROUTe[1..n]:SCAN ROUTe[1..n]:SCAN? ROUTe[1..n]:SCAN:PREV

:ROUTe[1..n]:SCAN:PREV

Description	This command moves the switch to its previous position. This command is an event and has no associated *RST condition or query form.
Syntax	:ROUTe[1..n]:SCAN:PREV
Parameter(s)	None
Example(s)	ROUT:SCAN 2 ROUT:SCAN:PREV ROUT:SCAN? returns 1
See Also	ROUTe[1..n]:SCAN ROUTe[1..n]:SCAN? ROUTe[1..n]:SCAN:NEXT

:ROUTe[1..n]:SCAN:SYNChronous

Description

This command enables/disables the switch to change position synchronously or not.

Syntax

:ROUTe[1..n]:SCAN:SYNChronous<wsp><Synchronous>

Parameter(s)

Synchronous:

The program data syntax for <Synchronous> is defined as a <Boolean Program Data> element. The <Synchronous> special forms ON and OFF are accepted on input for increased readability. ON corresponds to 1 and OFF corresponds to 0.

The <Synchronous> parameter enables or disables the synchronous mode.

1 or ON, enables the synchronous mode for changing position.
0 or OFF, disables the synchronous mode for changing position.

Example(s)

ROUT:SCAN:SYNC 0
ROUT:SCAN:SYNC? returns 0
ROUT:SCAN 12
STATUS? returns BUSY (Module busy)

See Also

ROUTe[1..n]:SCAN
ROUTe[1..n]:SCAN?
ROUTe[1..n]:SCAN:SYNChronous?

:ROUTe[1..n]:SCAN:SYNChronous?

Description	This query returns a value indicating whether the switch is changing position synchronously or not. On *RST, the value of this setting is ON.
Syntax	:ROUTe[1..n]:SCAN:SYNChronous?
Parameter(s)	None
Response Syntax	<Synchronous>
Response(s)	*Synchronous:* The response data syntax for <Synchronous> is defined as a <NR1 NUMERIC RESPONSE DATA> element. The <Synchronous> response represents switching position mode, where: 0, means the module is changing position asynchronously. 1, means the module is changing position synchronously.
See Also	ROUTe[1..n]:SCAN ROUTe[1..n]:SCAN? ROUTe[1..n]:SCAN:SYNChronous

:SNUMber?

Description	This query returns a value indicating the module's serial number This command is an event and has no associated *RST condition or query form.
Syntax	:SNUMber?
Parameter(s)	None
Response Syntax	<SerialNumber>
Response(s)	*SerialNumber:* The response data syntax for <SerialNumber> is defined as a <STRING RESPONSE DATA> element. The <SerialNumber> response represents a string containing the modules serial number.
Example(s)	SNUM? returns "123456-AB"

:STATus?

Description	This query returns a value indicating the status of the switch (READY, BUSY, etc.) This command is an event and has no associated *RST condition or query form.
Syntax	:STATus?
Parameter(s)	None
Response Syntax	<Status>
Response(s)	*Status:* The response data syntax for <Status> is defined as a <CHARACTER RESPONSE DATA> element. The <Status> response represents the module state, where: UNINITIALIZED, means the module is not initialized. INITINPROGRESS, means the module initialization is in progress, READY, means the module is ready, BUSY, means the module is busy, DISCONNECTED, means the module is disconnected, DEFECTIVE, means the module is defective, and UNCONFIGURED, means the module is not configured.
Example(s)	STAT? returns READY (Module is ready.)

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NOTICE

通告

CHINESE REGULATION ON RESTRICTION OF HAZARDOUS SUBSTANCES

中国关于危害物质限制的规定

NAMES AND CONTENTS OF THE TOXIC OR HAZARDOUS SUBSTANCES OR ELEMENTS CONTAINED IN THIS EXFO PRODUCT

包含在本 **EXFO** 产品中的有毒有害物质或元素的名称和含量

O	Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
X	Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

Part Name 部件名称	Toxic or hazardous Substances and Elements 有毒有害物质和元素					
	Lead 铅 (Pb)	Mercury 汞 (Hg)	Cadmium 隔 (Cd)	Hexavalent Chromium 六价铬 (Cr VI)	Polybrominated biphenyls 多溴联苯 (PBB)	Polybrominated diphenyl ethers 多溴二苯醚 (PBDE)
Enclosure 外壳	O	O	O	O	O	O
Electronic and electrical sub-assembly 电子和电子组件	X	O	X	O	X	X
Optical sub-assembly[a] 光学组件 [a]	X	O	O	O	O	O
Mechanical sub-assembly[a] 机械组件 [a]	O	O	O	O	O	O

a. If applicable.
如果适用。

MARKING REQUIREMENTS
标注要求

Product 产品	Environmental protection use period (years) 环境保护使用期限 (年)	Logo 标志
This Exfo product 本 EXFO 产品	10	
Battery[a] 电池 [a]	5	

a. If applicable.
如果适用。

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