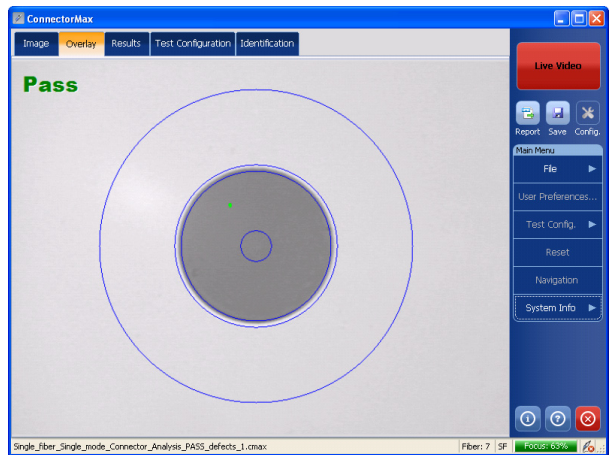

FIP-400

Fiber Inspection Probe and ConnectorMax



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Units of Measurement

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

Version number: 6.0.0

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Certification Information

North America Regulatory Statement

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

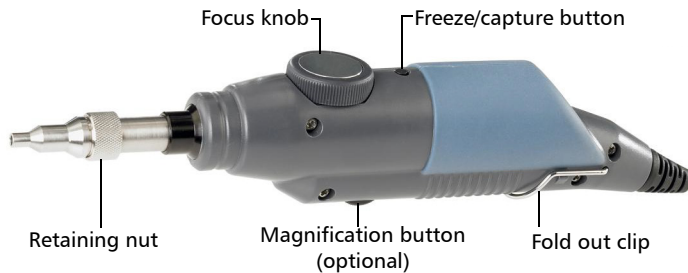
An electronic version of the declaration of conformity for your product is available on our website at www.exfo.com. Refer to the product's page on the Web site for details.

1 Introducing the FIP-400 Fiber Inspection Probe and ConnectorMax

The FIP-400 Fiber Inspection Probe is a portable video microscope used to inspect fiber ends. Unlike traditional microscopes, the FIP-400 facilitates the examination of patchcord connectors and also hard-to-reach connectors on the back of patch panels and bulkhead adapters.

Probe

The FIP-400 is designed to be an intuitive, easy-to-use piece of equipment. This video microscope is used for inspecting fiber ends.



- The *focus knob* can be turned in either direction to focus the image.
- The *magnification button* allows you to shift between two levels of magnification.
- The *freeze/capture button* is used together with the EXFO USB adapter and your unit or computer. It allows you to capture an image, perform an analysis, save a file or return to the Live video mode.
- The *retaining nut* holds tips securely in place, ensuring they are always fastened in the correct position.
- The *fold out clip* at the back of the probe allows you to hang the probe when you are not using it.

The probe comes equipped with a protective cap that fits over basic tips; therefore, you do not need to remove the tip before putting the cap on.

Probe Tips

The FIP-400 comes with two interchangeable tips but other models are also available.

The tips included with the Fiber Inspection Probe are used to inspect flat polish (PC) 2.5 mm connectors. One tip is for inspecting patchcords (pigtailed, male connectors) for SC, FC, and ST connectors. The other tip is for examining SC and FC bulkhead adapters or patch panel adapters (female).

Other tip models are available for various bulkhead adapters and patchcord connectors including multifiber types. For more information about tips and their use, see *Fiber Inspection Probe Tip Compatibility Chart* on page 65, or visit the EXFO Web site.

FIP Viewer (Optional)

You can use the FIP Viewer with your Fiber Inspection Probe to inspect a fiber end. The unit operates with an AC charger/adaptor or a lithium-ion battery.



IMPORTANT

The FIP Viewer is a standalone unit and does not work with ConnectorMax.



Introducing the FIP-400 Fiber Inspection Probe and ConnectorMax

FIP Viewer (Optional)

The two LEDs located on the front of the FIP Viewer provides you with the status of your unit.

Operation status LED

LED	Status
Green	Probe connected
Flashing red	Probe not connected

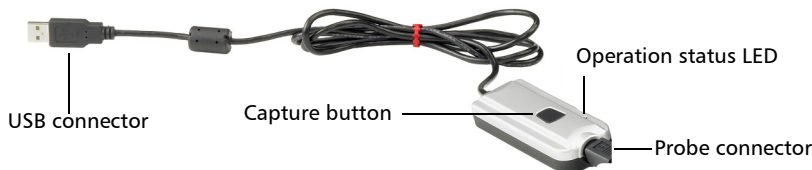
Battery status LED

LED	Status
Green	Full battery and AC charger/adaptor connected
Flashing green	Charging battery
Yellow	Low battery
Red	Battery error

Note: *If the battery is not full, the AC charger/adaptor can support the operation and charge the battery at the same time.*

USB Adapter (Optional)

The USB adapter is used to connect the probe to a computer not equipped with a 8-pin connector. It allows you to view probe images on your computer screen. You can also capture and store these images on your computer to document your work.



- The *Capture button* on the USB adapter serves the same function as the capture button on the probe.
- The Status *LED* on the USB adapter will be green when the probe, USB adapter, and computer are connected and the software is running.



IMPORTANT

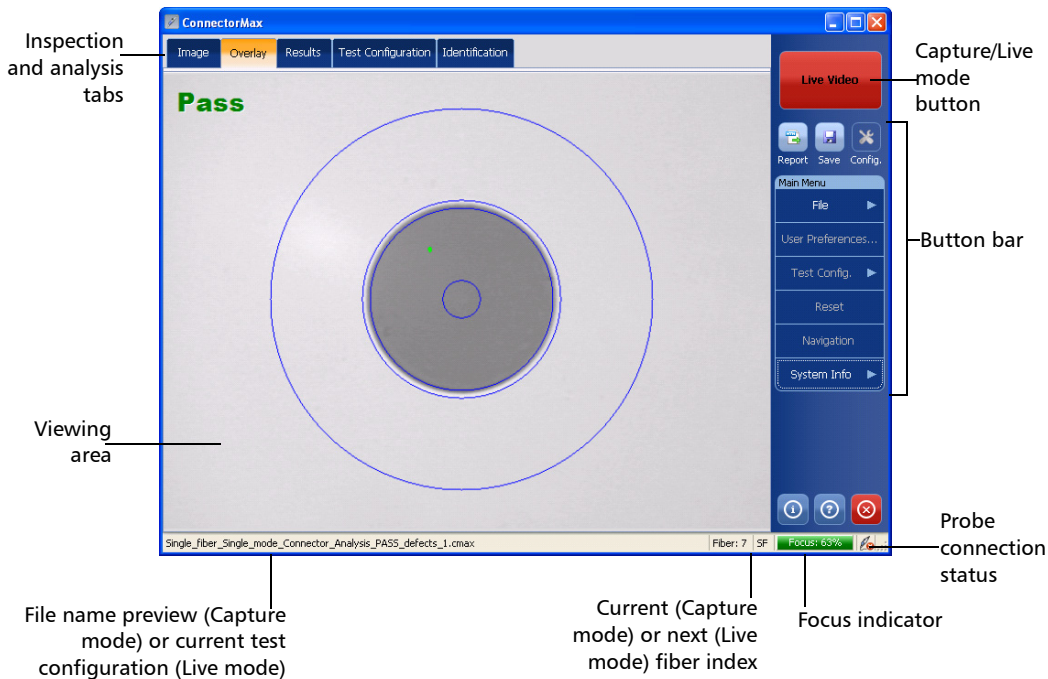
The product supports **USB 2.0** only. You cannot use it with **USB 1.1**.

Introducing the FIP-400 Fiber Inspection Probe and ConnectorMax

ConnectorMax Software

ConnectorMax Software

ConnectorMax is the application used to view the fiber inspections. If you have purchased the corresponding option, you can also use specific test configurations and analyze the fibers automatically upon capturing a picture.



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.

Note: *The screen shots found in this user guide were made on a computer running Microsoft Windows XP. The appearance of the application may vary for other operating systems and platforms.*

2 **Safety Information**



WARNING

- Use only the listed and certified AC adapter/charger provided by EXFO with your unit. It provides reinforced insulation between primary and secondary, and is suitably rated for the country where the unit is sold.
- Use only accessories (such as the car outlet adapter, batteries, and fiber inspection probe) designed for your unit and approved by EXFO. For a complete list of accessories available for your unit, refer to its technical specifications.
- When you use the unit outdoors, ensure that it is protected from liquids, dust, direct sunlight, precipitation, and full wind pressure.



