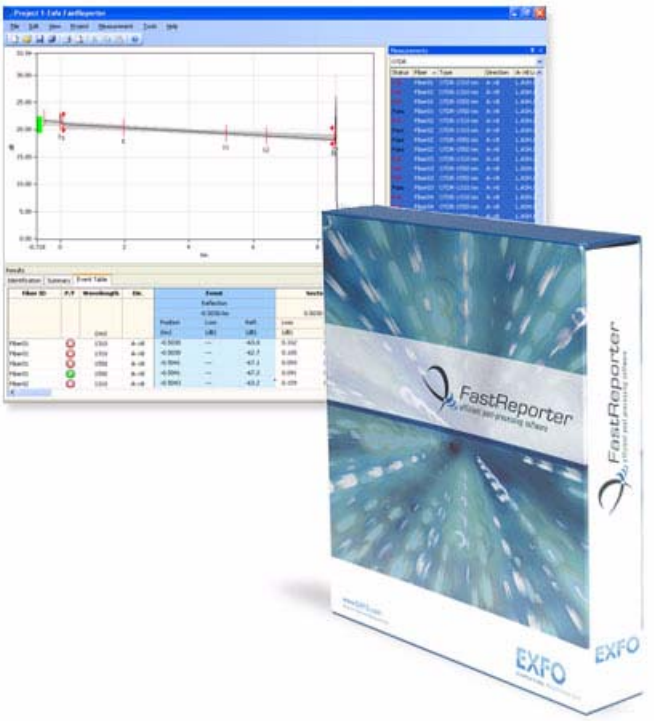
User Guide

FastReporter

Data Post-Processing Software



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Units of Measurement

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

Version number: 9.0.0

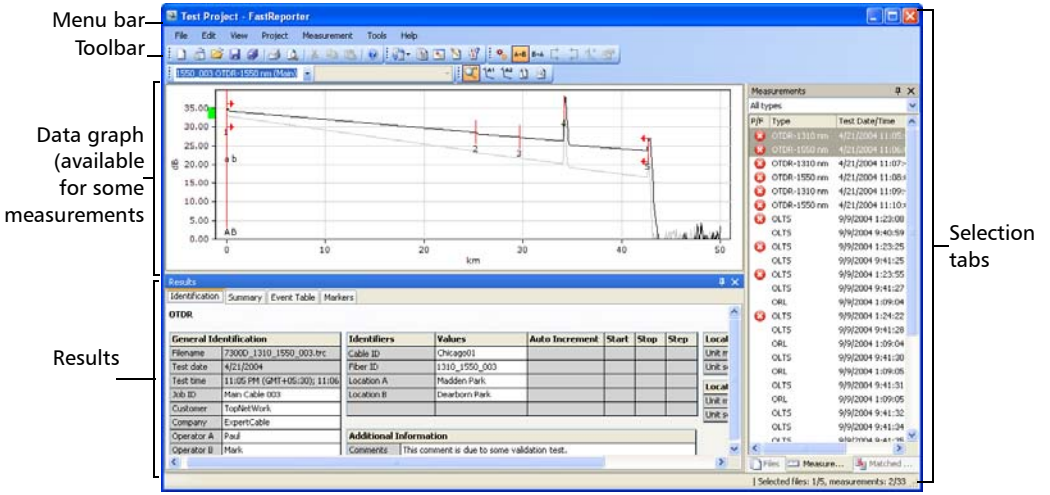
Contents

1 Introducing FastReporter

FastReporter is an advanced management, analysis and reporting tool for many types of optical tests, including the following:

- optical loss
- optical return loss (ORL)
- optical time-domain reflectometry (OTDR)
- polarization mode dispersion (PMD)
- chromatic dispersion (CD)
- PON power meter (PPM)
- fiber inspection probe (FIP)

The main window allows you to see at a glance the selected files, any related graph if available and the result data.



2 Getting Started with FastReporter

The computer onto which you want to install FastReporter needs to meet minimum requirements.

System Element	Minimum Requirement (Windows XP)	Minimum Requirement (Windows Vista - 32 and 64 bit)	Minimum Requirement (Windows 7 - 32 bit)	Minimum Requirement (Windows 7 - 64 bit)
Processor	Pentium (1.6 GHz or higher recommended)	Pentium (1.6 GHz or higher recommended)	Pentium (1.6 GHz or higher recommended)	Pentium (1.6 GHz or higher recommended)
RAM	256 MB (1 GB recommended)	512 MB (2 GB recommended)	1 GB (4 GB recommended)	2 GB (4 GB recommended)
Disk Space	400 MB			
Monitor	One super VGA (800 X 600) monitor (two 1024 X 768 monitors recommended)			
Other requirements	➤ Network adapter ➤ Microsoft Internet Explorer version 6.0 or later ➤ Microsoft Office 2000 or later to open .xls files			

Installing and Uninstalling FastReporter

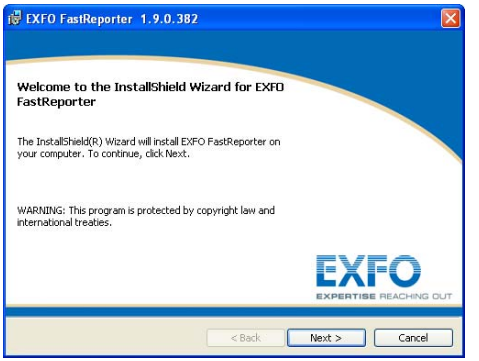
The installation wizard will guide you through the installation step by step.

To install FastReporter:

Insert the installation CD in the CD-ROM drive and follow the on-screen instructions.

If the installation wizard does not start automatically after inserting the CD, you will need to start the installation process as follows:

1. On the Windows taskbar, click the **start** button, then select **Run**.
2. Click the **Browse** button. On the CD, find *setup.exe* and double-click it.



3. Click **Next** to start the installation and follow the on-screen instructions. You can also refer to the release notes that came with your product.

Note: *FastReporter cannot be installed on the FTB-400 and FTB-500 platforms.*

To uninstall FastReporter:

Use the **Add/Remove Programs** utility in Windows' Control Panel as you would for any other application.

Starting FastReporter

Once installed, all you need to do is double-click the FastReporter shortcut on your computer desktop.

You can also access FastReporter from the start menu, through **start** > **Programs** > **EXFO**.

Registering FastReporter

When you purchase the software, you are attributed a purchase order (PO) number, which will help you retrieve the corresponding license.

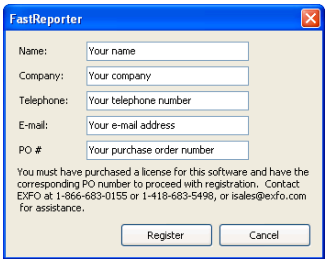
When you first start FastReporter, the following dialog box appears:

Three options are available:

- Register FastReporter: you can do this manually or directly by e-mail. See the procedure below for details.
- Use the trial version: This fully-enabled version is good for 30 days. When the trial period is over, the **Trial** button is no longer available.
- Exit FastReporter.

To register FastReporter:

1. From the welcome window, click **Register**.
2. Enter the required information in the registration dialog box.



IMPORTANT

- **EXFO strongly recommends that you enter the PO number in the registration dialog box, as it is used to help match your request with your order. If you do not enter the PO number, the registration process will be delayed.**
- **You must include a valid e-mail address in your request. EXFO will send the license file to that address. Your e-mail address will only be used for registration purposes.**
- **If you change the name of your computer on your network, or if you change the network card on your computer, you must send a new request for registration. You will not be charged for an additional license.**

3. Click **Register**.

   ➤ If you have Internet access on the computer where FastReporter was installed, an e-mail message will appear with all the details for the request and the Registration.bin file as an attachment. Modify the message if needed, and send it.

Note: *Depending on your e-mail client, you may need to answer a few security-related questions.*

OR

➤ If an e-mail message does not appear automatically, or if you do not have Internet access on the computer where FastReporter was installed, you will need to create a message manually and attach the Registration.bin file to it.

The Registration.bin file can be found in:

C:\Documents and Settings\All Users\Application Data\EXFO\FastReporter2\Standard, if your computer is running on Windows XP.

OR

C:\ProgramData\EXFO\FastReporter2\Standard, if your computer is running on Windows Vista or Windows 7.

Write *FastReporter Registration* in the subject line and send the message to register.fastreporter@exfo.com.

4. After approval by customer service, you will receive a KeyCode.lic file by e-mail. Save this file in the following location:

   C:\Documents and Settings\All Users\Application Data\EXFO\FastReporter2\Standard, if your computer is running on Windows XP.

   OR

   C:\ProgramData\EXFO\FastReporter2\Standard, if your computer is running on Windows Vista or Windows 7.

Once you have completed the registration process, the dialog box will no longer appear and you have direct access to the FastReporter main window.

Software Customization Wizard

The Software Customization Wizard helps you to customize the application according to your needs. The settings that can be made using the customization wizard are:

- Language settings
- Field of application
- Supported measurement types
- Distance units

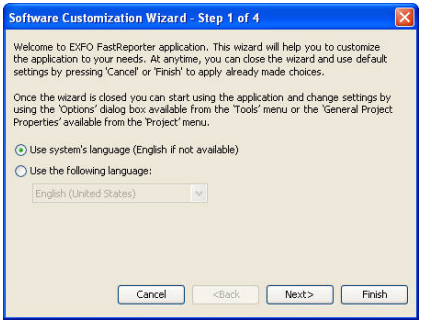
The software customization wizard window will appear after clicking the EXFO FastReporter icon, if FastReporter is already registered. If FastReporter is in trial period, the software customization wizard will appear just after the Trial window.

Note: *The software customization wizard will be displayed only once when the application is launched by the current Windows user for the first time.*

Note: *At any time while configuring the application using the software customization wizard, you can close the wizard and use default settings by clicking **Cancel** or by clicking **Finish** to apply the already made changes. Click **Back** to move to the previous page.*

To customize the FastReporter application:

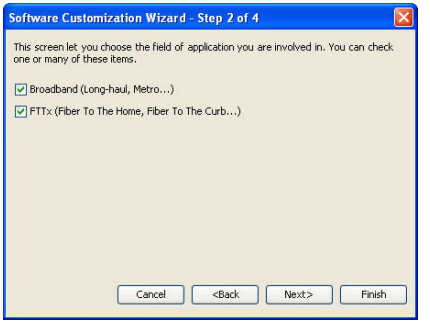
1. In the first step, select whether you want to use the default system language, or select the desired language from the list.



2. Click **Next**.

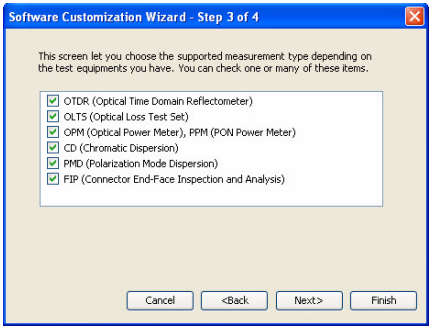
3. You can select one or both of the following options listed for field of application.

   - Broadband
   - FTTx



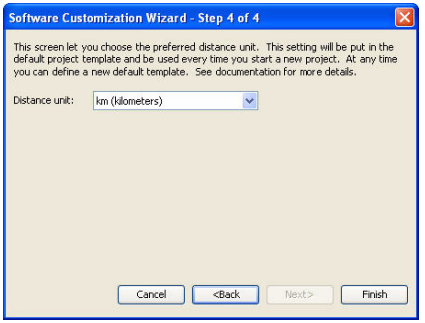
4. Click **Next**.

5. Select or clear the check box next to the measurement types that you want the application to support.



6. Click **Next**.

7. Select a unit for displaying distances from the **Distance units** list, if desired.

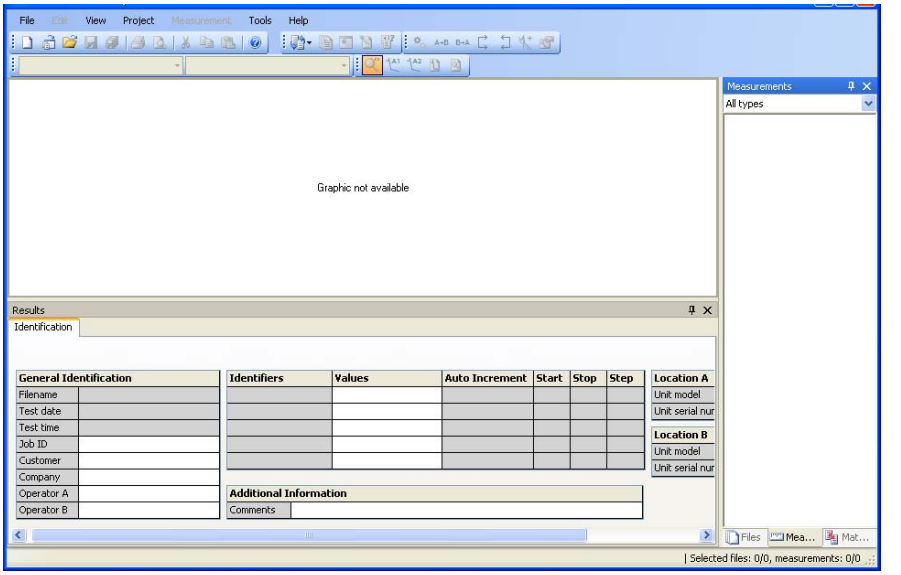


8. Click **Finish** to apply the changes and go to the main application window.

These settings can also be modified once the customization window is closed in the **Options** dialog box from the **Tools** menu or in the **General Project Properties** dialog box from the **Project** menu.

Customizing the Main Window

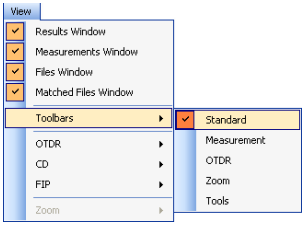
When you start FastReporter, the main window appears:



This window is fully customizable. You can add or remove toolbars, resize the panes as needed and move them around, or even auto-hide panes when they are not in use and reopen them later for punctual consultation.

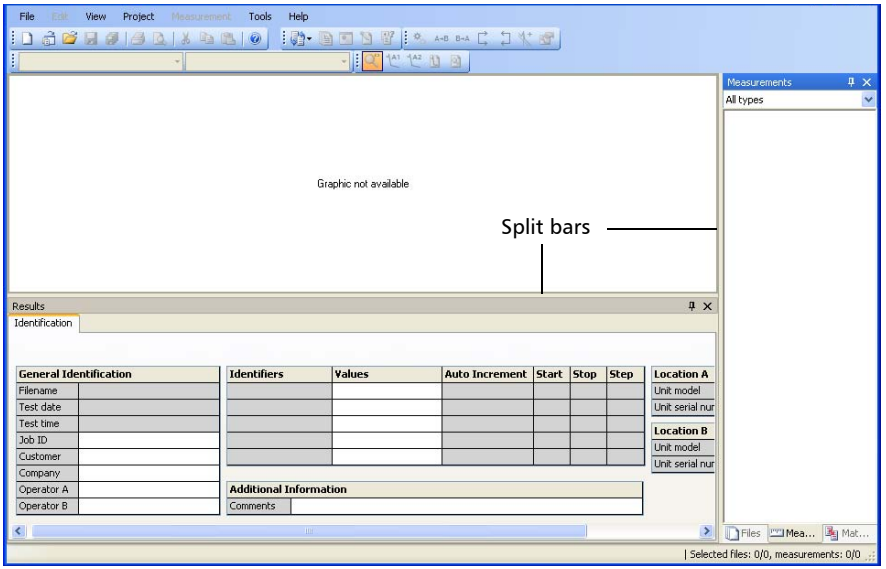
To display the various toolbars and panes:

1. In the main window, select the **View** menu.
2. Point to **Toolbars** and select or clear options according to what you want to display.



To resize a pane:

Use the split bars enclosing the pane you want to resize.



To close a pane:

Click the button in the upper right corner.

Note: *If you hide a toolbar, you can access the same commands on the menu bar.*

To move a toolbar:

1. Select the toolbar handle.
2. Click and drag the toolbar to the new location.

To auto-hide a pane or tab:

Click the vertical pushpin in the upper right corner of the pane.

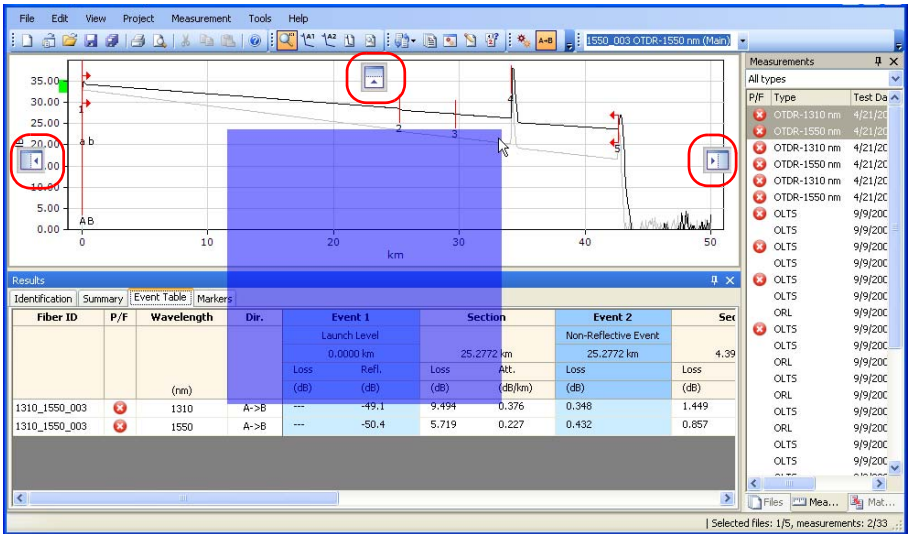
To show the pane again, move the mouse pointer over the desired hidden pane or tab.select the tab containing its name.

To turn off the auto-hide feature, click the horizontal pushpin.

To move a pane or tab:

1. Click and hold the selected pane title bar or tab to select it.

Anchor points indicate where the selected item can be moved. The purple area represents the item you are currently moving.



2. Drag the item from its current location to the desired anchor point, then release the mouse button.

Working with Two Monitors

If your computer is equipped with two monitors, you can use one of the monitors to view the trace files, and the other monitor to view the results or the tabs you work most with. For more information on setting two monitors on your computer, refer to the instructions provided with your monitors, computer and video card.

To move an item to the other monitor:

Drag the item release it when it appears on the desktop of the secondary monitor.

FastReporter will remember the size and position of the window the next time you start the application.

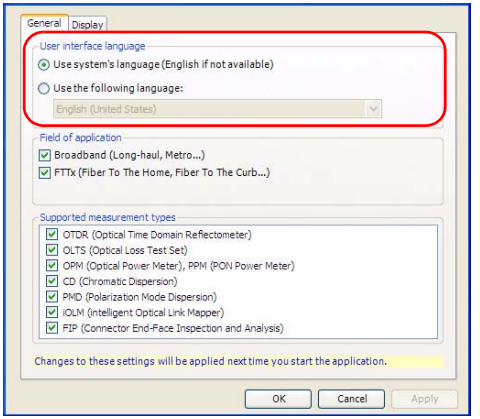
Another way of increasing workspace is to open Windows Explorer and drag it onto the desktop of the secondary monitor. You can then use the FastReporter drag-and-drop feature to add measurement files to your projects simply by dragging them onto the main FastReporter window and releasing the mouse button.

Changing FastReporter Options

You can change the general options including the user interface language, field of application, and supported measurement type or the display options including language, date, and time format. You can also clear the user interface by removing measurement types that you do not use.

To change the user interface language:

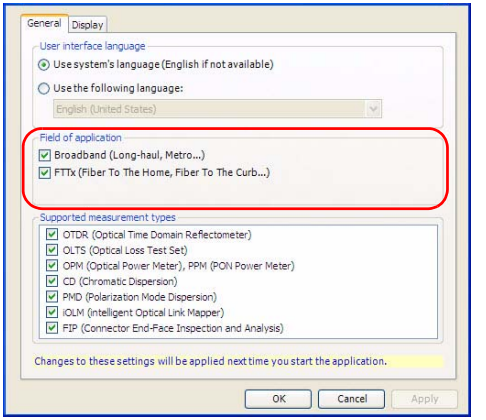
1. On the **Tools** menu, click **Options**.
2. Click the **General** tab.
3. Select whether you want to use the default system language, or specify the desired language in the list.



4. Click **Apply** to save your change and continue configuring FastReporter or **OK** to save your change and exit the window.

To select the Field of application:

1. On the **Tools** menu, click **Options**.
2. Click the **General** tab.
3. Select or clear the checkbox next to the fields of application that you want the application to support.

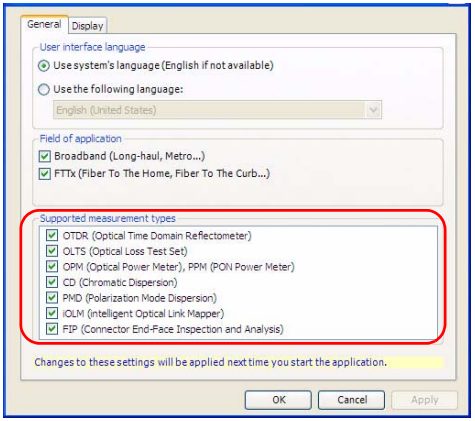


Note: *The Certification - field of application checkbox will be disabled, as it is currently not supported. It is mandatory to select at least one field of application.*

4. Click **Apply** to save your change and continue configuring FastReporter or **OK** to save your change and exit the window.

To change supported measurement types:

1. On the **Tools** menu, click **Options**.
2. Click the **General** tab.
3. Select or clear the check box next to the measurement types that you want the application to support.

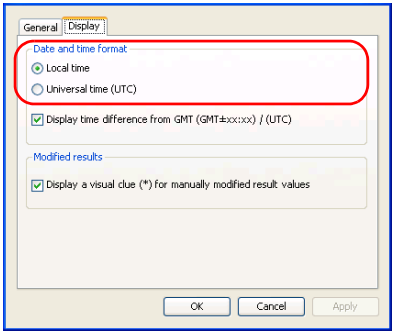


4. Click **Apply** to save your change and continue configuring FastReporter or **OK** to save your change and exit the window.

Note: *Any changes made to supported measurement types will only take effect after you exit and restart FastReporter.*

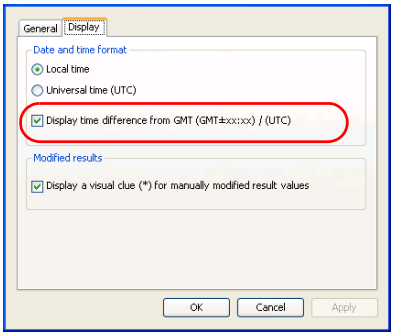
To change display options:

1. On the **Tools** menu, click **Options**.
2. Click the **Display** tab.
3. Click **Local time** to set time display to local time or **Universal time** to set time display to coordinated universal time (UTC).

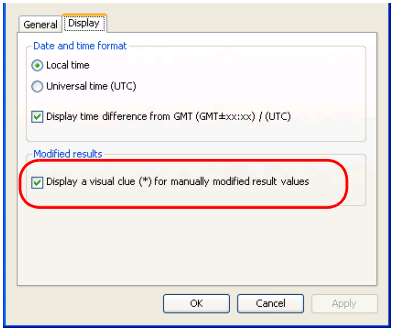


4. If needed, select **Display time difference from GMT / UTC** to display the difference between local time and GMT (Greenwich Mean Time), or UTC (depending on the option you selected in step 3).

Note: *Universal time and time difference from GMT / UTC options are only supported for OTDR and .cdpmd files.*



5. Under **Modified Results**, select **Display a visual clue (*) for manually modified result values** to display an asterisk (*) beside results that have been modified manually.



6. Click **Apply** to save your changes and continue configuring FastReporter or **OK** to save your changes and exit the window.

Exiting FastReporter

Note: *If there are unsaved changes to the project or project files, you will be prompted to save them when you exit the application.*

To exit FastReporter:

On the **File** menu, click **Exit**.

OR

Click the  in the top right corner of the main window.

3 Working with Projects

This section helps you use the features related to projects in FastReporter.

Creating a Project

Each time you start FastReporter, a project is created automatically using the default project template.

Adding and Removing Measurement Files

FastReporter lets you work with measurement files saved in different formats, but does not necessarily permit all operations on them. You can add the following measurement file formats to your FastReporter projects:

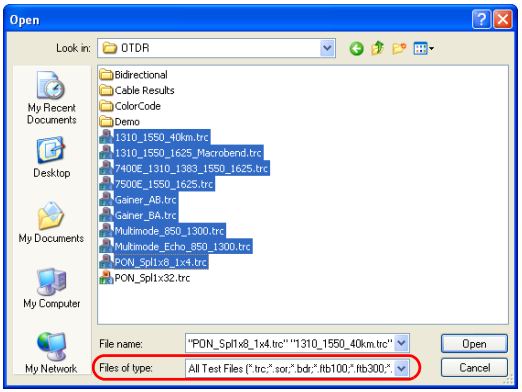
File format	File extension	Display	Modification	Reanalysis
Optical Time Domain Reflectometer (OTDR A->B, OTDR B->A)				
EXFO Native	.trc	✓	✓	✓
Telcordia (Bellcore) EXFO version 100	.sor	✓	✓	✓
Telcordia (Bellcore) EXFO version 200	.sor	✓	✓	✓
EXFO Bidirectional	.bdr	✓	✓	×
FTB-100 version 2.7	.ftb100	✓	✓	✓
FTB-300	.ftb300	✓	✓	✓
Telcordia (Bellcore) non-EXFO version 100	.sor	✓	×	×
Telcordia (Bellcore) non-EXFO version 200	.sor	✓	✓	×
Chromatic Dispersion				
EXFO CD	.exfocd	✓	✓	✓
CDPMD	.cdpmd	✓	✓	✓

File format	File extension	Display	Modification	Reanalysis
Polarization Mode Dispersion				
PMD	.pmd	✓	✓	✓
PMDB	.pmdb	✓	✓	✓
CDPMD	.cdpmd	✓	✓	✓
Optical Loss Test Set				
FOT-920, FOT-930	.olts	✓	✓	✓
	.olts2	✓	✓	✓
	.dat	✓	✓	✓
Pon Power Meter				
PPM-350C	.ppm	✓	✓	✓
iOLM	.iolm	✓	✓	✓
	.iolmcfg	✓	✓	✓
Fiber Inspection Probe				
FIP	.cmax	✓	✓	✗

To add measurement files to a project:

1. On the **File** menu, click **Open File**.
2. To display only files of a specified file type, select the file type in the **Files of type** list.

Note: *You can set the direction in OTDR files by selecting the direction when you add the files. For example, to set the direction of the selected OTDR files to A->B, select OTDR A->B in the* ***Files of type*** *list.*



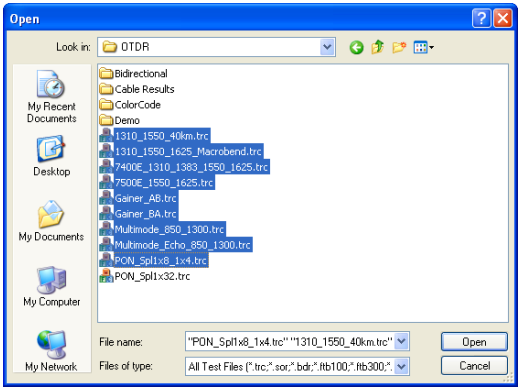
3. Select the measurement files to add. Multiple files can be added by one of the two ways:

   ➤ Click a file to select it, press the Shift key, and select another file.

   All files in the file list between the two files are highlighted.

   ➤ Click a file to select it, press the Ctrl key, and select another file (and another file if needed).

The selected files are highlighted.



4. Click **Open** to add the selected files to the project.

You can also use FastReporter drag-and-drop feature to add measurement files to your projects simply by dragging them from Windows Explorer onto the main FastReporter window and releasing. If you drag a folder containing measurement files, the latter will all be added to the project.

To remove measurement files from a project:

1. In the **Files** window, select the files you wish to remove.
2. On the **Edit** menu, click **Delete**.

   OR

   Click the right mouse button, and click **Remove** on the shortcut menu.
3. Confirm your choice by clicking on **OK**.

Opening a Project

FastReporter project files can contain one or more measurement files. The files included in a project can be from different sources (for example, OTDR and OLTS files).

There are four methods you can use to open a project in FastReporter.

To open a project:

1. On the **File** menu, click **Open Project**.
2. In the **Open** dialog box, select and open the folder containing the project you want to open.
3. Select the project file and click **Open**.

   OR

   Select a project file from the list of recent projects. The **Open Recent Project** option on the **File** menu lists up to four recently opened projects.

   OR

   Double-click a FastReporter project file in Windows Explorer.

   OR

   Drag a FastReporter project file from Windows Explorer onto the FastReporter main window.

Saving a Project

When you save a project in FastReporter, the project settings and *references* to the files you added to the project are saved. When you open the project file, the project settings you modified and the files you added will still be part of the project file, unless you moved or renamed any of the files. Any changes to the measurement files themselves, however, are not saved in the project file.

To save a project file:

On the **File** menu, click **Save Project**.

To save the project file and the measurement files in the project, click **Save All**.

To save a project file under a new file name:

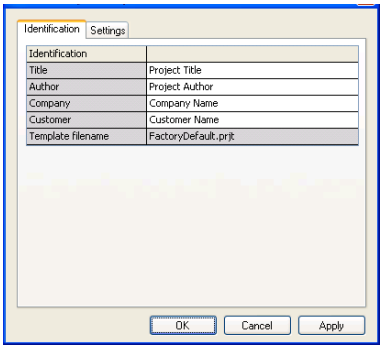
1. On the **File** menu, click **Save Project As**.
2. Type a new file name for the project.
3. Click **Save**.

Changing General Project Properties

You can provide a descriptive title for a project and identify the author, company, and customer.

To change General Project Properties:

1. On the **Project** menu, click **General Properties**.
2. Click the **Identification** tab.
3. Click in the column to the right of **Title** and type a title for the project.
4. Do the same for **Author**, **Company**, and **Customer**, typing the appropriate information in the column to the right of these labels.



The template file name for the project is displayed automatically according to the template you selected when you created the project.

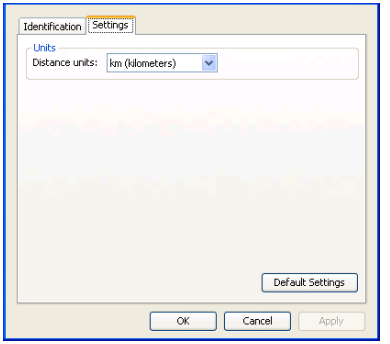
5. To apply the changes without closing the dialog box, click **Apply**.

Changing the Distance Units

By default, the unit of distance for projects is expressed in kilometers (km); however, this can be changed to miles (mi), kilofeet (kft), meters (m), or feet (ft).