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, namely for operation and maintenance, other than those specified herein may result in hazardous radiation exposure 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.



IMPORTANT

Other safety instructions relevant for your product are located throughout this documentation, depending on the action to perform. Make sure to read them carefully when they apply to your situation.











CAUTION

EXFO guarantees the specifications and viability of the products *ONLY* if they are used with chargers and batteries provided by EXFO.

Other Safety Symbols on Your Unit

One or more of the following symbols may also appear on your unit.

Symbol	Meaning
	Direct current
	Alternating current
	Both direct and alternating current
	The unit is equipped with an earth (ground) terminal.
	The unit is equipped with a protective conductor terminal.
	The unit is equipped with a frame or chassis terminal.
	On (Power)
	Off (Power)

Electrical Safety Information

If you need to ensure that the unit is completely turned off, disconnect the power cable and remove the battery.

Safety Information

Electrical Safety Information

Equipment Ratings	
Temperature	➤ Battery operated: -10 °C to 50 °C (14 °F to 122 °F)
➤ Operation	➤ Charge mode: -10 °C to 40 °C (14 °F to 120 °F)
➤ Storage	➤ -40 °C to 70 °C (-40 °F to 158 °F)
Relative humidity	unit: ≤ 95 % non-condensing
Maximum operation altitude	2000 m (6562 ft)
Pollution degree	➤ 2 (unit connected to external power supply) ^a ➤ 3 (unit operated from batteries) ^b
Overtoltage category	➤ unit: I ➤ AC adapter: II
Measurement category	Not rated for measurement categories II, III or IV
Power supply rating	--- 9 V; 1 A

a. Use the external power supply indoors only.

b. Equipment should be normally protected against exposure to direct sunlight, precipitations and full wind pressure.

3 **Setting up Your Fiber Inspection Probe and ConnectorMax**

You can change various settings in ConnectorMax such as the brightness and contrast levels, default storage location, or automated file name. These settings are stored for each user and kept for future work sessions.

Changing the Fiber Inspection Probe Tip

You can use various tips depending on the type of connector you are inspecting. For more information about tips you can use, visit the EXFO Web site at www.exfo.com.



To change a tip:

- 1.** Untighten the tip's retaining nut.
- 2.** Remove the tip.
- 3.** Insert a new tip.
- 4.** Adjust the tip to the notch.
- 5.** Retighten the retaining nut.

Setting up Your Fiber Inspection Probe and ConnectorMax

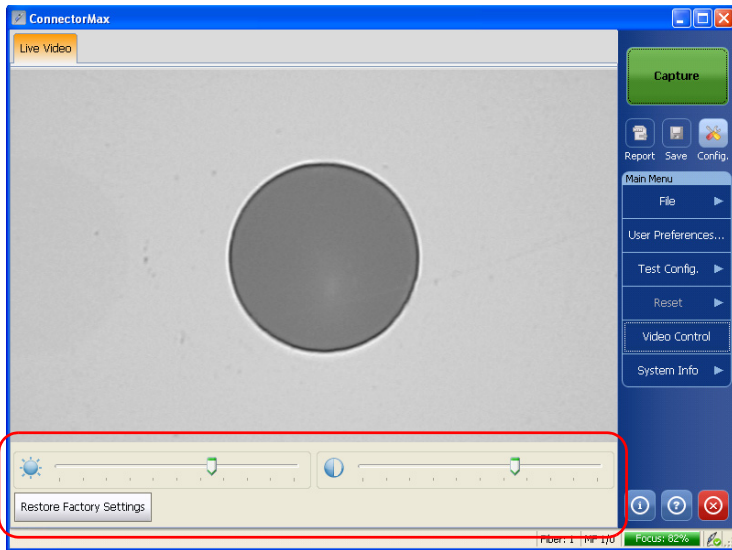
Adjusting Brightness and Contrast

Adjusting Brightness and Contrast

Once the probe is connected to a fiber, you can adjust brightness and contrast in order to better view the fiber under inspection.

To adjust brightness or contrast:

1. From the main window, click **Video Control**.
2. Use the contrast and brightness sliders at the bottom of the viewing area to set the levels to suit your needs.



3. Click **Video Control** again to exit the menu. The menu will close by itself after 10 seconds of inactivity.


Selecting the Mode of Operation

ConnectorMax can be used to inspect single-fiber (SF) and multiple-fiber (MF) connectors. Depending on which mode of operation you select, different options will be available.

Note: *The multiple-fiber connector option is only available if you have purchased this option.*

Note: *The mode of operation is kept in memory when you exit the application.*

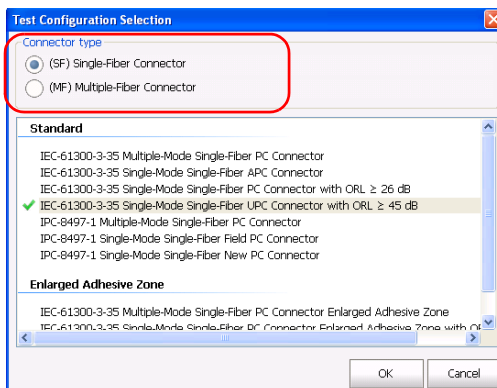
To select the mode of operation:

1. From the main window, click the  button.

OR

Select the **Test Config.** tab, then **Select.**

2. Select the connector type that suits your needs. The test configuration selection window is automatically updated accordingly.



Setting up Your Fiber Inspection Probe and ConnectorMax

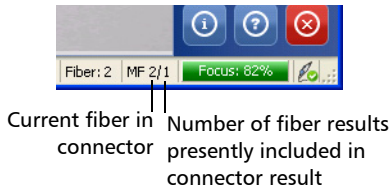
Setting up Autonaming

3. If you are testing single-fiber connectors and have purchased the analysis option, you can also select a test configuration at this point.
4. Click **OK** to close the window.

At the bottom of the main window, you can see what mode is currently active.



Single-Fiber Connector



Multiple-Fiber Connector

Setting up Autonaming

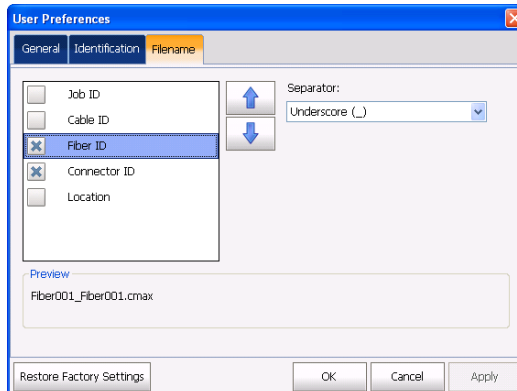
The autonaming feature is useful to make a relevant naming scheme for your tests. This also ensures that you do not overwrite files by mistake. You can select which item goes in the file name, as well as the type of separator you want to use in between.

A preview is available to show you the final output of the file name.

Note: *When in multiple-fiber mode, the scheme is only editable prior to the first acquisition; afterwards, it is available as read-only until you have completed the inspection for the set number of fibers. If the Fiber ID item is selected for the autonaming scheme, the file name will display both the start and end fiber number values.*

To set the autonoming scheme:

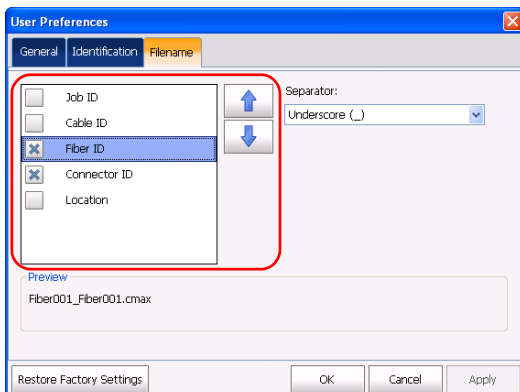
1. From the main window, select **User Preferences**.
2. Select the **Filename** tab.