To change the distance Units:

1. On the **Project** menu, click **General Properties**.
2. Click the **Settings** tab.
3. Select a unit for displaying distances from the **Distance units** list, if desired.



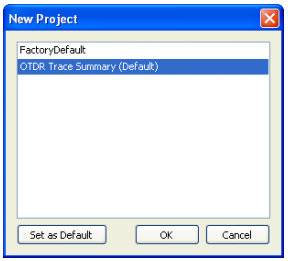
4. To apply the changes and close the dialog box, click **OK**. To set the distance units back to kilometers, click **Default Settings**.

Creating Project Templates

You can save the properties and settings you often use when creating projects in a project template.

To create a project template:

1. On the **File** menu, point to **New**, and click **Project**.
2. In the list, click a template. If there is an existing template that already has properties and settings that you want to use in the new template, you can use it as a starting point.



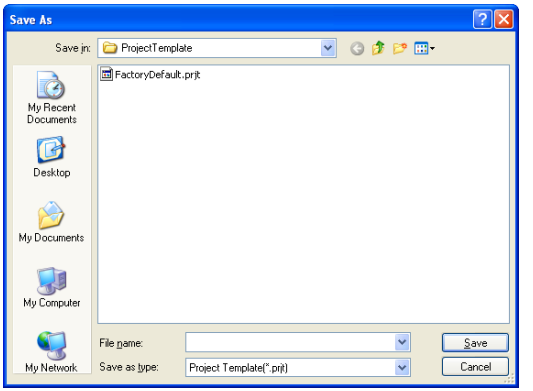
3. Click **OK**.
4. Change the properties and settings to suit the projects you want to create with the new template.

Note: *Changes made to the display (for example, showing/hiding windows and toolbars using the **View** menu) or to program options (**Options** on the **Tools** menu) are saved when you end your work session. They are not saved in project templates.*

5. On the **File** menu, click **Save Project As Template**.

6. In the **File name** box, type a name for the project template file.

   FastReporter automatically selects the folder where to save the project template.



7. Click **Save**.

Note: *FastReporter automatically saves project templates in the Project Template folder. If you change the location, the template will not be available for selection in the **New Project** dialog box when you start a new project.*

To change the default template file:

1. On the **File** menu, point to **New**, and click **Project**.
2. To set the new project template as the default template, click the file name, and click **Set as Default**.

3. Click **OK** to start a new project or **Cancel** if you do not wish to start a new project at this time.

Renaming Project Templates

To rename a project template, rename the project template file as you would any other file while leaving the .prjt file extension intact. The template will be listed on the **New Project** dialog box with the new name.

Removing Project Templates

To permanently remove a project template, simply delete the project template file in the Project Template folder. To remove a project template so that it is no longer listed on the **New Project** dialog box, move it from:

C:\Documents and Settings\All Users\Application Data\EXFO\FastReporter2\Standard\Project Template to another folder, if your computer is running on Windows XP.

OR

C:\ProgramData\EXFO\FastReporter2\Standard\Project Template to another folder, if your computer is running on Windows Vista or Windows 7.

If you later need to use the template, you can simply move it back to the Project Template folder.

4 Working with OTDR Files

Accepted File Formats

FastReporter lets you work with measurement files saved in different formats, but does not necessarily permit all operations on them.

File format	File extension	Display	Modification	Reanalysis
EXFO Native	.trc	✓	✓	✓
Telcordia (Bellcore) EXFO version 100	.sor	✓	✓	✓
Telcordia (Bellcore) EXFO version 200	.sor	✓	✓	✓
EXFO Bidirectional	.bdr	✓	✓	×
FTB-100 version 2.7	.ftb100	✓	✓	✓
FTB-300	.ftb300	✓	✓	✓
Telcordia (Bellcore) non-EXFO version 100	.sor	✓	×	×
Telcordia (Bellcore) non-EXFO version 200	.sor	✓	✓	×

Changing OTDR Settings

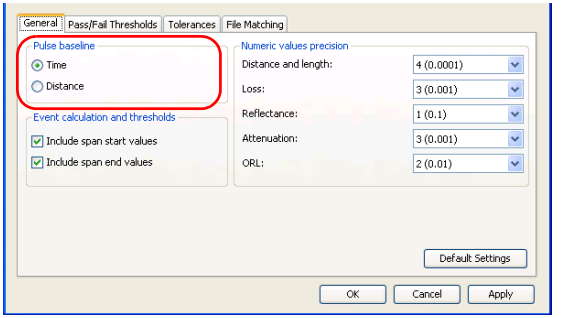
The **OTDR Properties** dialog box consists of four tabs where you can change general properties, pass/fail thresholds for selected wavelengths, event matching tolerances, and automatic file matching rules for OTDR projects.

Changing General Properties

To change OTDR General options:

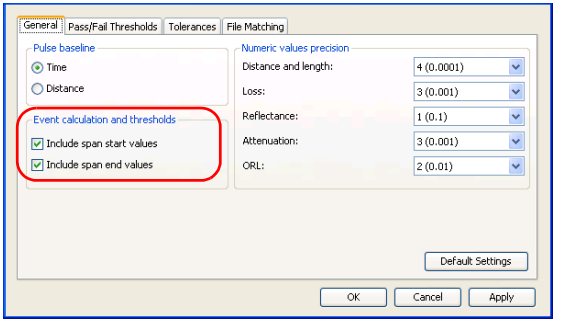
1. On the **Project** menu, select **OTDR Properties**.
2. Click the **General** tab.
3. Click **Distance** to change the pulse baseline from time to distance, if desired.

Note: *The pulse baseline distance is always given in meters.*



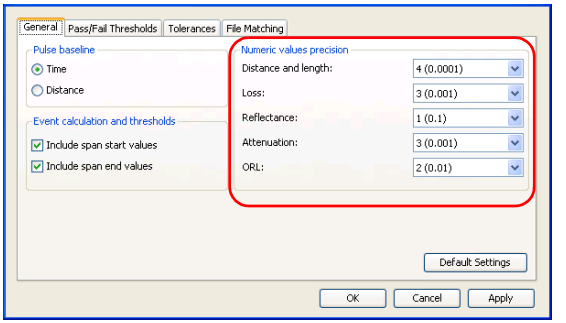
4. Select or clear the options for including or excluding span start or end values.

Note: *When span start and end values are excluded, thresholds are no longer applied to the span start and/or span end events.*



5. Use the lists to change the numeric values precision setting for distance and length, loss, reflectance, attenuation, or ORL, if desired.

These settings also affect span loss, average loss, average splice loss and maximum splice loss.



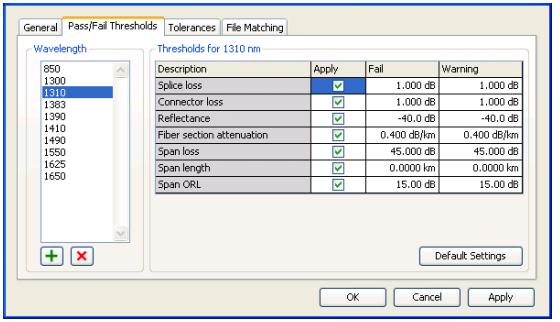
6. To apply the changes without closing the dialog box, click **Apply**.

To return the general settings back to their original values, click **Default Settings**.

Changing Pass/Fail Thresholds

To change OTDR Pass/Fail Thresholds:

1. On the **Project** menu, select **OTDR Properties**.
2. Click the **Pass/Fail Thresholds** tab.



3. Select a wavelength or wavelengths to modify using the Ctrl or Shift keys. If you do not see the wavelength you want to use, you can add it by clicking the ⊞ button, entering the wavelength value, and clicking **OK**.
4. Modify the thresholds associated with the wavelengths needed. by clicking in the desired threshold value and modifying it in the table. The **Apply** option must be enabled for the threshold to be active and modifiable. If you have selected more than one wavelengths, all of them will be modified at the same time.
5. To apply the changes without closing the dialog box, click **Apply**. To apply the changes and close the window, click **OK**.

Setting Macrobend Tolerances

FastReporter can locate macrobends by comparing the loss of events occurring at a certain wavelength (for example, 1310 nm) with the loss of the corresponding events at a greater wavelength (for example, 1550 nm).

FastReporter will identify a macrobend when comparing two events if:

- Of the two events, the greater loss occurred at the greater wavelength.

  AND

- The difference between the loss of two events exceed the defined delta loss value. The default delta loss value is 0.5 dB (which is suitable for most fibers), but you can modify it.

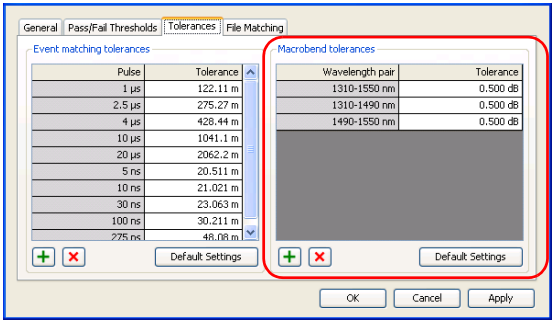
Changes made to event matching tolerances will affect macrobends.

To set macrobend tolerances:

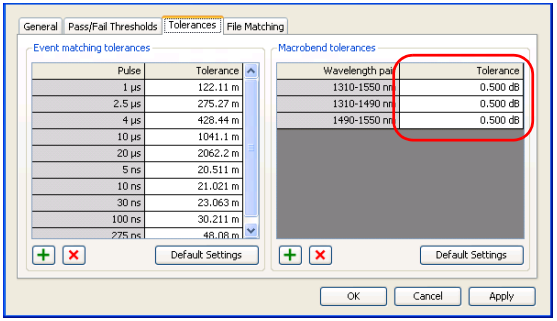
1. On the **Project** menu, select **OTDR Properties**.
2. Click the **Tolerances** tab.
3. If needed, add a wavelength pair by clicking the ⊞ button located at the bottom of the **Macrobend tolerances** section, entering the wavelength values, and clicking **OK**.

   To remove one or more wavelengths, select the values in the **Wavelength** list using the Ctrl or Shift keys as needed, and click the ⊠ button.

   If you select more than one wavelength in the list, any modification to the thresholds will apply to all of the selected wavelengths.



   If needed, change the tolerance for the wavelength pair, by clicking the corresponding tolerance value in the **Tolerance** column, and enter the new value.



4. To remove all added wavelength pairs and set all tolerance values back to their original settings, click **Default Settings**.

5. In the **OTDR Project Properties** dialog box, click **OK**.

To view macrobends:

From the main window make sure that the macrobends are displayed in the event table: on the **View** menu, select **OTDR**, select **Event Table**, and click **Macrobends**.

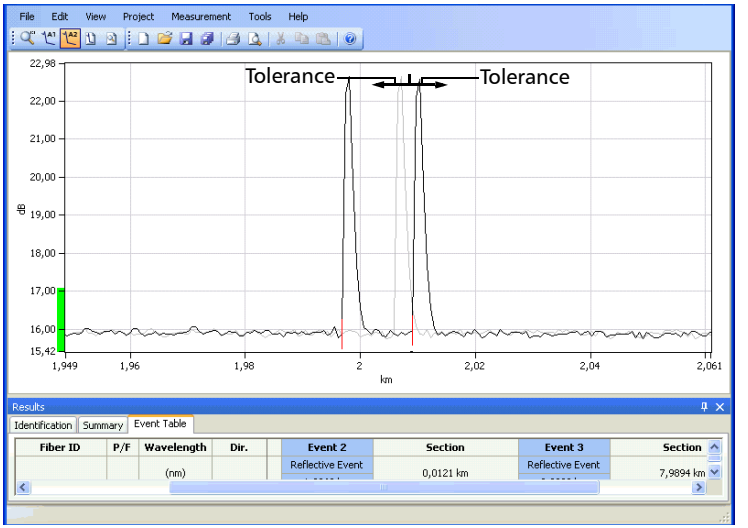
Macrobends are identified in the OTDR Event Table by the following symbol:  .

In the case where you have multiple files with a single wavelength (this often occurs for Bellcore type files), you must first match those files in order to see the possible macrobends in the **Matched Files** tab, then select these matched files to view the macrobends in the event table.

Setting Event Matching Tolerances

The OTDR Event Table is built by matching events from selected measurements according to the tolerance. To be matched, the distance between events from the different measurements must be within the tolerance.

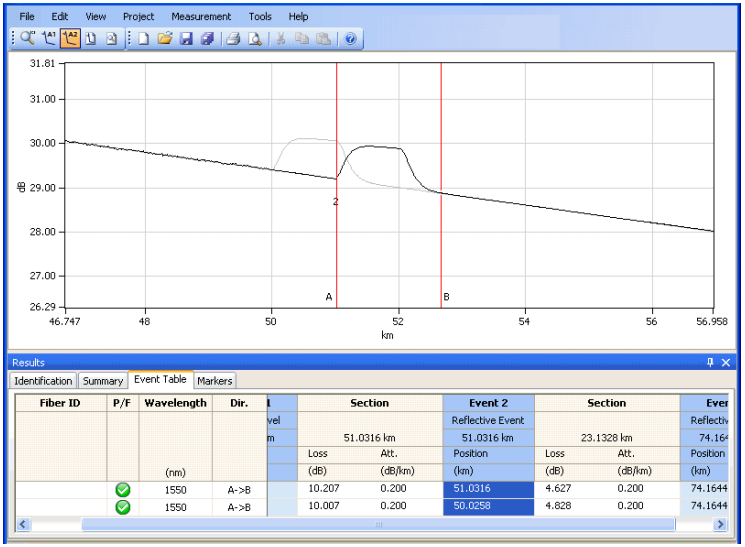
You can force the matching of two events or separate them by changing the event matching tolerance accordingly. The tolerance is applied to all operations related to the event table including apply reference as template, macrobends, and bidirectional tools.



Although you can set the event matching tolerance to as little as 20 meters for each pulse width, the results may differ due to *cursor aliasing*. Cursor aliasing checks if markers A and B for two events overlap. These markers are set during analysis. Marker A represents the beginning of a measured event while marker B represents its end.

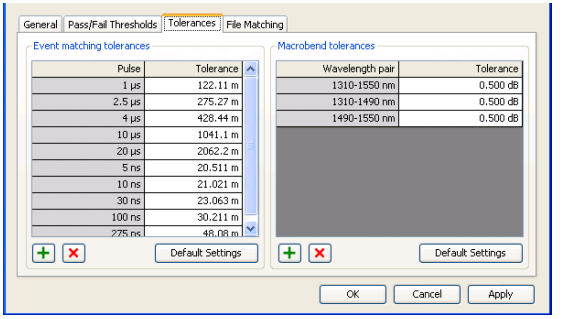
This means that two events could be matched in the event table even if their markers A are farther apart than the tolerance if there is an overlap between the spans created by their markers A and B. Cursor aliasing becomes more important with larger pulse widths since these traces have greater A-B spans.

The image below illustrates cursor aliasing on two reflective events.



To change OTDR event matching tolerances:

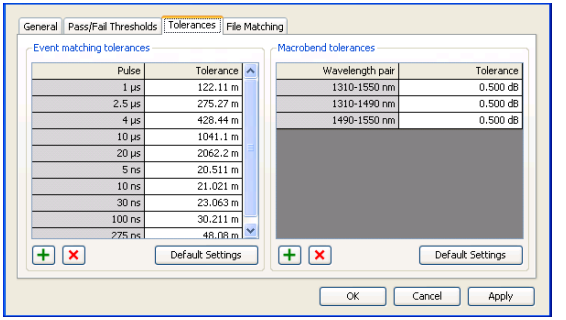
1. On the **Project** menu, select **OTDR Properties**.
2. Click the **Tolerances** tab.