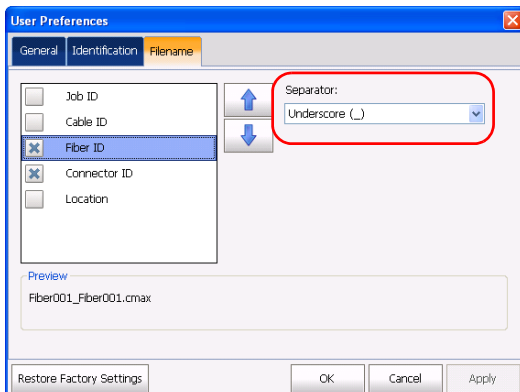
Setting up Your Fiber Inspection Probe and ConnectorMax

Setting up Autonaming

3. Select which items you want to include in the file name. The order of the items in the name goes from top to bottom; use the up- and down-arrow buttons to change the order.



4. Select a separator for the items in the list.



5. Click **Apply** to confirm your choice and continue working in the **User Preference** window, or **OK** to confirm your choice and close the window.

The new settings will apply the next time you perform a capture.

Identifying Fibers

ConnectorMax allows you to add information to your fiber inspection so that your analysis is relevant and complete. Such information can be either preset so that all of the analyses bear the same, or you can edit or add it after the capture for a specific file.

Some of the items in the identification page can be customized to better reflect your testing needs. However, as this is not directly part of the application, you must change it manually. The items you can customize are the following:

- Cable ID.
- Fiber ID.
- Connector ID.
- Location.

Note: *Should you change the user interface language after modifying the items, the latter will not be automatically translated; you will have to change the items yourself into the new language.*

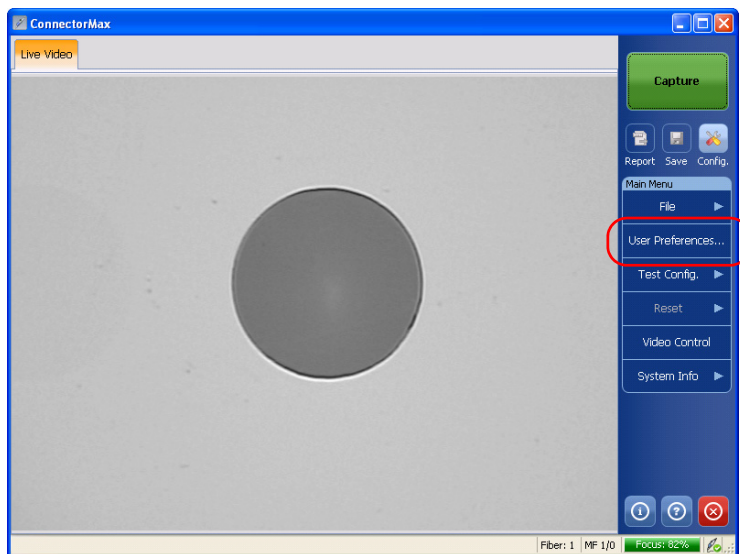
Note: *When in multiple-fiber mode, the information is only editable prior to the first acquisition; afterwards, it is available as read-only until you have completed the inspection for the set number of fibers. The information will be the same for all of the fibers in the connector, except for the Fiber ID, which will follow the connector currently tested.*

Setting up Your Fiber Inspection Probe and ConnectorMax

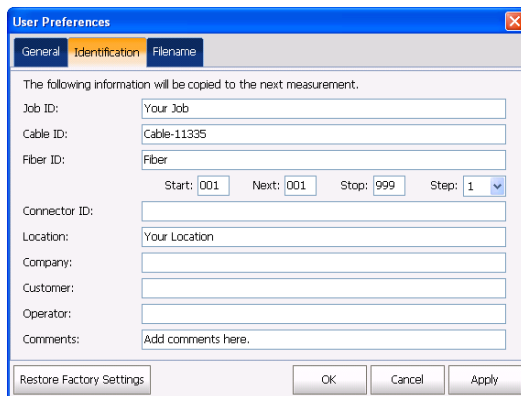
Identifying Fibers

To add information to the fibers:

1. From the main window, select **User Preferences**.



2. Select the **Identification** tab.



The screenshot shows a 'User Preferences' dialog box with three tabs: 'General', 'Identification', and 'Filename'. The 'Identification' tab is selected. The dialog contains the following fields and controls:

- Job ID:
- Cable ID:
- Fiber ID:
- Start: Next: Stop: Step: (dropdown arrow)
- Connector ID:
- Location:
- Company:
- Customer:
- Operator:
- Comments:

At the bottom of the dialog are four buttons: 'Restore Factory Settings', 'OK', 'Cancel', and 'Apply'.

3. Fill out the boxes with the desired information. The identification will increment the file name automatically using the step size you select.

In multiple-fiber connector mode, the start and stop values can be used to indicate the number of fibers in the connector. The application will prompt you to save the acquisition after you have reached the stop number value.
4. Click **Apply** to confirm your choice and continue working in the **User Preference** window, or **OK** to confirm your choice and close the window.

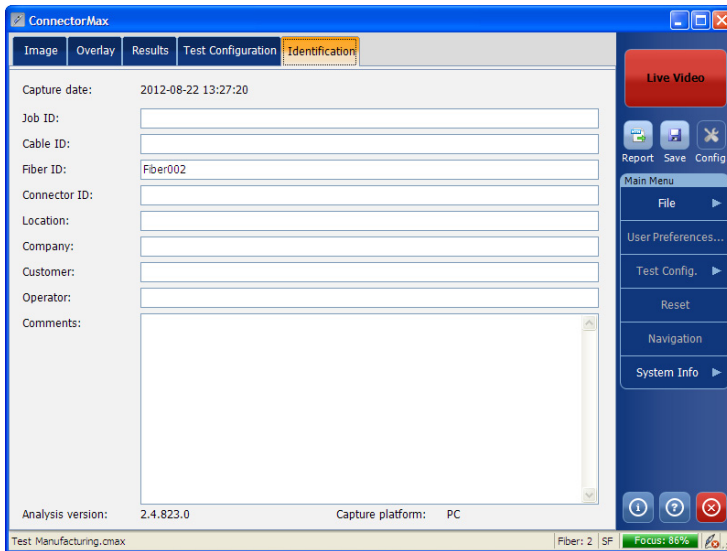
Setting up Your Fiber Inspection Probe and ConnectorMax

Identifying Fibers

To change fiber information once you have made a capture:

From the main window, select the **Identification** tab and enter the information. The details that you have added from the **User Preferences** window will already appear on-screen.

Note: *In single-fiber connector mode, if you change items in the file name identification, you will notice that the name at the bottom of the window is automatically updated. This automated update is active until you save the file and set the few file ID info.*



Note: *The analysis version and the capture platform are indicated at the bottom of the tab.*

To customize the identification items:

1. Depending on the unit onto which you are working, locate the configuration file:
 - *In Windows XP on a computer or on an FTB-500 platform:*
C:\Documents and Settings\All Users\Application Data\EXFO\ConnectorMax\Custom Fields.
 - *On an FTB-1 or FTB-200 v2 unit:* D:\Documents and Settings\All Users\Application Data\EXFO\ConnectorMax\Custom Fields.
 - *In Windows Vista and 7 on a computer:*
C:\ProgramData\Exfo\ConnectorMax\Custom Fields
2. Open the file using a text editor that supports Unicode UTF-16 encoding.
3. Modify the four identifiers to reflect the desired changes. You can set them to be visible or not as well.

The identifiers are limited to 15 characters. Special characters (? / < > " : * | \) are not supported.

The identification item Fiber ID is set to have auto-increment attributes. You can change the start, step and stop values as well. The start and stop values must be a number between 1 and 999, and the step value must be a number between -2 and 2.

Note: *The text is case-sensitive and will appear as you write it on-screen.*

4. Save and close the configuration file.



IMPORTANT

Make sure that the file is saved using a unicode UTF-16 encoding. Otherwise, it will be considered as damaged or corrupt if it contains accents or culture-specific characters.

The changes will be effective the next time you open ConnectorMax.

Setting up Your Fiber Inspection Probe and ConnectorMax

Managing and Selecting Test Configurations (Optional)

To revert to the factory identification settings:

Delete the .xml configuration file.