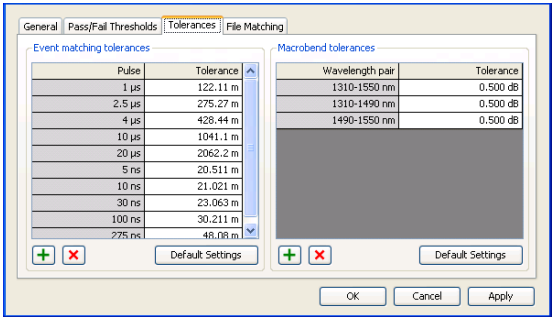
3. If needed, add a pulse by clicking the + button located at the bottom of the **Event matching tolerances** list, enter the pulse value, and click **OK**.

   To remove one or more pulses, click the values in the **Pulse** list, and click the × button located at the bottom of the **Event matching tolerances** list using the Ctrl or Shift keys as needed.

4. Change the tolerance for the pulse as needed, click the tolerance value in the **Tolerance** column to the right of the pulse, and enter the new value.



5. To remove all added pulses and set all tolerance values back to their original settings, click **Default Settings**.



6. To apply the changes without closing the dialog box, click **Apply**. To apply the changes and close the dialog box, click **OK**.

See *Setting Macrobend Tolerances* on page 40 for instructions on using the **Macrobend tolerances** section on the **Tolerances** tab.

See *Matching Files* on page 65 for instructions on using the **File Matching** tab options.

Setting OTDR Event Table Options

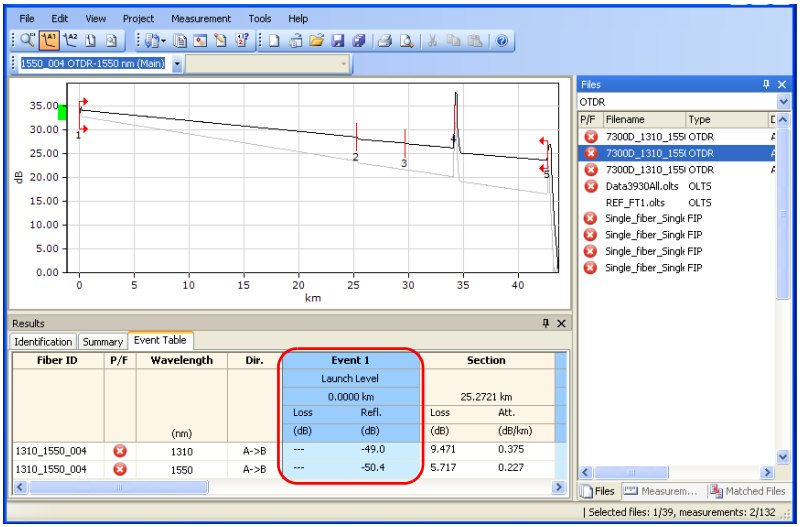
You can hide the information displayed in the OTDR event table. OTDR events can be edited if the file format supports modification.

To set event table view options for OTDR events:

1. On the **View** menu, select **OTDR**, then **Event Table**.

   OR

   On the main window, in any **Event** column of the **Results** window, click the right mouse button and select **View** on the shortcut menu.



2. Select or clear any of the following event view options:

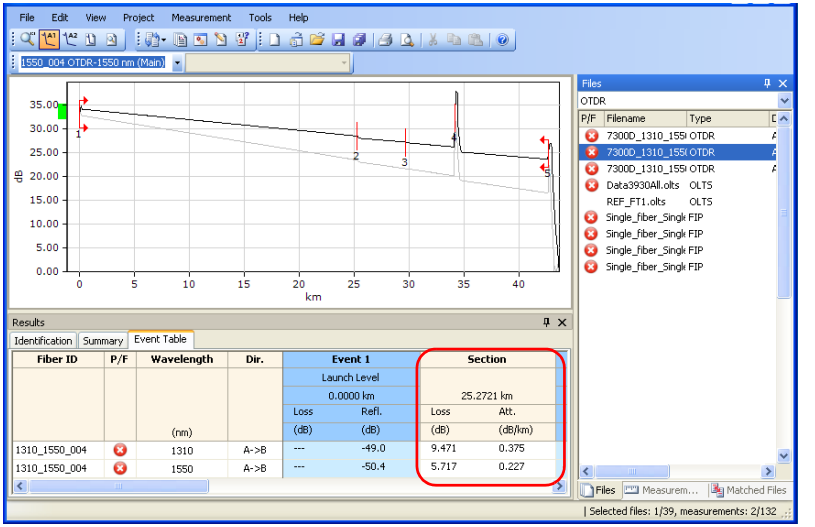
View Option	Description
Event	Displays or hides the event details.
Event Loss Column	Displays or hides the event **Loss** column.
Reflectance Column	Displays or hides the **Reflectance** column.
Merge Details	Displays or hides the merge details.
Macrobends	Displays or hides macrobends.
Event Position Column	Displays or hides the event **Position** column.
B->A Position from B	If the bidir. details and event position are displayed in the window, this will display the events positions according to B (for example, the last event will be identified as the first event.

To set event table view options for OTDR sections:

1. On the **View** menu, select **OTDR**, and select **Event Table**.

OR

On the main window, in the **Section** column of the **Results** window, click the right mouse button and select **View** on the shortcut menu.



2. Select or clear any of the following section view options:

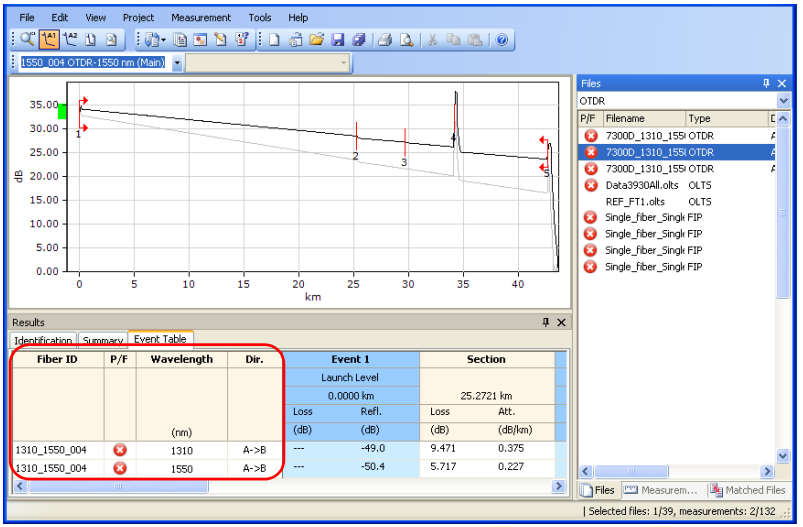
View Option	Description
Section	Displays or hides the section details.
Section Loss Column	Displays or hides the section **Loss** column.
Attenuation Column	Displays or hides the **Att.** (attenuation) column.
Section Length Column	Displays or hides the section **Length** column.

To set other event table view options:

1. On the **View** menu, select **OTDR**, and select **Event Table**.

OR

On the main window, in the **Fiber ID**, **P/F**, **Wavelength**, or **Dir.** columns of the **Results** window, click the right mouse button and select **View** on the shortcut menu.



2. Select or clear any of the following view options:

View Option	Description
Event	Displays or hides the event details.
Section	Displays or hides the section details.
Statistics	Displays statistics (minimum, maximum, and average) for each column.
Bidir. Details	Displays bidirectional details (A->B, B->A, average).

To edit OTDR events:

1. From the main window, select the **Event Table** tab in the **Results** window.
2. In the **Event** or **Section** column, click the right mouse button. You can select more than one item with the Ctrl or Shift keys for all edit options, except for adding to other measurements.
3. On the shortcut menu, click any of the following edit options:

Edit Option	Description
Delete	Displays a dialog box to confirm deletion of the selected event. Click **Yes** to delete or **No** to cancel. An event can be deleted only if the file format supports modification. Events set as Span Start or Span End cannot be deleted.
Set as Span Start	Sets the selected event as the span start.
Set as Span End	Sets the selected event as the span end.
Add to other measurements	Adds the selected event to other selected OTDR measurements. An event can be added to other measurements only if the file format supports modification.
Properties	Displays the **OTDR Event Properties** dialog box, where you can edit properties for the selected events or sections.

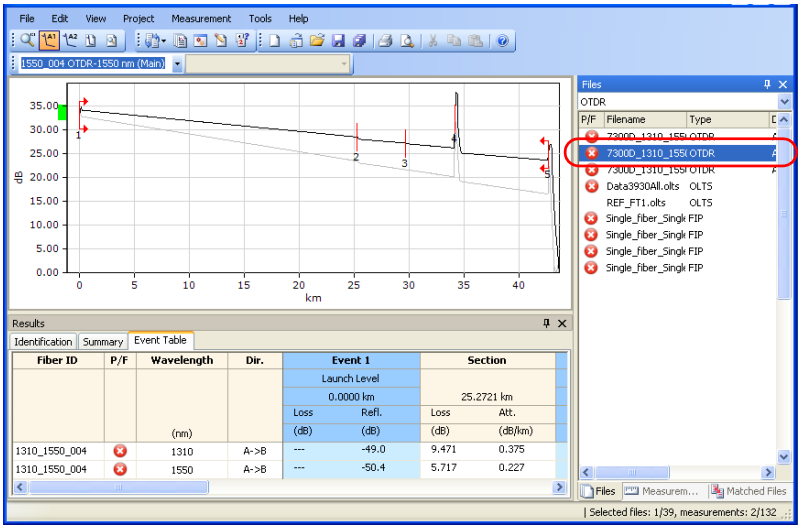
These edit options, with the exception of **Delete**, are also available on the **Measurement** menu (select **OTDR**, then **Event**). The **Delete** option is available on the **Edit** menu.

Editing OTDR Event Properties

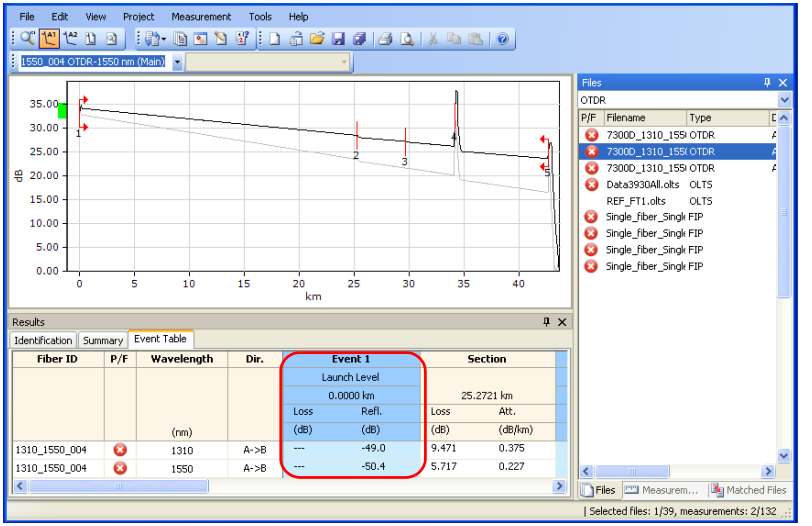
You can edit the properties for OTDR events and sections in the **OTDR Event Properties** dialog box. Event properties that cannot be edited are shaded.

To edit OTDR event properties:

1. In the **Measurements** window, select an OTDR measurement file.



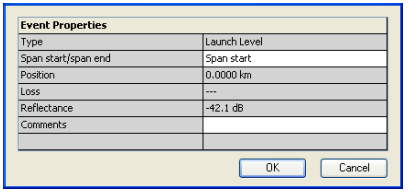
2. In the **Event** table, select the events or sections to modify.



3. On the **Measurement** menu, select **OTDR**, select **Event**, and click **Properties**.

OR

Click the right mouse button and click **Properties** on the shortcut menu.



4. Modify the properties as needed. The editable values are shown in a white background.

➤ You can change the event type from the list of available choices.

➤ To add information about the event, type in a comment in the corresponding location.

5. Click **OK** to confirm your changes.

OTDR Graphic Display Options

You can change the display of graphics for OTDR measurements.

To change OTDR graphic display options:

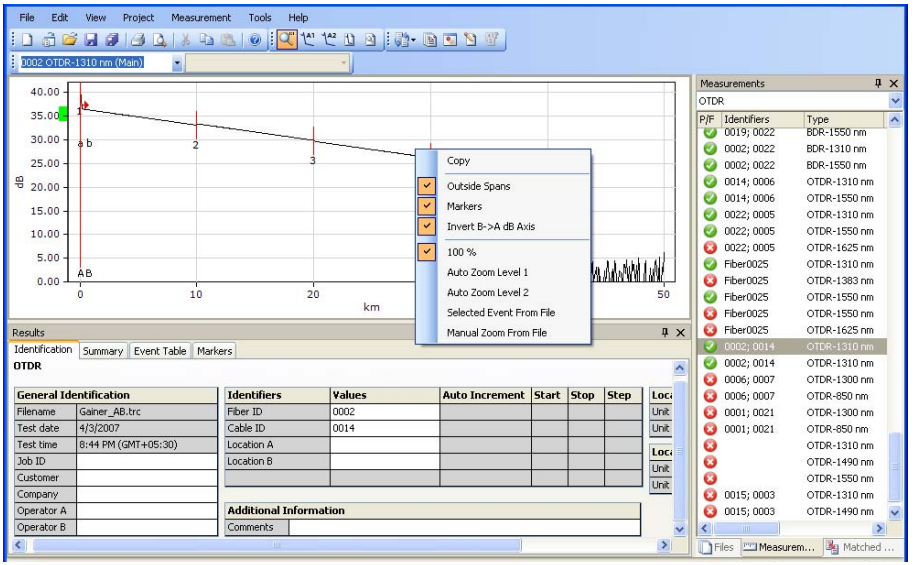
1. On the **View** menu, select **OTDR** to display the OTDR graphic display options.

   OR

   On the graphic itself, click the right mouse button to display the OTDR graphic display options on the shortcut menu.

2. Select or clear any of the following OTDR graphic display options:

- ➤ **Outside Spans** to display or hide information outside the measurement spans on the graphic.
- ➤ **Markers** to display or hide markers on the graphic.
- ➤ **Invert B->A dB Axis** to invert B to A along the dB axis on the graphic.



OTDR Zoom Options

You can select from different zoom options on graphics for OTDR measurement files.

To change OTDR zoom options:

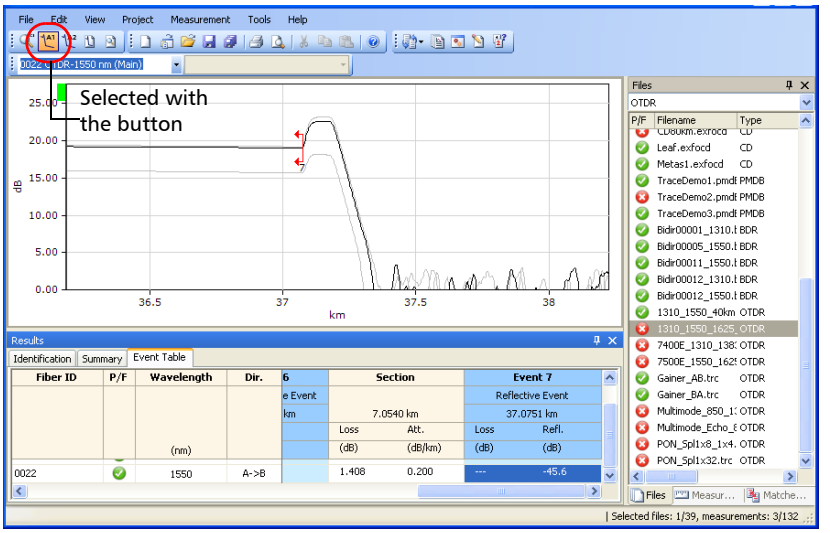
1. On the **View** menu, select **Zoom** to display the OTDR zoom options.

   OR

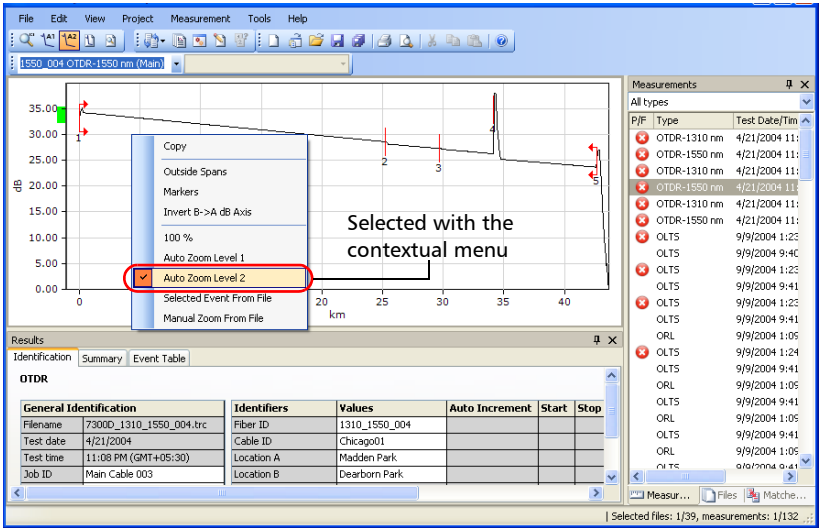
   On the graphic, click the right mouse button to display the OTDR zoom options on the shortcut menu.

2. Select one of the following OTDR zoom options:

   - **100 %** to display the full graphic for the measurement (default setting).
   - **Auto Zoom (level 1)** to put the emphasis on reflective events. Auto Zoom (level 1) is illustrated for one selected event in the image below.



➤ **Auto Zoom (level 2)** to put the emphasis on losses. Auto Zoom (level 2) is illustrated for two selected events in the image below.



➤ **Selected Event from File** to zoom to a selected event that was saved in the file, if present. Auto Zoom (level 1) will be applied.

➤ **Manual Zoom from File** to manually zoom using information saved in the file, if present.

Applying an OTDR Reference as a Template

The **Apply Reference as Template** tool allows you to analyze measurements and compare them to a reference file. The template concept is to set a reference file (template), add comments about the events, and compare each measurement to the reference file. FastReporter will mark and measure any missing event. Inserted events are indicated by an asterisk (*). Event matching tolerances will effect template results. Events not present in the reference appear as white columns. Comments for events in the reference file are automatically copied to the selected files.

The measurement file format must support this feature.

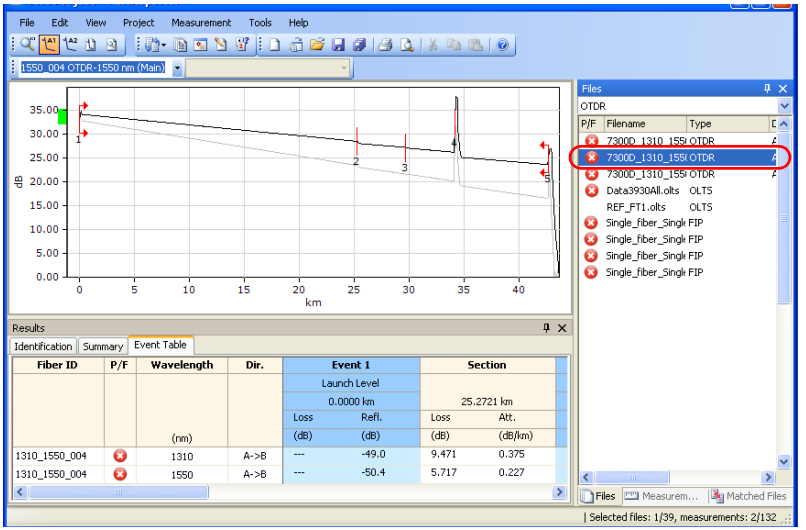
Singlemode measurements will be compared to *singlemode* measurements; *multimode* measurements will be compared to *multimode* measurements.

The measurement files must meet the following criteria:

Item	Description
Measurement file	Must have at least two events.
	Must have a span start and span end.
	Must have a fiber section.

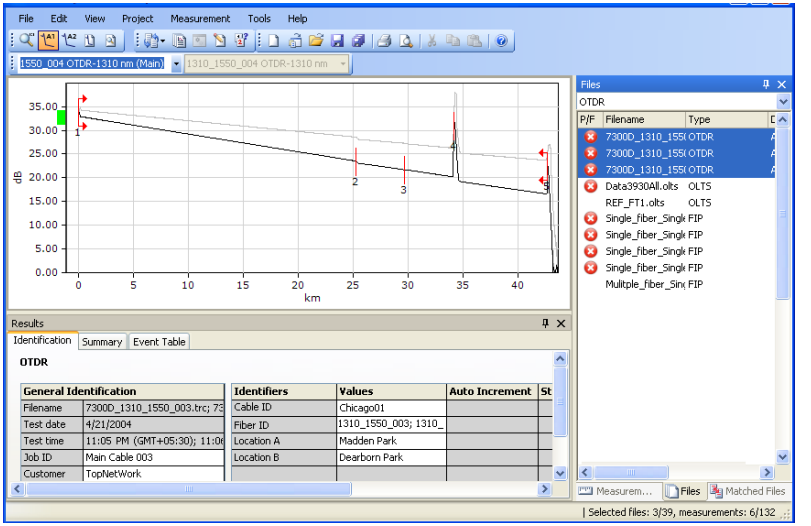
To apply an OTDR reference as a template:

1. In the **Files** window, select the OTDR file that will serve as the reference.



2. On the **File** menu, click **Set as Reference File**.

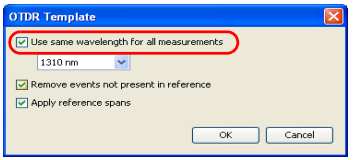
3. In the **Files** window, select the OTDR files to which to apply the reference file as a template.



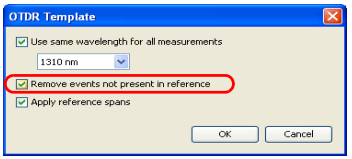
4. On the **Tools** menu, point to **OTDR**, and click **Apply Reference as Template**.

5. On the **OTDR Template** dialog box, select **Use same wavelength for all measurements** and select a wavelength from the list if you want FastReporter to apply the same wavelength to all measurements.

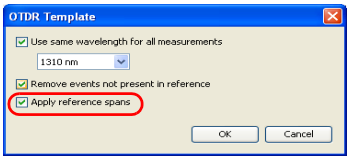
   For multiple wavelength files used as a reference, if **Use same wavelength for all measurements** is not selected, measurements will be compared to the same wavelength (for example, 1310 nm with 1310 nm, 1550 nm with 1550 nm). For example, a 1550 nm measurement that is part of a reference file will be used for comparison, although it may not be selected in the **Measurements** window.



6. Select **Remove events not present in reference** if you want the events not present in the reference file removed from the selected files.



7. Select **Apply reference's spans** if you want to apply the reference file's spans to the selected files.



8. Click **OK**.

Analyzing or Reanalyzing Measurements

FastReporter lets you analyze measurements at any time. Analyzing or reanalyzing measurements will:

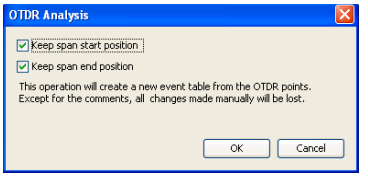
- reanalyze measurements acquired from different sources or with other products.
- recreate the original event table if it was modified.
- reset the span start to zero and the span end to end-of-fiber, if desired.

To reanalyze measurements:

1. In the **Measurements** window, select the measurements to reanalyze.
2. On the **Measurement** menu, select **OTDR**, and click **Analyze**.

   OR

   In the **Measurements** window, click the right mouse button and click **Analyze** on the shortcut menu.
3. In the **OTDR Analysis** dialog box, select or clear the following options:
   - **Keep span start position**: clear only if you want to reset the span start to zero.
   - **Keep span end position**: clear only if you want to reset the span end to end-of-fiber.



4. Click **OK**.

   Once the analysis is performed, the window is refreshed automatically.

Matching Files

FastReporter provides three options for matching OTDR files in projects. File matching in other types of projects is always based on information present in the file (for example, matching fiber IDs). This is the default setting for projects, however, you can also match files by file name and have FastReporter ignore expressions in the file names. The third option available for projects is manual file matching.

When matching is done by file name, FastReporter will ignore the selected expression in the file name. For example, if you select A_B as the expression to ignore, FastReporter will take a file named fiber1 A_B.trc and a file named fiber1.trc as matching.

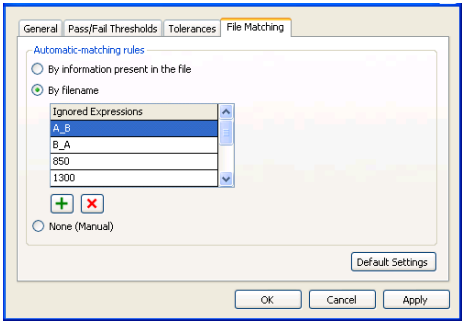
Note: *The matching function is not case sensitive and will match actual numbers (for example, 001 and 1 are both considered as the same number).*

Matching Files Automatically

The automatic file matching feature can be customized to make sure that only the files you are truly looking for are located using a list of expressions to ignore.

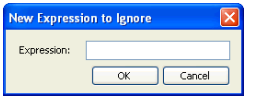
To automatically match OTDR files by file name:

1. On the **Project** menu, select **OTDR Properties**.
2. Click the **File Matching** tab.



3. Click **By filename**.
4. If needed, add or remove items.

   ➤ Click ⊞, then type the expression to add to the list and click **OK**.



   ➤ Select an expression from the **Ignored Expression** list, then click ⊠ to remove it.

5. Click **OK** to exit the window.

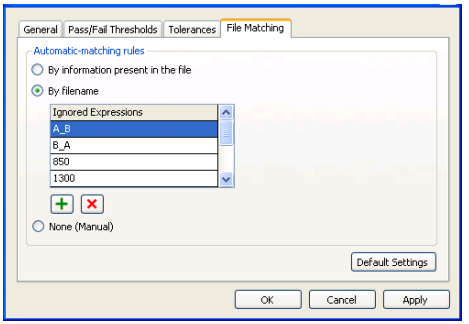
When file matching is set to **None (Manual)**, you can match files manually in the **Matched Files** tab.

Matching Files Manually

The manual file matching mode allows you to decide which files to match in your list.

To match files manually:

1. On the **Project** menu, select **OTDR Properties**.
2. In the **OTDR Project Properties** dialog box, click the **File Matching** tab.

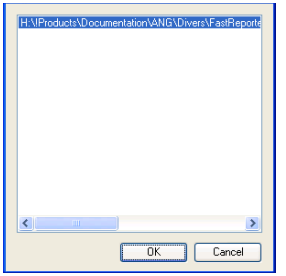


3. Click **None (Manual)**.
4. Click **OK**.

5. In the **Matched Files** tab, select a file in the **File 1** column and drag it into the **File 2** column beside the file to match it to.

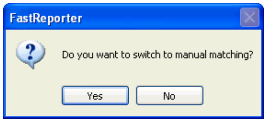
OR

Click in the **File 2** column and click … to display the **File Selection** dialog box, which lists the files that have not yet been matched.



Select a file from the list and click **OK**.

If you attempt to match files manually when **By information present in the file** or **By filename** is selected on the **File Matching** tab, FastReporter will display the following dialog box:



Click **Yes** to switch to manual matching or **No** to cancel the operation.

Creating Bidirectional OTDR Files

Analyzing Bidirectional Measurements

If two OTDR measurements were acquired in opposite directions on the same fiber span, the **Create Bidirectional Files** tool allows you to match the corresponding events. FastReporter performs a bidirectional analysis and generates an event table with the averaged loss for each event; that is, the average of the losses obtained from both directions.

Bidirectional analysis is the recommended method for splice loss measurements on singlemode fibers by the Telecommunications Industry Association (test procedure *EIA/TIA FOTP-61 Measurement of Fiber or Cable Attenuation Using an OTDR*).

This method removes the so-called “gainers” (increase in the optical power) and exaggerated losses and provides accurate measurements. This analysis is particularly useful to test the quality of a link, especially if it comprises several sections with different types of fibers or fiber from different manufacturers.

Gainers and exaggerated losses result from the joining of two fibers of different mode-field diameters (MFD) The mode-field diameter of a fiber corresponds to the size of the area where light is dispersed across its core and cladding.

Mismatch of MFDs will contribute to differences in backreflected signals that are not related to the loss at the splice point, that is to the true loss seen in transmission. In this case, a unidirectional OTDR measurement will show an apparent increase (gainer) or decrease (exaggerated loss) in signal, depending on the direction of measurement.

Bidirectional averaging of OTDR splice loss measurements provides the most accurate splice loss results.

Creating Bidirectional Measurement Files

You can combine unidirectional measurements into a bidirectional measurement file. It is possible to use both single-wavelength and multiwavelength measurements. FastReporter matches the wavelengths.

The A->B and B->A measurement files must respect the following criteria:

Item	To be valid...
Pulse width	Must be identical for both measurement files.
Fiber types	Use only measurements acquired using *singlemode* fibers.
Wavelengths	Must be identical for both measurements.
Measurement file	Both must be unidirectional files.

To create bidirectional files in FastReporter, you must first match A->B files with B->A files. For information on file matching, refer to *Matching Files* on page 65. Changes made to event matching tolerances will effect bidirectional event table results.

To create bidirectional files:

1. In the **Matched Files** window, select the matched OTDR files from which to create bidirectional files.
2. On the **File** menu, point to **Direction**, and click **A->B** or **B->A** to set the direction (if you have not already done so).

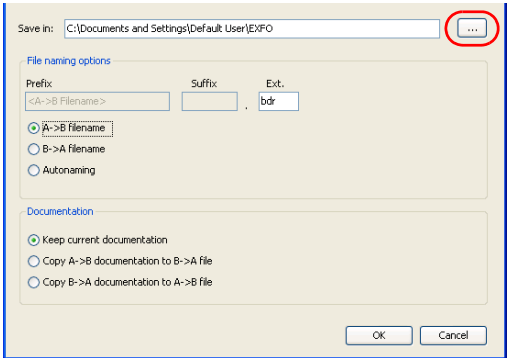
Note: *A B->A file must be matched with an A->B file.*

The bidirectional events are displayed in the event table and on the graph.

3. Save the bidirectional (.bdr) files.

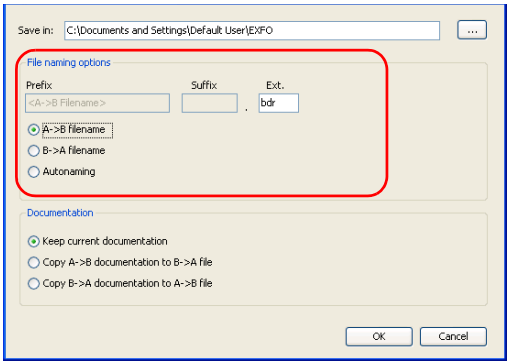
   3a. On the **Tools** menu, point to **OTDR**, and click **Create Bidirectional Files**.