Note: *A new .xml file with the default settings will be created the next time you start the application.*

Managing and Selecting Test Configurations (Optional)

If you have purchased the analysis portion of ConnectorMax, you can create and select specific test configurations according to the type of fiber you are analyzing, the connector type or the type of defect you are looking for.

Note: *If you have purchased the analysis option, some test configurations as per IEC 61300-3-35 and IPC 8497-1 standards, and other configurations with an enlarged C zone are available by default.*

Creating custom test configurations is done through duplicating an existing configuration, and then modifying the desired criteria.

If you create configurations on one unit or computer, and want to transfer them to another unit or computer, you can do so. However, this feature is not included directly in ConnectorMax, and you must proceed outside the application.

Setting up Your Fiber Inspection Probe and ConnectorMax

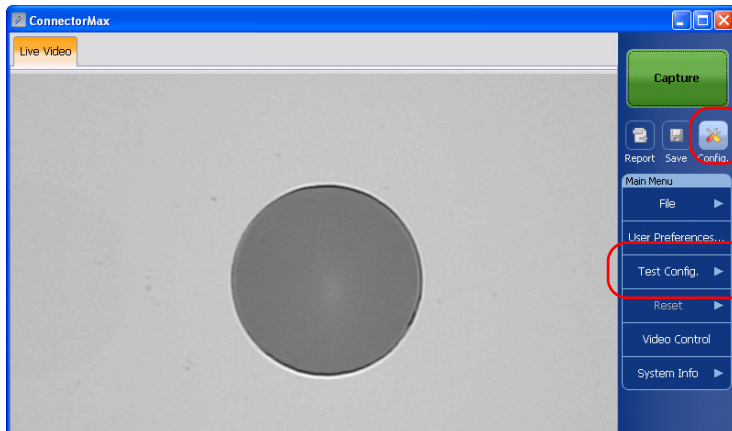
Managing and Selecting Test Configurations (Optional)

To select a test configuration:

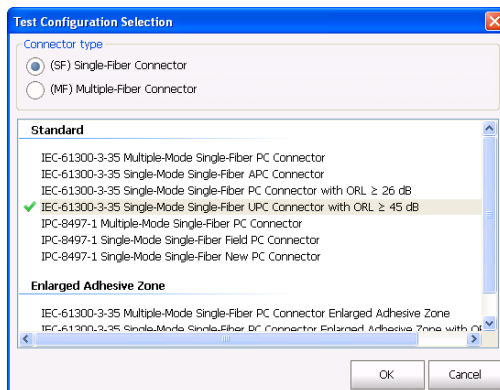
1. From the main window, select **Test Config**, then **Select**.

OR

Click .



2. In the list of available test configurations, select the one you want to use and click **OK**.

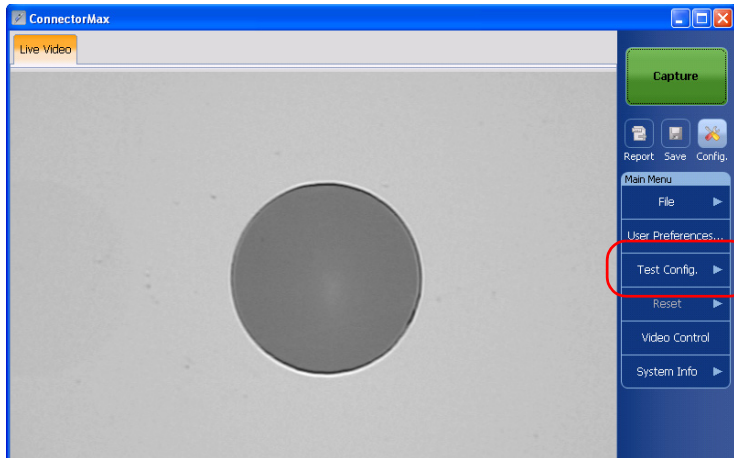


Setting up Your Fiber Inspection Probe and ConnectorMax

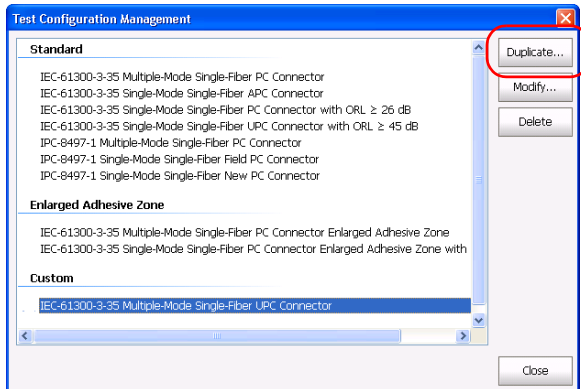
Managing and Selecting Test Configurations (Optional)

To create a test configuration:

1. From the main window, select **Test Config**, then **Manage**.



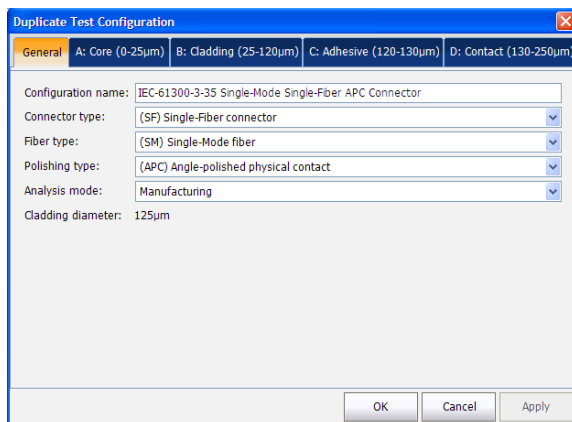
2. Select the configuration that is the closest to the one you want to create, then click **Duplicate**.



Setting up Your Fiber Inspection Probe and ConnectorMax

Managing and Selecting Test Configurations (Optional)

3. In the **General** tab, modify the criteria as needed.
 - *Configuration name:* the application suggests a name for the configuration. You can change it as needed (maximum 100 characters), but if you select a name that already exists, a suffix will automatically be added so as not to overwrite files.
 - *Connector type:* select which type of connector you are using for your inspection.
 - *Fiber type:* Select whether you are inspecting singlemode or multimode fibers.
 - *Polishing type:* Select the type of polishing for the fibers between APC, PC or UPC.
 - *Analysis mode:* Select the type of analysis between Outside plant (selected by default) and Manufacturing. The manufacturing mode is more sensitive for scratches and defects detection.
 - *Cladding diameter:* This value is set at 125 μm and cannot be modified.



Setting up Your Fiber Inspection Probe and ConnectorMax

Managing and Selecting Test Configurations (Optional)

- Under the various layer tabs, indicate whether you want to be notified of scratches, defects or both for each zone in the fiber, then set thresholds for each item you select.

You can set up to 3 criteria per zone, and per anomaly type (scratches or defects). The thresholds are divided into three categories:

- Any: this enables the next criterion, which requires a specific value.
- 1 to 10: the next criterion is automatically filled out to show the infinity symbol (∞) and 0 as a threshold.
- 0: the criterion definition is complete.

Note: Zone C, as well as zone dimensions cannot be modified, as they are set as per IEC and IPC recommendations.

Criteria	Thresholds
<input checked="" type="checkbox"/> Activate scratches	
0µm ≤ size < 4 µm	any
4µm ≤ size < ∞ µm	0
-	-
<input checked="" type="checkbox"/> Activate defects	
0µm ≤ size < 5 µm	4
5µm ≤ size < ∞ µm	0
-	-

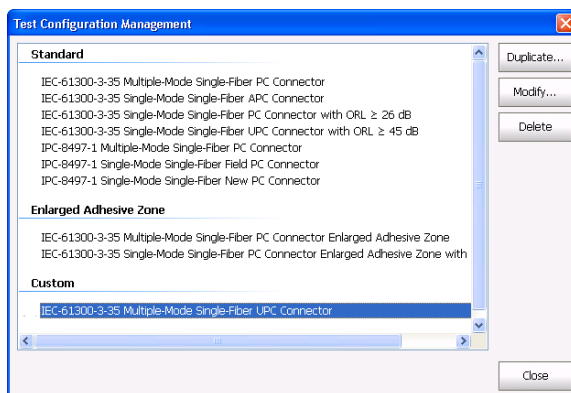
- Click **Apply** to confirm your choice and continue working in window, or **OK** to confirm your choice and close the window.