   3b. On the **OTDR Bidirectional File Creation** dialog box, click the ... and select the folder where you want to save the bidirectional files.

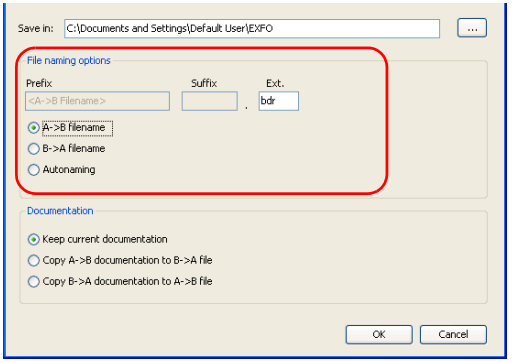


   3c. On the **Browse for Folder** dialog box, click **OK**.

3d. Under **File naming options**, indicate how you want the bidirectional files to be named.



3e. Under **Documentation**, indicate which information you want to keep with the new file.



3f. Click **OK**.

Note: *Bidirectional (.bdr) files do not support multiple wavelengths in the same file. When you save the bidirectional files, separate files will be created for each wavelength. The wavelengths are automatically added.*

Batch Processing

FastReporter includes powerful tools to help automate repetitive operations. These include tools that can be used to batch document or analyze large numbers of OTDR test files.

Batch Documentation

FastReporter's automated documentation tool is not limited to one or two files. It can be used to batch document a large number of files. All Identification information, with the exception of fiber ID, is copied from the reference file to selected files. The automated documentation tool can also be used to automatically assign fiber IDs to selected files.

For details on using the automated documentation tool, refer to *Adding and Removing Measurement Files* on page 23.

Saving an OTDR File in a New File Format

You can save OTDR measurement files in a new file format.

To save OTDR files in a new file format:

1. In the **Measurement** or **Files** window, select the OTDR file or files that you want to save.
2. On the **File** menu, click **Save Selected Files As**.
3. When saving a single file, type a name for the file in the **File name** box.

   OR

   When saving multiple files, click ... on the **Save As** dialog box and select an output folder on the **Browse for Folder** dialog box.
4. In the **Save as type** list, select the appropriate file format.
5. Click **Save**.

Note: *Some file formats (for example, Bellcore and FTB-300) do not support multiple wavelengths in the same file. When saving to those formats, separate files will be created for each wavelength.*

IMPORTANT

If you save an OTDR file in an older format that it was originally in, you will lose the type of data that is not supported by the older file format.

5 Working with OLTS Files

Accepted File Formats

FastReporter lets you work with measurement files saved in different formats, but does not necessarily permit all operations on them.

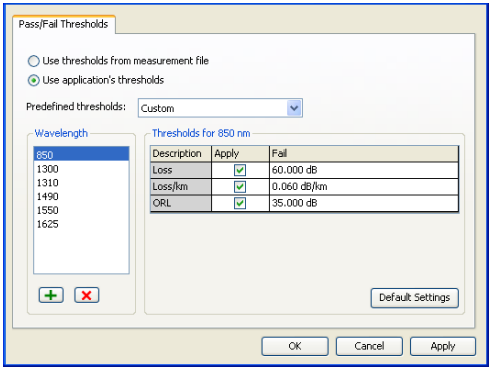
File format	File extension	Display	Modification	Reanalysis
FOT-920, FOT-930	.olts	✓	✓	✓
	.olts2	✓	✓	✓
	.dat	✓	✓	✓
	.oltsx	✓	✓	✓

Changing OLTS Settings

The **OLTS Options** dialog box consists only of the **Pass/Fail Thresholds** tab.

To change OLTS options:

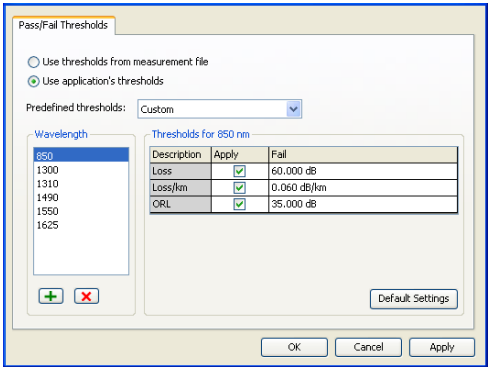
1. On the **Project** menu, select **OLTS Properties**.



2. Select the type of threshold to use for your analysis, either from the measurement file itself or from a list of predetermined thresholds.

➤ The threshold from the measurement file is the one that was used during the actual OL test. When you select this threshold, you cannot modify the values in the threshold table.

➤ The threshold from the application is a threshold set by FastReporter, which you can select and modify.



3. To add a wavelength, click the ⊞ button, enter the wavelength value, and click **OK**.

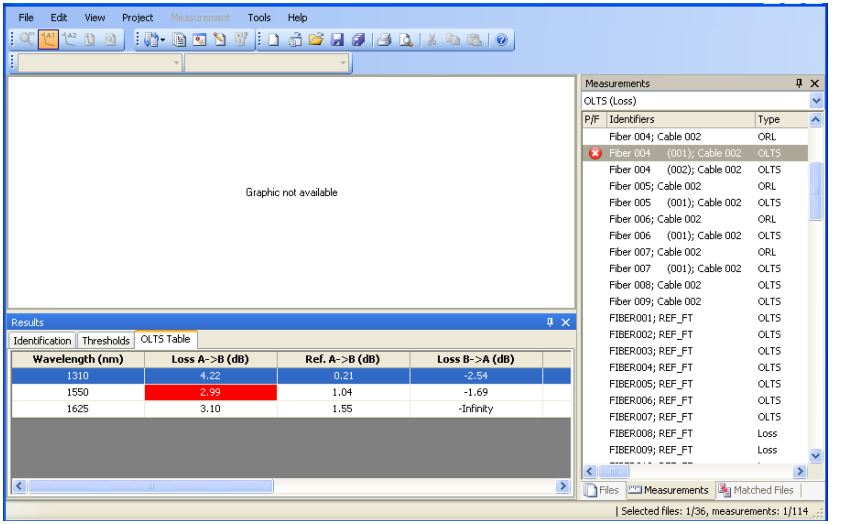
To remove one or more wavelengths, select the values in the **Wavelength** list using the Ctrl or Shift keys as needed, and click the ⊠ button.

Each wavelength can have different thresholds. If you have selected the custom thresholds, you can modify the values. The **Apply** option must be enabled for the values to be active and modifiable.

If you select more than one wavelength in the list, any modification to the thresholds will apply to all of the selected wavelengths.

4. To apply the changes without closing the dialog box, click **Apply**. To apply the changes and close the dialog box, click **OK**.

You can view the results for in the **OLTS Table** tab in the main window.



6 Working with CD Files

Accepted File Formats

FastReporter lets you work with measurement files saved in different formats, but does not necessarily permit all operations on them.

File format	File extension	Display	Modification	Reanalysis
EXFO CD (FTB-5800 modules)	.exfocd	✓	✓	✓
CDPMD (FTB-5700 modules)	.cdpmd	✓	✓	✓

Note: *The .cdpmd file may also contain fiber length and PMD information.*

Note: *When you modify information or data that is common to both CD and PMD formats in .cdpmd files, the contents is automatically updated in both measurement types.*

Changing CD Settings

The pass/fail thresholds that you set for CD projects are displayed on the **Summary** tab in the **Results** window. Should you need to change the wavelength measurement range for analysis purposes, this is also done in the **Summary** tab.

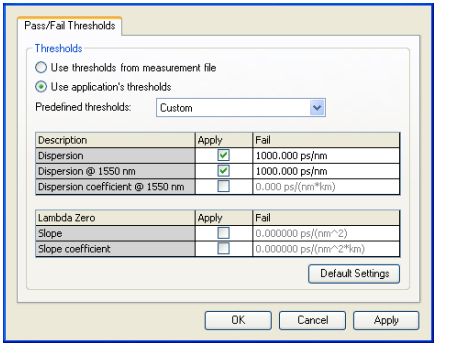
The dispersion thresholds are applied on the maximum dispersion for the measurement file and on each dispersion value of the CD table.

To change CD options:

1. On the **Project** menu, select **CD Properties**.
2. Select the type of threshold to use for your analysis, either from the measurement file itself or from a list of predetermined thresholds.

   ➤ The threshold from the measurement file is the one that was used during the actual CD test. When you select this threshold, you cannot modify the values in the threshold table.

   ➤ The threshold from the application is a threshold set by FastReporter, which you can select and modify.

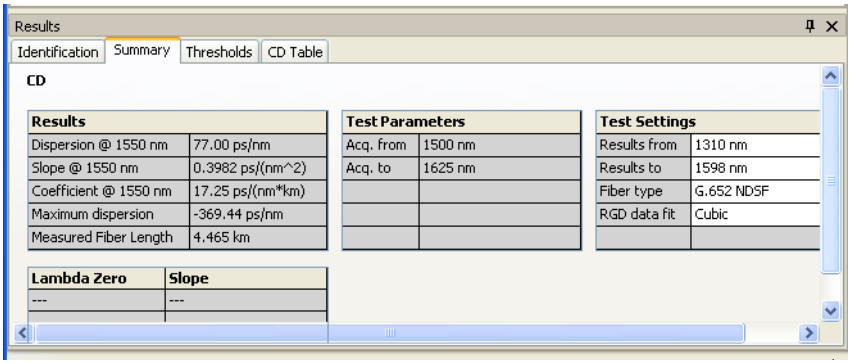


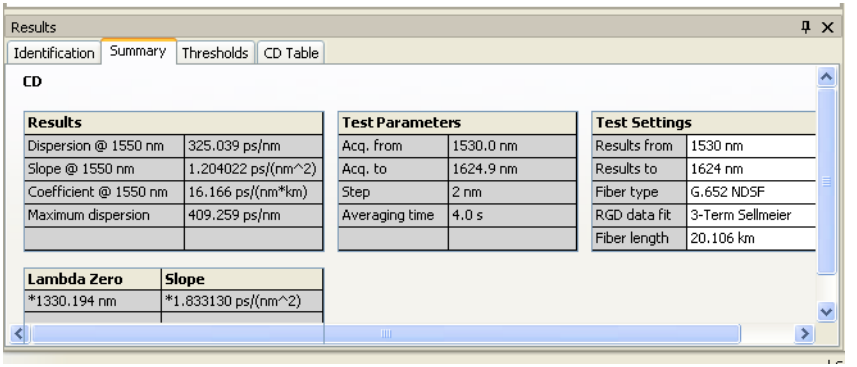
3. Modify the displayed values as needed. The **Apply** option must be enabled for the values to be active and modifiable.

4. To apply the changes without closing the dialog box, click **Apply**. To apply the changes and close the dialog box, click **OK**.

The thresholds are displayed in the main window, in the **Summary** tab, under **Results**. If some values failed the test, they will appear clearly in red.

Note: *The first figure illustrates the display for a .cdpmd file, and the second for an .exfocd file.*

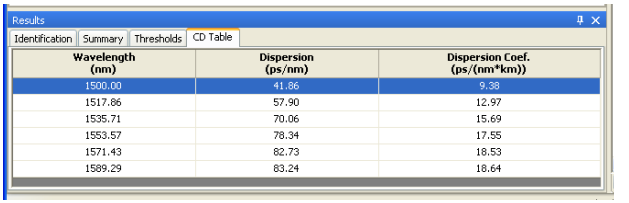




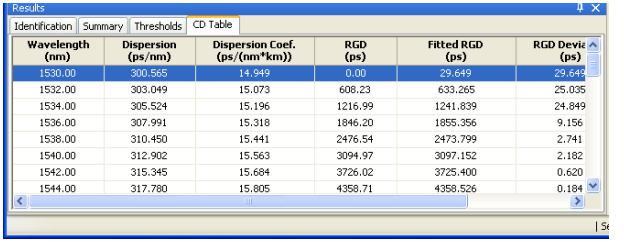
You can view the details for your measurement file in the **CD Table** tab. Depending on the type of CD measurement file you are viewing (.exfocd or .cdpmd), the available information differs. Any failed measurement will also show in this tab.

Note: *RGD measurements are only available in .exfocd files.*

Note: *If you do not see the **CD Table** tab, make sure you have selected only one measurement in the list.*



.cdpmd file



.exfocd file

It is possible for you to change the table wavelength, that is the way to calculate the table according to the Results from and Results to values. You can select from the table wavelength values below.

- 1 nm (Results range with a step of 1 nm in-between values)
- 50 GHz
- 100 GHz
- 200 GHz

To change the wavelength table:

1. From the main window, select the **View** menu, then **CD** > **Table Wavelength**.
2. Select the value you want to use.

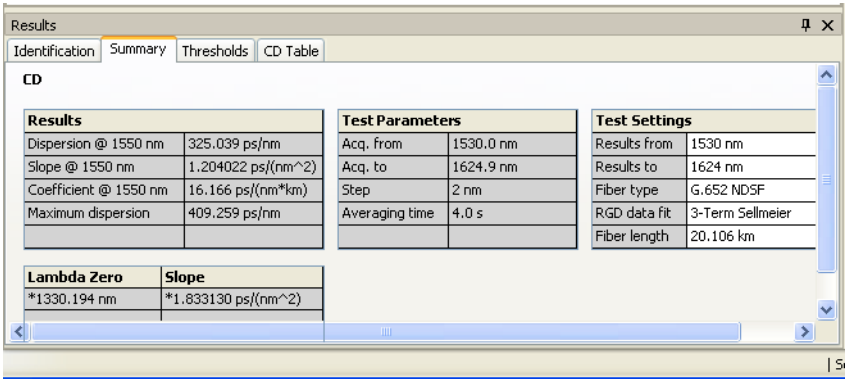
   If a file is opened already, the values are automatically updated.

Changing CD Fiber Type

FastReporter allows you to analyze various fiber types for chromatic dispersion.

To change the CD fiber type:

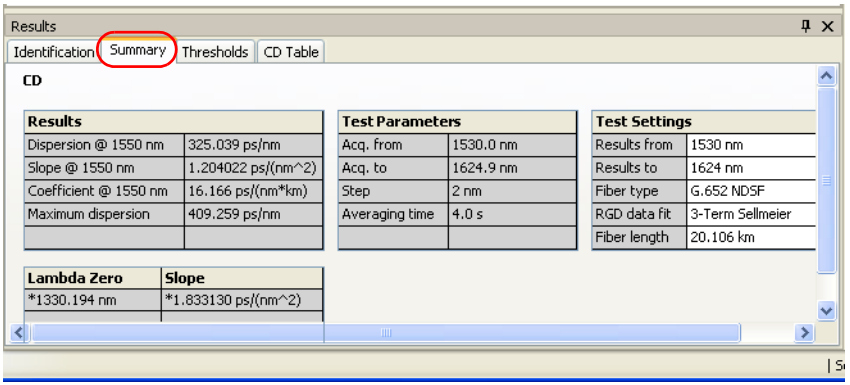
1. Open a CD measurement file.
2. Select the measurement for which you want to change the fiber type. You can select more than one using the Ctrl and Shift keys.
3. In the main window, select the **Summary** tab.



4. Select the fiber type according to your needs in the **Fiber Type** box:

- G.652 NDSF (3-term Sellmeier fit)
- G.653 DSF (quadratic fit)
- G.655 NZDSF (quadratic fit)
- G.656 Wideband NZDSF (quadratic fit)
- Compensating (quadratic fit)
- Flattened (cubic fit)
- Amplified Links (cubic fit)
- Custom (default cubic fit)

Note: *When you select a different fiber type, the fit is automatically changed to match the default fit value for this new fiber type. However, you can change this new fit type as desired in the corresponding list.*

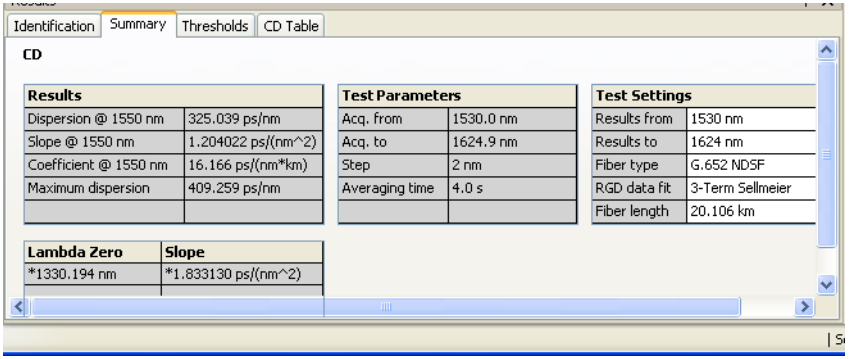


Changing Analysis Range

The range used for taking the measurement and the range used for analyzing the results can be different if you want to concentrate your analysis on a specific area. You can change it for both types of CD files.

To change the analysis range (results from and results to values):

1. Open a CD measurement file.
2. Select the measurement for which you want to change the analysis range. You can select more than one using the Ctrl and Shift keys.
3. In the main window, select the **Summary** tab.



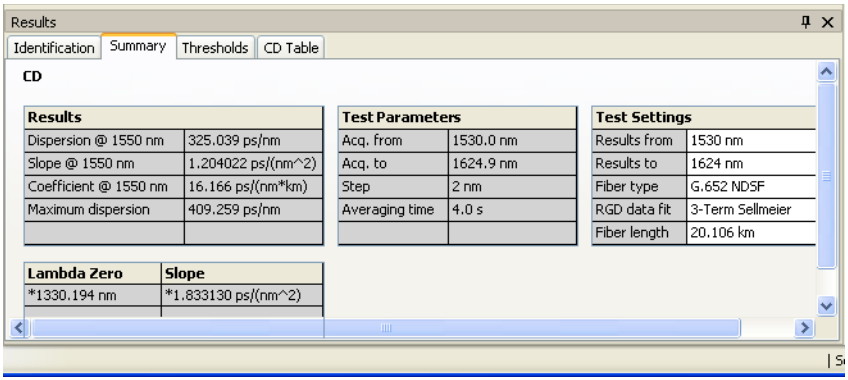
4. In the **Results from** and **Results to** boxes, change the wavelength range values as needed for your analysis.

Changing the Fiber Length

If you are working with an .exfocd format file, you can change the fiber length to obtain more precision in your analysis.

To change the fiber length:

1. Open a CD measurement file.
2. Select the measurement for which you want to change the fiber length. You can select more than one using the Ctrl and Shift keys.
3. In the main window, select the **Summary** tab.



4. In the **Fiber Length** box, enter a new value for the analysis.

Note: *If your file is in .cdpmd format, the fiber length was measured automatically during the measurement and cannot be edited.*

Toggling Between Curve Types

If you have a specified fiber length in your CD file, you can view either the chromatic dispersion or the chromatic dispersion coefficient curves.

To toggle between the coefficient and dispersion curves:

From the main window, select **View** > **CD** > **Coefficient**.

The table values in the **Summary** tab are updated automatically.

7 Working with PMD Files

Accepted File Formats

FastReporter lets you work with measurement files saved in different formats, but does not necessarily permit all operations on them.

File format	File extension	Display	Modification	Reanalysis
PMD (FTB-5500 modules)	.pmd	✓	✓	✓
PMDB (FTB-5500 modules)	.pmdb	✓	✓	✓
CDPMD (FTB-5700 modules)	.cdpmd	✓	✓	✓

Note: *The .cdpmd file may also contain fiber length and CD information.*

Note: *When you modify information or data that is common to both CD and PMD formats in .cdpmd files, the contents is automatically updated in both measurement types.*

Changing PMD Settings

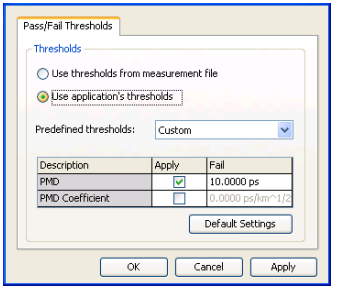
The **PMD Options** dialog box consists only of the **Pass/Fail Thresholds** tab.

To change PMD options:

1. On the **Project** menu, select **PMD Properties**.
2. Select the type of threshold to use for your analysis, either from the measurement file itself or from a list of predetermined thresholds.

   ➤ The threshold from the measurement file is the one that was used during the actual PMD test. When you select this threshold, you cannot modify the values in the threshold table.

   ➤ The threshold from the application is a threshold set by FastReporter, which you can select and modify.

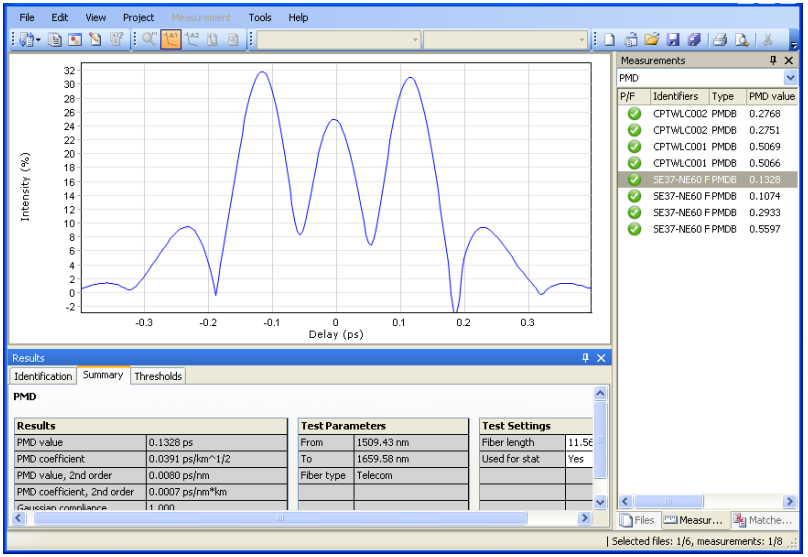


3. Modify the displayed values as needed if you selected to use a threshold from the application. The **Apply** option must be enabled for the values to be active and modifiable.

4. To apply the changes without closing the dialog box, click **Apply**. To apply the changes and close the dialog box, click **OK**.

The thresholds are displayed in the main window, in the **Summary** tab, under **Results**. If some values failed the test, they will appear clearly in red.

Note: *The .cdpmd files do not display a graph for the PMD measurement.*

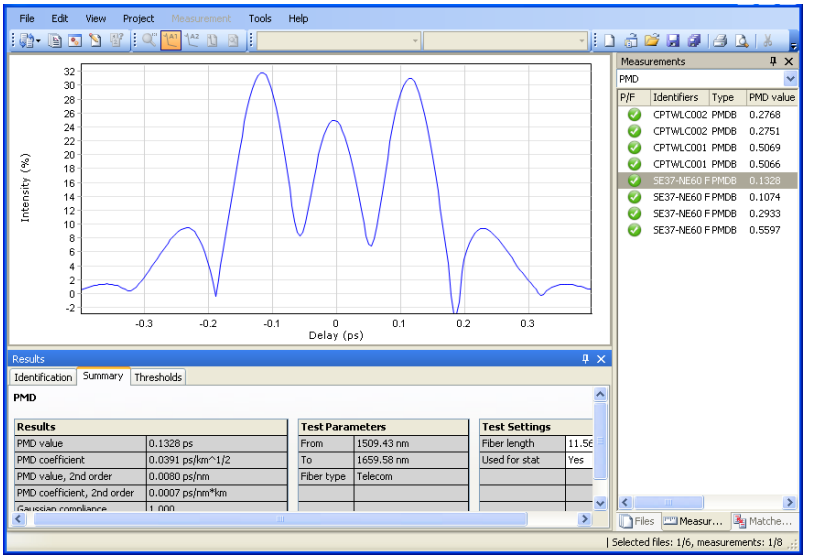


Changing Fiber Length

If you are working with .pmd or .pmdb files, you can change the fiber length to obtain more precision in your analysis.

To change the fiber length:

1. Open a PMD measurement file.
2. Select the measurement for which you want to change the fiber length. You can select more than one using the Ctrl and Shift keys.
3. In the main window, select the **Summary** tab.



4. Locate the fiber length value under **Test Settings** and modify it as needed.

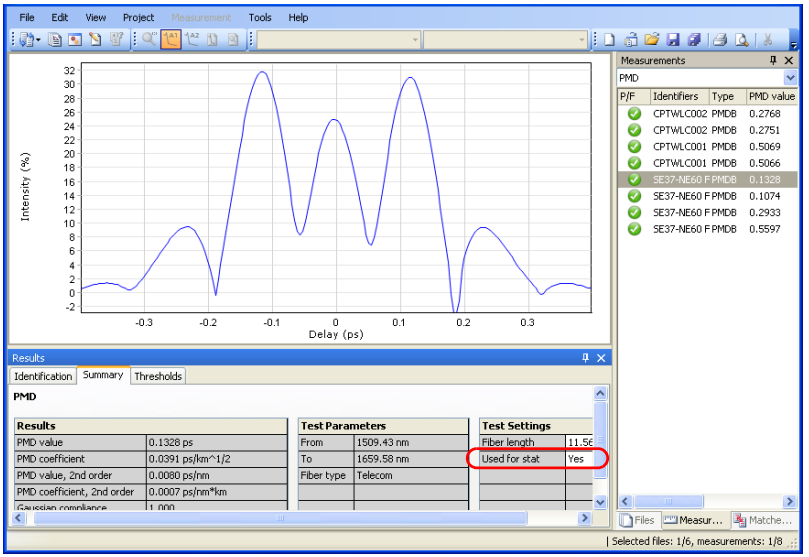
Note: *If your file is in .cdpmd format, the fiber length was measured automatically during the measurement and cannot be edited.*

Working with PMD Statistic Measurements

When selecting more than one PMD measurements on a same file, the **Statistics** tab appears. This tab can be used to see average values for the measurements.

To exclude a measurement from the statistic values:

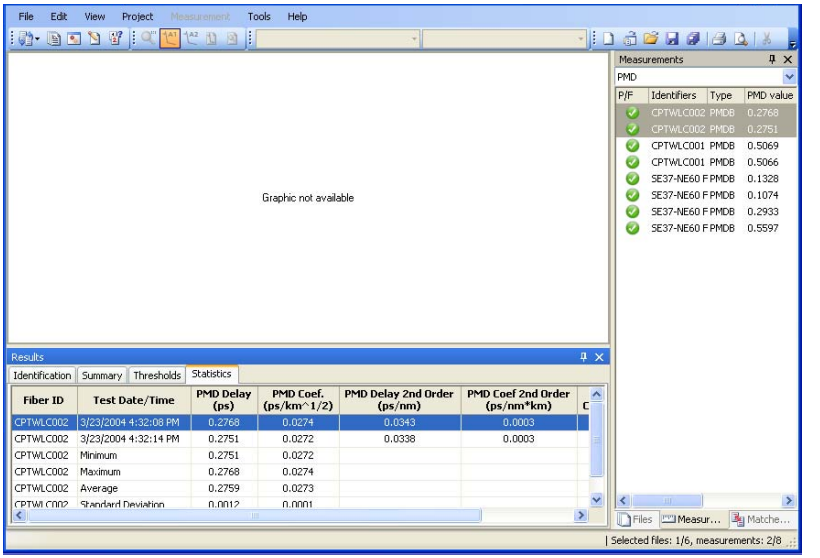
1. Open a PMD measurement file.
2. Select the measurement which you want to exclude from the statistics values. You can select more than one using the Ctrl and Shift keys.
3. In the main window, select the **Summary** tab.



4. Select whether the measurement is used for the statistics under **Test Settings**.

To view PMD measurement statistics:

1. Open a .pmdb measurement file.
2. Select more than one measurement to make the tab appear.
3. In the main window, select the **Statistics** tab.



8 Working with OPM/PPM Measurements

Accepted File Formats

FastReporter lets you work with measurement files saved in following formats, but does not necessarily permit all operations on them.

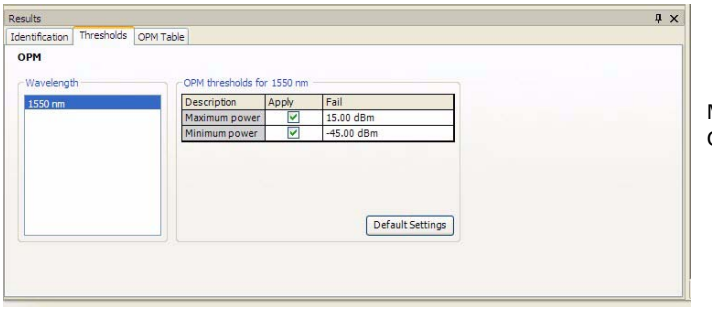
File format	File extension	Display	Modification	Reanalysis
PPM-350 C	.ppm	✓	✓	✓
iOLM	.iolm	✓	✓	✓

Changing OPM/PPM Settings

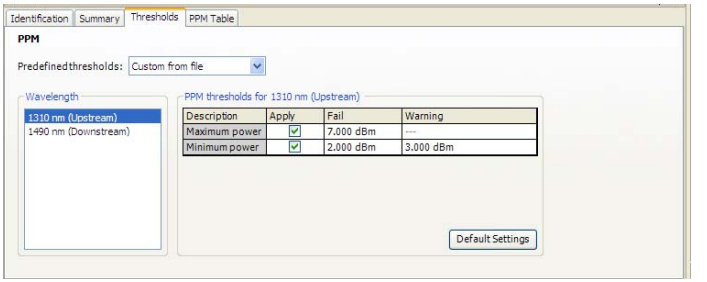
The pass/fail thresholds that you set for PPM/OPM projects and the predefined thresholds are applied on the **PPM Table** or **OPM Table** tab in the **Results** window. If you need to change the threshold for analysis purposes, it can be done in the **Thresholds** tab.

To change OPM/PPM settings:

1. Open the file which contains OPM/PPM measurements.
2. On the **Results** window, click the **Thresholds** tab.



Measurement: OPM



Measurement: PPM

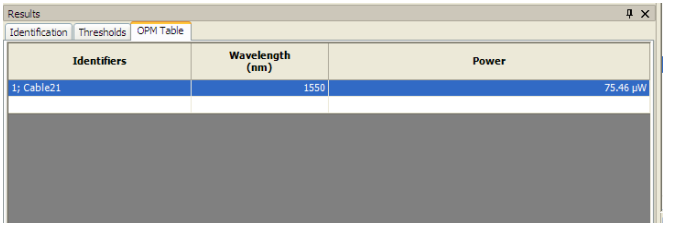
3. Select a wavelength or wavelengths to modify using the **Ctrl** or **Shift** keys.
4. Modify the thresholds associated with the wavelengths needed by clicking in the desired threshold value and modifying it in the table. If you have selected more than one wavelengths, all of them will be modified at the same time.

Power Meter Results

Power meter results are displayed in the OPM and PPM table.