Setting up Your Fiber Inspection Probe and ConnectorMax

Managing and Selecting Test Configurations (Optional)

To edit a test configuration:

1. From the main window, select **Test Config**, then **Manage**.



2. Select the configuration you want to edit, then click **Modify**.

Note: *You cannot edit standard or enlarged adhesive zone configurations.*

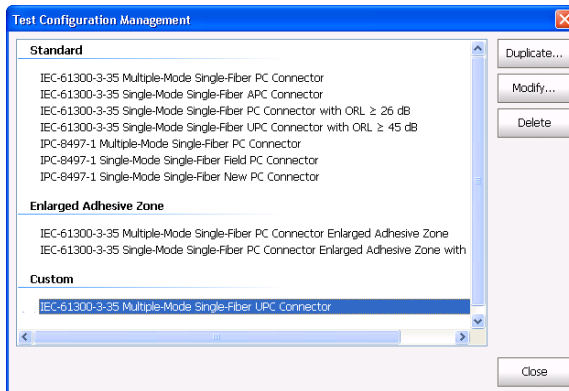
3. Change the criteria as required. For details, see the section on creating a test configuration.

Setting up Your Fiber Inspection Probe and ConnectorMax

Managing and Selecting Test Configurations (Optional)

To delete a test configuration:

1. From the main window, select **Test Config**, then **Manage**.



2. Select the configuration you want to remove, then click **Delete**.

Note: *You cannot delete standard or enlarged adhesive zone configurations.*

To transfer test configurations from one unit or computer to another:

1. Using Windows Explorer, on the unit where the custom configurations are located, select which files you want to transfer. The files are located in different folders depending on the unit you are using.
 - *In Windows XP on a computer, or on an FTB-500 platform:* C:\Documents and Settings\All Users\Application Data\EXFO\ConnectorMax\Test configuration files\Custom.
 - *In Windows Vista or 7 on a computer:* C:\ProgramData\Exfo\ConnectorMax\Test configuration files\Custom.
 - *On an FTB-1 or FTB-200 v2 unit:* D:\Documents and Settings\All Users\Application Data\EXFO\ConnectorMax\Test configuration files\Custom.
2. If the two units are linked through a network and that you have access, you can paste the files directly into the corresponding folder of the destination unit. Otherwise, copy the files onto a USB key, then paste the files in the destination folder once you have.

Reverting to Factory Settings

At any time in the application, you can revert to factory settings in your menus. However, the **Restore Factory Settings** button is valid only for the window or tab where you use it.

4 **Inspecting Fiber Ends**

Viewing the fiber inspection is done using ConnectorMax. You can start the application before or after connecting the probe, and the view on-screen will be automatically updated.

To start the application:

- On a computer, double-click the ConnectorMax icon on your desktop or select **Start > Programs > EXFO > ConnectorMax**.
- On an FTB-500, from the main window, select the **Fiber Inspection Probe** function tab, or under the **Applications** tab, select **ConnectorMax**. You can also use the direct Windows shortcut **Start > Programs > EXFO > Programs > ConnectorMax**.
- On an FTB-200 v2, select the **Probe** button in the Compact ToolBox main window.
- On an FTB-1, from the main window, select the **Probe** button, or under the **Utilities** tab, select **ConnectorMax**. You can also use the direct Windows shortcut **Start > Programs > EXFO > Programs > ConnectorMax**.

The fiber under test appears on-screen.

Note: *The screen size will adapt automatically to the unit you are using.*

To exit the application:

1. Click .
- OR
2. From the **File** menu, select **Exit**.



WARNING

Never look directly into a live fiber. It could cause serious eye damage. Always use your FIP-400 Fiber Inspection Probe.

Inspecting Fiber Ends with the FIP Viewer

You can connect the Fiber Inspection Probe to the FIP Viewer to view and inspect fiber ends.



WARNING

Never look directly into a live fiber. It could cause serious eye damage. Always use your FIP-400 Fiber Inspection Probe.



IMPORTANT

The battery in the FIP Viewer must be fully charged before the first use. For more information, see *Charging the Battery in The FIP Viewer* on page 52.

To inspect fiber ends:

1. Install a probe tip (see *Changing the Fiber Inspection Probe Tip* on page 13).
2. Insert the fiber into the probe tip.
3. Connect the probe to the FIP Viewer.
4. Press the On/Off button for approximately 2 seconds to turn on the FIP Viewer.
5. Adjust the image to have the best view of the fiber end.
6. If the fiber end is dirty, remove it from the probe, clean it and reinspect it.
7. Once you are satisfied with the inspection, go to the next fiber or turn off the FIP Viewer.

Inspecting Fiber Ends with ConnectorMax

When you connect the Fiber Inspection Probe to your unit (or computer via a USB adapter) you can view and inspect fiber ends right away. This direct viewing mode is known as the *Live* mode.

To inspect fiber ends in live mode:

- 1.** Install a probe tip (see *Changing the Fiber Inspection Probe Tip* on page 13).
- 2.** Insert the fiber into the probe tip.
- 3.** Connect your Fiber Inspection Probe to the USB video adapter, and then connect the USB video adapter to your unit.
- 4.** Start ConnectorMax if it is not already started.
- 5.** Adjust the image focus to have the best view of the fiber end.
- 6.** If the fiber end is dirty, remove it from the probe, clean it and reinspect it.
- 7.** Once you are satisfied with the inspection, go to the next fiber or turn off the unit.

Inspecting Fiber Ends

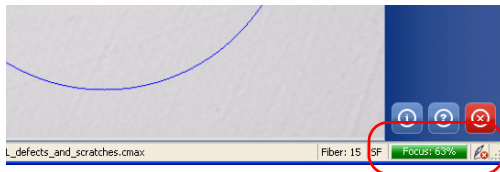
Capturing Images

Capturing Images

You can capture images of your inspections to include in reports, or save them for future analyses. This is known as the *Capture* mode.

Note: *Capturing an image with the dongle or the probe handset button automatically brings ConnectorMax at the front of the screen if you have more than one application running on your unit or computer.*

The focus indicator in the status bar indicates whether the current view is optimized for a capture. A green indicator shows a picture that can be captured and analyzed. Analysis will be more difficult with a yellow indicator, and impossible with a red indicator.



To capture an image of the fiber under inspection:

From the main window, when in high magnification level, press **Capture**.

OR

Press the Fiber Inspection Probe handset button

OR

If you are capturing the acquisition from a computer, press the button on the dongle located between the probe and the computer.

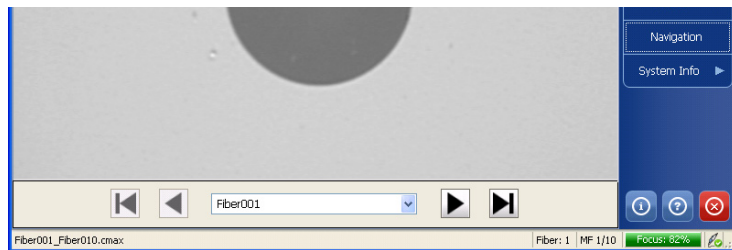
In single-fiber connector mode, if the autosaving features are enabled, your capture is stored in the default folder. If not, you will be prompted to save the acquisition before you go to the next one.

In multiple-fiber connector mode, continue capturing files until you have reached the number set in the user preferences. At the end of the capture, you will be prompted to save your file. You can also save the file at any time, even if you have not reached the maximum incremental value set.

While capturing the files, you can browse through the acquisitions you have made. You will notice that the **Video Control** button becomes a **Navigation** button.

To browse through the multiple-fiber connector acquisitions:

1. From the main window, click the **Navigation** button.
2. Use the arrow buttons to browse through the acquired files, or use the drop-down menu to go directly to a specific acquisition.



Inspecting Fiber Ends

Retesting a Fiber

Retesting a Fiber

Sometimes, a capture will show a fail status, but it could only be because the fiber is dirty and you want to clean it and test it again. However, if you have saved the file, the next capture you take will be incremented instead of replacing the current file.

In order to avoid this incrementation and end up with unwanted files, you can test a fiber again.

In single-fiber connector mode, retesting a fiber is only possible on the most recent capture. In multiple-fiber connector mode, you can reset a specific fiber within the capture, or reset the whole connector.

To retest a fiber:

1. After the capture, return to the Live mode.
2. From the main window, click **Reset**.



3. If you are in multiple-fiber mode, select whether you want to reset a specific fiber, or the whole connector. If you reset a specific fiber, select it in the provided list.
4. Capture the file again.

Note: *The reset function will only become available again in the main window once you save your file (single-fiber test mode only).*

Saving Files

In capture mode, you can save the acquisition files manually for future reference.

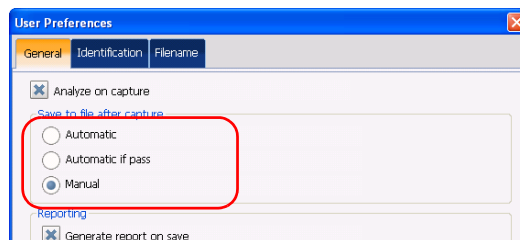
If you have purchased the analysis option you can also set ConnectorMax so that it saves the capture automatically regardless of the result, or automatically when the result is Pass only.


Note: When you return to the live mode, your file name structure will be automatically incremented so that you do not overwrite your work.

Note: In multiple-fiber connector mode, the option is set automatically to Manual and you cannot change it.

To save files automatically or automatically when the status is set to Pass:

1. From the main window, select **User Preferences**.
2. Select the **General** tab.
3. Select whether you want the capture to be automatically saved regardless of the result, saved if the result of the analysis is pass, or select the manual save option if you only want to save specific files.




4. If you want to change the default location where the files will be saved, you can do so by using the  button.
5. Click **Apply** to confirm your choice and continue working in the window, or **OK** to confirm your choice and close the window.

Inspecting Fiber Ends

Saving Files

To save a file:

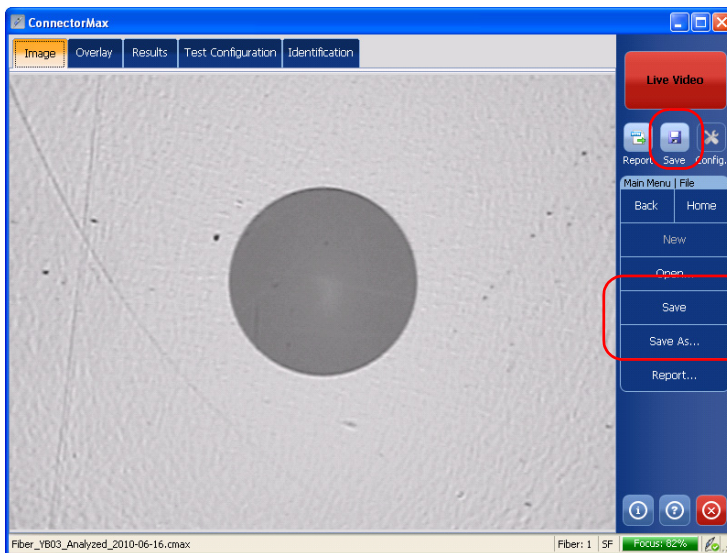
From the main window, click the  button.

OR

Select the **File** menu, then **Save** to overwrite an existing file.

OR

Select the **File** menu, then **Save As** to change the file name or location.



Note: *If you change the location for saving the files, this location will remain as the default location for the remainder of the work session, or until you change the location again.*



IMPORTANT

If you have enabled the Generate report on save option, the new report file will automatically overwrite the old one without notifying you.

Opening and Closing Files

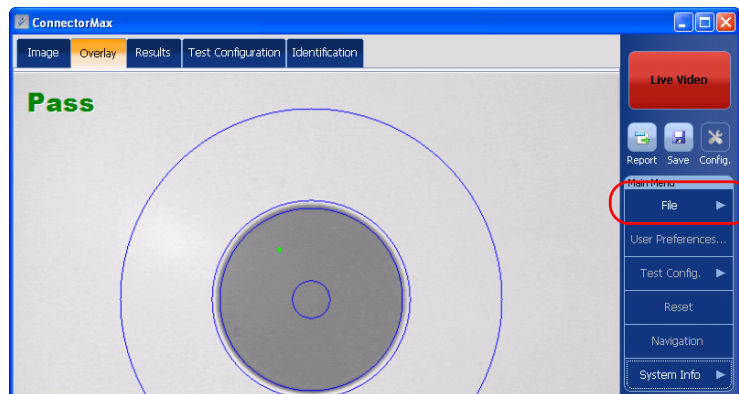
You can open captured files directly from the application to view them. You can either open current .cmax files, or a legacy image file taken from a previous fiber inspection.

Note: The accepted image formats for legacy files are .bmp, .jpg and .gif.

Note: Sample files for both single-fiber and multiple-fiber test modes are available under the folder where ConnectorMax was installed, under a folder named UserSamples.

To open a file:

1. From the main window, select **File**, and then **Open**.



2. Select the desired file, and then click **Open**.

If you are opening a multiple-fiber connector file, you can browse through the individual files using the **Navigation** button.

Note: If you are in a file browser, you can also double-click on the file to open it in ConnectorMax. Double-clicking on a legacy file will open the application currently associated with this file format.

Inspecting Fiber Ends

Analyzing Captures (Optional, Single-Fiber Connector Mode Only)

Analyzing Captures (Optional, Single-Fiber Connector Mode Only)

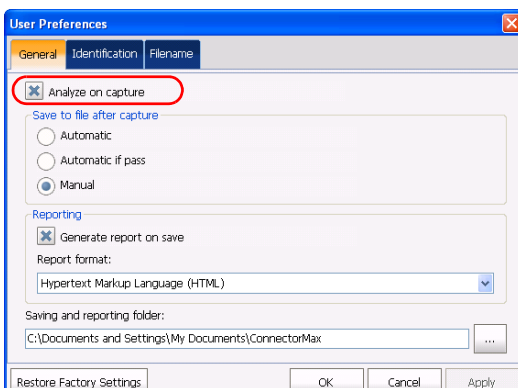
If you have acquired the capture analysis tool, it will be available in ConnectorMax for you to perform automated pass/fail analyses according to the criteria you have set.

The analysis option enables all of the tabs in the viewing area, whereas the inspection-only option only enables the **Image** and **Identification** tabs.

Note: On units that allow it (FTB-500, FTB-200 v2), you will notice that the Pass/Fail LED will indicate the analysis result as you capture files.

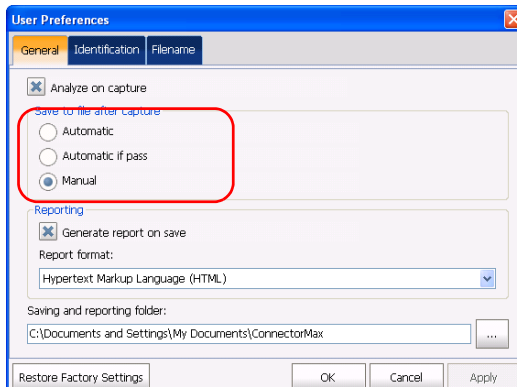
To enable the analysis tool:

1. From the main window, select **User Preferences**.
2. Under the **General** tab, select **Analyze on capture**.



3. Select whether you want the analysis to be automatically saved if the result of the analysis is pass, or select the manual save option if you only want to save specific analyses.

Note: *The automated save option is only available if you have purchased the analysis option. If you only have the inspection option, the save option is automatically set to manual.*



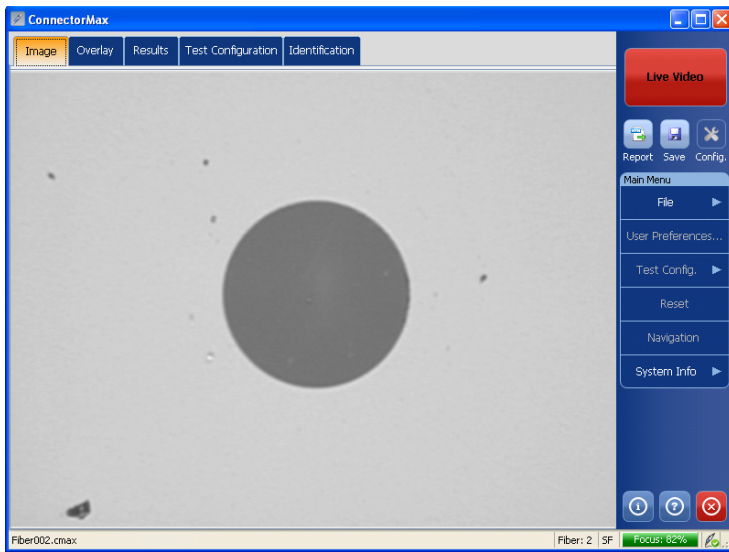
4. Click **Apply** to confirm your choice and continue working in the window, or **OK** to confirm your choice and close the window.

Inspecting Fiber Ends

Analyzing Captures (Optional, Single-Fiber Connector Mode Only)

Once the analysis option is activated, you will notice that when you capture a fiber image, all of the tabs in the viewing area will be available with information about the results. This information is read-only, except for the **Information** tab, and shows you the details you would see in the corresponding report, if you choose to make one.

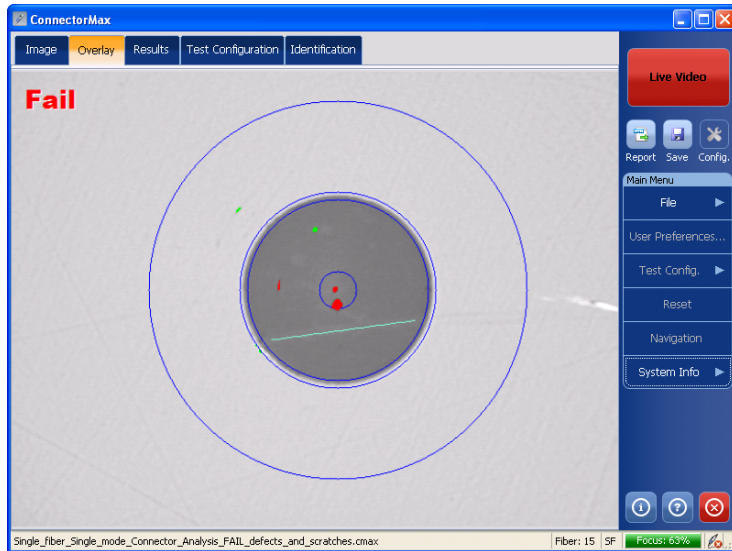
- The **Image** tab shows the snapshot of the fiber when you captured it. You can see some anomalies right away, but no analysis is performed.



Inspecting Fiber Ends

Analyzing Captures (Optional, Single-Fiber Connector Mode Only)

- The **Overlay** tab shows the status of the analysis, the analysis zones, and any anomalies (defects, scratches) found on the fiber endface.



Inspecting Fiber Ends

Analyzing Captures (Optional, Single-Fiber Connector Mode Only)

- The **Results** tab shows detailed information for scratches and defects detected in each test zone and the corresponding test status.

Zone	Scratches		Defects		Status
	Criteria	Counts	Criteria	Counts	
A: Core 0-25µm	0µm ≤ size < ∞	0	0µm ≤ size < ∞	0	Pass
B: Cladding 25-120µm	0µm ≤ size < 3µm	0	0µm ≤ size < 2µm	0	Pass
	3µm ≤ size < ∞	0	2µm ≤ size < 5µm 5µm ≤ size < ∞	0	
C: Adhesive 120-130µm	-	-	-	-	-
D: Contact 130-250µm	0µm ≤ size < ∞	0	0µm ≤ size < 10µm	0	Pass
			10µm ≤ size < ∞	0	

Fiber: Pass

ConnectorMax | Fiber: 2 SF | Focus: 82%

- The **Test Configuration** tab shows the detail of the test configuration you had selected to perform this analysis.



Creating Reports

You can create a report based on the current inspection and analysis results (single fiber mode only). This report is saved as an html, or mhtml file, depending on the format you select.

- The html report separates the text from the graphical elements and puts them in the folder separately.
- The mhtml report gathers all of the graphical elements and report text into one file.

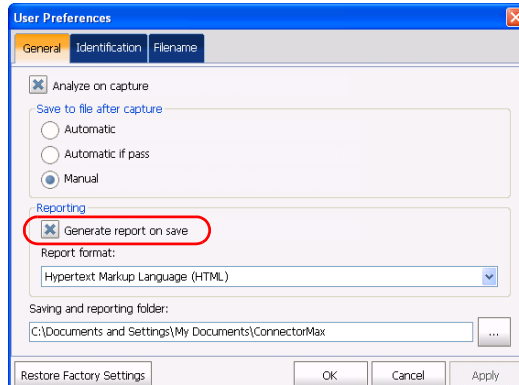
Note: *The mhtml format is automatically supported in Microsoft Internet Explorer version 6 and later. You could need to install a plugin to view this format in other types of browsers.*


Note: *The report creation is available only in Capture mode.*

If you have selected the **Generate report on save** option, a report is automatically created when you save your capture.

To activate automated report creation:

1. From the main window, select **User Preferences**.
2. Under the **General** tab, select **Generate report on save**.




3. Select the type of report you want.
4. If you want to change the default location where the reports will be saved, you can do so by using the  button.
5. Click **Apply** to confirm your choice and continue working in the window, or **OK** to confirm your choice and close the window.

Inspecting Fiber Ends

Creating Reports

To create a report manually:

1. From the main window, click  .

OR

Select the **File** menu, then **Report**.



2. Select the type of report you want to create, and the location for the report.
3. Click **Save** to close the window.

You can now open the report in any Internet browser from the location where the file was saved.

5 **Maintenance**

General Maintenance

To help ensure long, trouble-free operation:

- 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 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.

Maintenance

Charging the Battery in The FIP Viewer

Charging the Battery in The FIP Viewer

The new battery in the FIP Viewer must be fully charged before first use.

To charge the battery:

Connect the AC charger/adaptor to the FIP Viewer.

Normal charging time is about 4 hours.

Note: *The FIP Viewer may be used on AC charger/adaptor while the batteries are charging.*

Replacing Batteries

Your unit uses batteries with built-in protection that have been especially designed for EXFO. For this reason, you can only replace the main battery with a battery designed for your FIP-400.

You can purchase new batteries and empty battery compartments (also known as “battery covers”) from EXFO.



WARNING

There is a risk of explosion if you do not use the appropriate battery.



CAUTION

Use Li-Ion batteries of the same type and model only. Use of other batteries may damage the unit and compromise your safety.

To replace the battery:

- 1.** Acquire a new battery from EXFO.
- 2.** Turn off the unit (if the AC adapter is plugged in, you may replace the battery while unit is on).
- 3.** Open the battery compartment door located at the back of the unit.
- 4.** Replace the battery, respecting the polarity.
- 5.** Close the battery compartment door.



WARNING

Do not throw batteries into fire or water and do not short-circuit the batteries' electrical contacts. Do not disassemble.

Recycling and Disposal (Applies to European Union Only)

For complete recycling/disposal information as per European Directive WEEE 2012/19/UE, visit the EXFO Web site at www.exfo.com/recycle.

6 Troubleshooting

Solving Common Problems

The table below presents common problems and their solutions.

Problem	Solution
I cannot analyze an image	<ul style="list-style-type: none">➤ The image is not focused properly; use the focus knob on the probe until the focus indicator displays the best value available. Yellow indicates an acceptable range, and green shows the preferred range.
The analysis was interrupted before it was complete	<ul style="list-style-type: none">➤ Ensure that the probe is connected properly.➤ Ensure that the connector is aligned properly.➤ Ensure that the focus value is sufficient to perform the analysis.➤ Ensure that the contrast and brightness values are appropriate in the capture.➤ Ensure that you are using a high magnitude level.
I cannot see the fiber on-screen	<ul style="list-style-type: none">➤ Turn the probe on➤ Verify the probe connection status to see if ConnectorMax is detecting the probe properly. If the probe is connected properly, close ConnectorMax and open it again.➤ If you are using a USB adapter and the probe status is green, ensure that the probe is connected properly to the adapter. ConnectorMax will only function with the USB 2.0 dongle.

Troubleshooting

Contacting the Technical Support Group

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).

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

For detailed information about technical support, and for a list of other worldwide locations, visit the EXFO Web site at www.exfo.com.


If you have comments or suggestions about this user documentation, you can send them to customer.feedback.manual@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.

Viewing Information about ConnectorMax

You can view information about ConnectorMax such as the version number and contact information for technical support in the **About** window.


To view ConnectorMax information:

- On a computer, an FTB-500 or an FTB-1, from the main window, click .
- On an FTB-200 v2 Compact Modular Platform, select the **System Info**, then **About**.

Viewing Online Help

You can view the online help for ConnectorMax at any time.

To view the online help:

From the main window, click .

OR

From the main window, select **System Info**, then **Help**.

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.

7 **Warranty**

General Information

EXFO Inc. (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, 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.



IMPORTANT

The warranty can become null and void if:

- **unit has been tampered with, repaired, or worked upon by unauthorized individuals or non-EXFO personnel.**
- **warranty sticker has been removed.**
- **case screws, other than those specified in this guide, have been removed.**
- **case has been opened, other than as explained in this guide.**
- **unit serial number has been altered, erased, or removed.**
- **unit 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.

Warranty

Liability

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.



IMPORTANT

In the case of products equipped with optical connectors, EXFO will charge a fee for replacing connectors that were damaged due to misuse or bad cleaning.

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 62). 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 62).

Warranty

EXFO Service Centers Worldwide

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

Winchester House, School Lane
Chandlers Ford, Hampshire S053 4DG
ENGLAND

Tel.: +44 2380 246800
Fax: +44 2380 246801
support.europe@exfo.com

EXFO Telecom Equipment (Shenzhen) Ltd.

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.

Software

Platform Compatibility

FTB-1, FTB-200*, FTB-500

PC Compatibility and System Requirements

To be able to install and run ConnectorMax on your computer, you must meet the minimum requirements below:

SYSTEM ELEMENT	MINIMUM REQUIREMENTS (WINDOWS XP)	MINIMUM REQUIREMENTS (WINDOWS VISTA 32 AND 64 BITS)	MINIMUM REQUIREMENTS (WINDOWS 7 (32 AND 64 BITS))
Processor	Pentium (800 MHz or higher recommended)	Pentium (1.6 GHz or higher recommended)	Pentium (1.6 GHz or higher recommended)
RAM	256 MB (512 MB recommended)	256 MB (1 GB recommended)	512 MB (2 GB recommended)
Disk space	400 MB	400 MB	400 MB
Monitor	EXFO recommends a minimum screen resolution of 800 X 600 and a color quality value of at least 16 bits.		
Other requirements	.NET Framework 2.0 SP1 DirectX 9.0 (Windows XP, Vista and Windows 7) USB 2.0 (with Windows XP, Vista and Windows 7)		

SOFTWARE FEATURES

Fiber inspection	Single fiber Multiple fiber (software option)
Analysis	Single fiber (software option)
Reporting format	HTML MHTML

Technical Specifications

Video Inspection Probe

Video Inspection Probe

FIP-400 FIBER INSPECTION PROBE	
Size (H x W x D)	without tip cap 98 mm x 92 mm x 170 mm (1 1/2 in x 1 1/4 in x 6 11/16 in) with tip cap 98 mm x 92 mm x 200 mm (1 1/2 in x 1 1/4 in x 7 9/16 in)
Weight	0.2 kg (0.44 lb)
Resolution	<2 µm, 0.7 µm (typical)
Field of view	625 µm x 464 µm (low magnification) ^a 412 µm x 306 µm (high magnification)
Light source	Blue LED
Lighting technique	Coaxial
Capture button	Present on all models
Connector	EXFO probe port type (8 pin mini-DIN)
Focus control	Adjustable on the probe
Optical magnification	Adjustable, low and high (dual model only)
Temperature	operating -10 °C to 50 °C storage -40 °C to 70 °C
Relative humidity	0 % to 95 % non-condensing

Notes
^a. Dual model only.

Fiber Probe Viewer

FIBER PROBE VIEWER	
Size (H x W x D)	50 mm x 99 mm x 190 mm (1 15/16 in x 3 7/8 in x 7 1/2 in)
Weight ^b	0.3 kg (0.66 lb)
LCD screen	3.5 in TFT active matrix (320 x 240 pixels)
Power	Rechargeable Li-ion battery or AC adapter/charger
Battery life	3 hours (continuous use)
Charging time	4 hours
Connector	EXFO probe port type (8 pin mini-DIN)

Notes
^b. Without battery.

USB Converter

USB CONVERTER	USB 1.1 MODEL	USB 2.0 MODEL
Size (H x W x D)	20 mm x 36 mm x 90 mm (3/4 in x 1 7/16 in x 3 9/16 in)	19 mm x 36 mm x 95 mm (3/4 in x 1 7/16 in x 3 9/16 in)
Connectors	EXFO probe port type (8 pin mini-DIN)/USB	EXFO probe port type (8 pin mini-DIN)/USB
Capture button	No	Yes
ConnectorMax compatibility	No	Yes

B *Fiber Inspection Probe Tip Compatibility Chart*

The table below establishes the Fiber Inspection Probe tip compatibility with the different fiber inspection and the analysis (option) modules provided with the ConnectorMax application:

Tip Description	Tip Code	Inspection	Analysis
Uni.1.25 mm tip for PC connector	FIPT-400-U12M	X	X
LC tip for PC bulkhead adapter	FIPT-400-LC	X	X
FC and SC APC tip for bulkhead adapter	FIPT-400-FC-SC-APC	X	X
Uni.2.5 mm tip for APC connector	FIPT-400-U25MA	X	X
Uni.1.25 mm tip for APC connector	FIPT-400-U12MA	X	X
ST tip for UPC bulkhead adapter	FIPT-400-ST	X	X
FC and SC tip for bulkhead adapter	FIPT-400-FC-SC	X	X
Uni.2.5 mm tip for PC connector	FIPT-400-U25M	X	X
Extended SC tip for PC bulkhead adapter	FIPT-400-SC-L	X	X
MU tip for UPC bulkhead adapter	FIPT-400-MU	X	X
E-2000 tip for PC bulkhead	FIPT-400-E2000	X	X
MU-L tip for UPC bulkhead adapter	FIPT-400-MU-L	X	X
Tip for D4 bulkhead adapter	FIPT-400-D4	X	X
U20M2 tip for male ferule connector	FIPT-400-U20M2	X	X
LEMO tip for bulkhead adapter	FIPT-400-LEMO	X	X
E-2000 tip for APC bulkhead adapter	FIPT-400-E2000-APC	X	
OPTITAP tip for APC bulkhead adapter	FIPT-400-OTAP-APC	X	
OPTITIP MT tip kit for APC bulkhead adapter	FIPT-400-OTIP-MT-APC	X	

Fiber Inspection Probe Tip Compatibility Chart

Tip Description	Tip Code	Inspection	Analysis
OPTITIP MT tip for APC bulkhead adapter - male end	FIPT-400-OTIP-MT-APC/M	X	
LC tip for APC bulkhead adapter	TIP LC for APC bulkhead	X	
LC tip for bulkhead adapter 60 Degree Angled	FIPT-400-LC-A6	X	
LX5 tip for UPC bulkhead adapter	FIPT-400-LX5	X	
LX5 tip for APC bulkhead adapter	FIPT-400-LX5-APC	X	
MTP/APC tip for bulkhead adapter - Extended & Improved	FIPT-400-MTPA2	X	
MTP2 tip for bulkhead adapter	FIPT-400-MTP2	X	
MTP2 component used with FIPT-400-MTP2 tip	FIPT-400-MTP2-TIP	X	
MTPA component used with MTP2 tip	FIPT-400-MTPA-TIP	X	
Bulkhead adapter	FIPT-400-ADAPTER	X	
Tip for SMA bulkhead adapter	FIPT-400-SMA	X	
Tip for SMA male connector	FIPT-400-SMAM	X	
Tip for MTRJ bulkhead adapter	FIPT-400-MTRJ	X	

Contact your vendor for additional information regarding the most recent Fiber Inspection Probe tips that are not listed above.

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NOTICE

通告

CHINESE REGULATION ON RESTRICTION OF HAZARDOUS SUBSTANCES

中国关于有害物质限制的规定

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 镉 (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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