To view the Power meter results for OPM measurements:

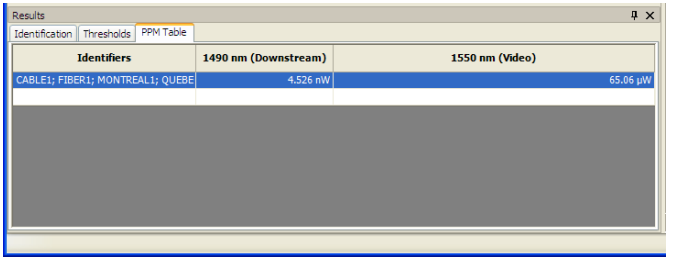
1. Select OPM measurements.
2. From the **Results** window, select **OPM** table.



3. In the OPM Table, the following information is displayed.
   - Identifiers
   - Wavelength
   - Power

To view the Power meter results for PPM measurements:

1. Select the file which contains PPM measurements.
2. From the **Results** window, select **PPM** table.



In the **PPM Table**, you can view the **Identifiers** and power for available wavelengths.

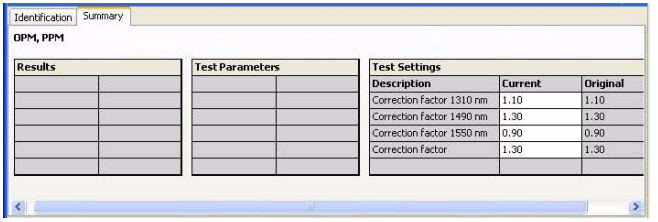
Changing Correction Factor

Correction factors are used to adjust the Optical Power Meter (OPM) and PON Power Meter (PPM) measurements. The Correction factor is specified by wavelength only, and the fiber core size is not taken into account. FastReporter allows you to change the correction factor for PPM file types. These corrections should be made before the measurement is taken and should be stored with each measurement. A correction factor of 1.0 has no effect on the measurement.

Note: ***Correction factor*** *is not available for measurements from iolm files.*

To change Correction Factor:

1. Open a PPM or an OPM measurement file.
2. Select the measurements for which you want to change the correction factor. You can select more than one using the **Ctrl** and **Shift** keys.
3. In the **Results** window, select the **Summary** tab.



4. Modify the correction factors associated with the wavelengths as needed. Click the desired correction factor value under **Test Settings** column and modify it.

9 Working with FIP files

Accepted File Formats

FastReporter lets you work with measurement files such as saved in following formats, but does not necessarily permit all operations on them.

File format	File extension	Display	Modification	Reanalysis
FIP	.cmax	✓	✓	×

FastReporter supports the above FIP measurement file format including:

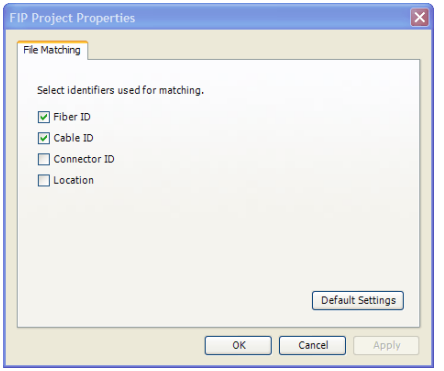
- Inspection of single-fiber connectors
- Analysis of single-fiber connectors
- Inspection of multiple-fiber connectors

Matching Files

FastReporter allows you to match FIP files in projects based on the identifiers used. The four identifiers available for matching files are Fiber ID, Cable ID, Connector ID, and Location. By default, Fiber ID and Cable ID option is selected. The application will match a FIP measurement with other FIP measurement(s) only when the identifier caption and their values selected for matching, are same for both measurements.

To match FIP files using identifiers:

1. On the **Project** menu, select **FIP Properties**.



2. From the **FIP Project Properties** window - **File Matching** tab, select the identifiers for matching files.

   By default, **Custom Identifiers** and **Cable ID** will be selected.

3. To return the file matching configuration back to their original setting, click **Default Settings**.

4. To apply the changes without closing the dialog box, click **Apply**. To apply the changes and close the window, click **OK**.

Setting FIP Thresholds Table Options

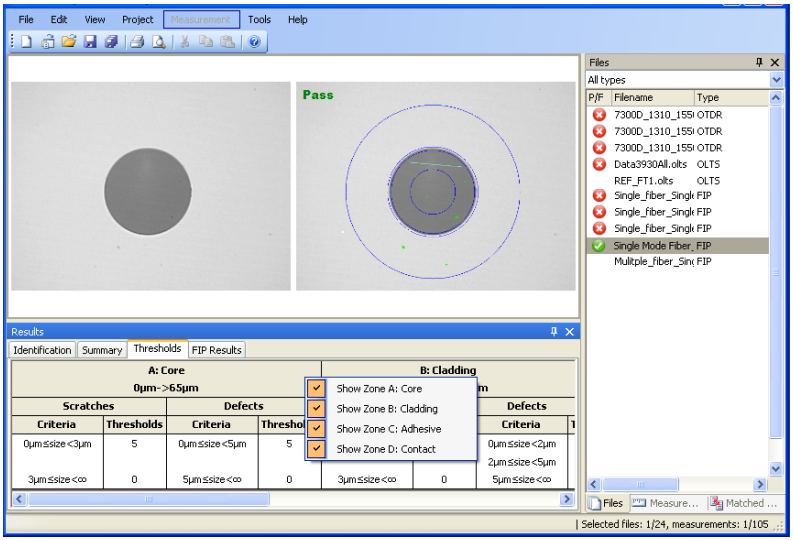
You can hide specific zone information displayed in the FIP **Thresholds** table. Threshold details cannot be edited from the **Results** window.

To set FIP thresholds table view options:

1. On the **View** menu, select **FIP**.

   OR

   On the main window, in the **Thresholds** tab of the **Results** window, click the right mouse button.



2. Select or clear any of the following threshold view options:

View Option	Description
Show Zone A: Core	Displays or hides Zone A, Core threshold details
Show Zone B: Cladding	Displays or hides Zone B, Cladding threshold details
Show Zone C: Adhesive	Displays or hides Zone C, Adhesive threshold details
Show Zone D: Contact	Displays or hides Zone D, Contact threshold details

Setting FIP Results Table Options

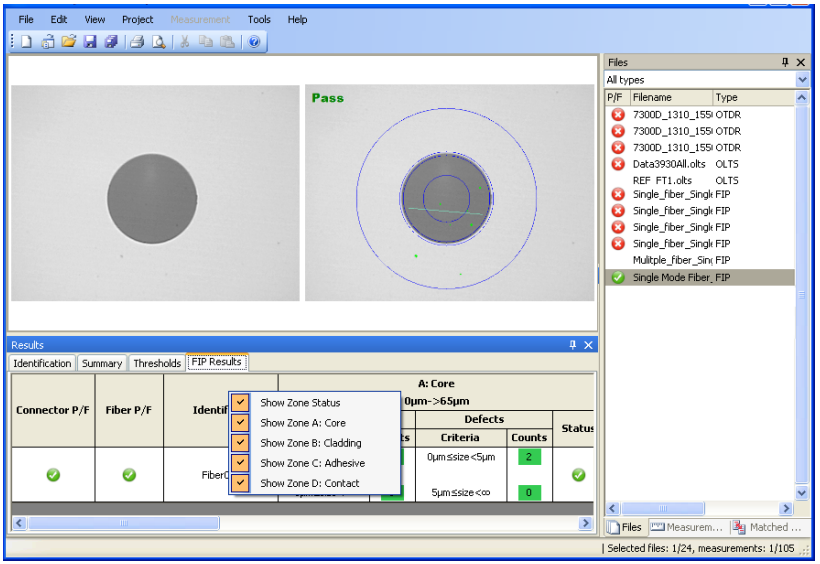
You can hide specific zone information displayed in the **FIP Results** table. FIP results details cannot be edited from the **Results** window.

To set FIP Results table view options:

1. On the **View** menu, select **FIP**.

   OR

   On the main window, in the **FIP Results** tab of the **Results** window, click the right mouse button.



2. Select or clear any of the following results view options:

View Option	Description
Show Zone Status	Displays or hides Pass/Fail status of all each zone. By default, this option is not selected.
Show Zone A: Core	Displays or hides Zone A, Core result details
Show Zone B: Cladding	Displays or hides Zone B, Cladding result details
Show Zone C: Adhesive	Displays or hides Zone C, Adhesive result details
Show Zone D: Contact	Displays or hides Zone D, Contact result details

Note: *Table view options set for the **Results** page will be applied to the **Thresholds** tab and vice versa.*

Note: *Changes in the table view option settings will be applied next time when you start the application.*

FIP Graphic Display Options

Your FastReporter application displays the FIP overlay in the graphics window along with the FIP Image. An Overlay highlights the inconsistencies in your FIP with different colors described below.

Color Legend	Analysis Anomaly Highlighting
Aqua	PASS Scratch
Green	PASS Defect
Red	FAIL Anomaly

- FAIL Anomaly: the presence of this anomaly implies automatically a FAIL result.
- PASS Anomaly: the presence of this anomaly is not sufficient to confirm a FAIL, the anomaly count in this case is relevant.

Image is available only when single FIP measurement is selected. When multiple FIP measurements are selected, the window remains blank. Your FastReporter application also allows copying the FIP Image and/or Overlay and pasting it to the clipboard.

You can also change the display setting of graphics for FIP measurements.

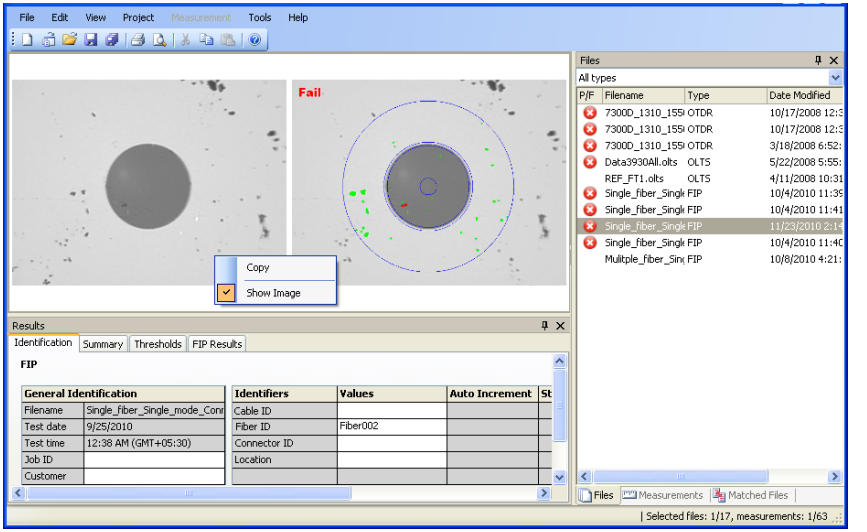
To change FIP graphic display options:

1. On the **View** menu, select **FIP** to display the FIP graphic display options.

   OR

   On the graphic itself, click the right mouse button to display the FIP graphic display options on the shortcut menu.

2. Select or clear **Show Image** option. The FIP image will be displayed exactly next to the Overlay in the graphics window if the **Show Image** option is activated.



10 Working with iOLM files

Accepted File Formats

FastReporter lets you work with measurement files saved in following formats, but does not necessarily permit all operations on them.

File format	File extension	Display	Modification	Reanalysis
iOLM	.iolm	✓	✓	✓
	.iolmcfg	✓	✓	✓

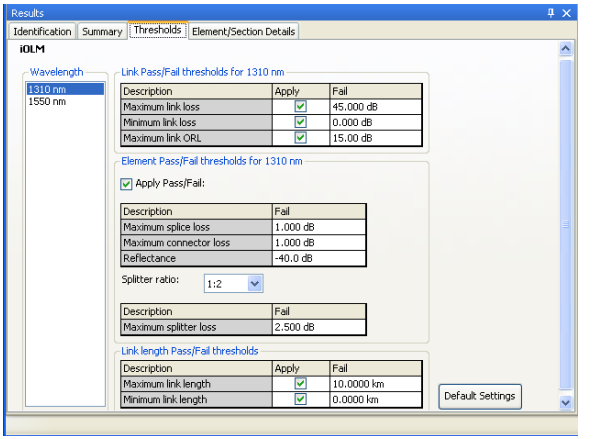
Viewing and Modifying iOLM Thresholds

In the **Thresholds** tab for iOLM file you can view and modify the Link Pass/Fail thresholds values, and Element Pass/Fail thresholds values.

To view and modify the iOLM Thresholds:

1. Open an iOLM file.
2. Select the measurement for which you want to view or modify the thresholds. You can select more than one measurements using the **Ctrl** or **Shift** keys.

3. In the **Results** window, select the **Thresholds** tab.



4. Select the wavelength for which you want to view or modify the Link Pass/Fail thresholds and Element Pass/Fail thresholds values. You can select more than one using the **Ctrl** or **Shift** keys.

5. Under **Link Pass/Fail thresholds**, modify the thresholds associated with the wavelengths needed by clicking in the desired threshold value and modifying it in the table. The **Apply** option must be enabled for the threshold to be active and editable.

Note: *If you have selected more than one wavelength, all of them will be modified at the same time.*

6. Under **Element Pass/Fail thresholds**, modify the thresholds associated with the wavelengths needed by clicking in the desired Element Pass/Fail threshold value and modifying it in the table. The **Apply Pass/Fail** option must be enabled to modify and apply all the Element Pass/Fail thresholds values.

7. Select the splitter ratio from the **Splitter ratio** field to view or modify respective **Maximum splitter loss** value.

8. Under **Link length Pass/Fail thresholds**, view or modify the Link Length Pass/Fail thresholds value by clicking the desired threshold value and modifying it in the table. The **Apply** option must be enabled for the threshold to be active and editable.

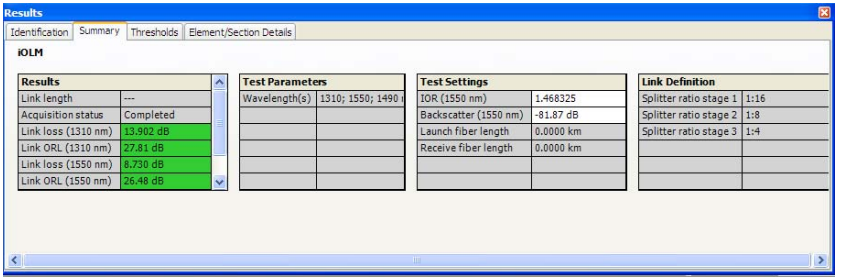
9. If you want to apply the default values for the selected wavelength(s), press **Default Settings**.

Viewing and Modifying iOLM Settings

In the **Summary** tab you can view and modify the **IOR** and **Backscatter** value for iOLM measurement.

To view and modify iOLM settings in the Summary tab:

1. Open an iOLM file.
2. Select the measurement for which you want to view or modify the iOLM settings. You can select more than one using the **Ctrl** or **Shift** keys.
3. In the **Results** window, select the **Summary** tab.



4. In the Results table all the results components, such as **Link length**, **Acquisition Status**, **Link loss**, and **Link ORL**.

   - **Link length**: Displays the Link length.
   - **Acquisition Status**: Displays the status of acquisition. It displays if the acquisition has been taken normally or if it is interrupted.
   - **Link loss**: Displays the Link loss.
   - **Link ORL**: Displays the Link ORL value.

Note: *If the link ORL value is saturated, that is, the value is displayed with a "<" symbol, the value will be tested for Pass/Fail and it will be able to specify the fail status if the value is fail, but it will not be able to specify the pass status.*

5. In the **Test Settings** table, modify the **IOR** and the **Backscatter** value as needed.

Note: *The values set for 1550nm are automatically computed for other wavelengths. You can edit the IOR and Backscatter for only 1550nm wavelength irrespective of the wavelengths available in the selected iOLM measurement.*

Note: *When the IOR value is changed the position and length of the section will be updated, and when the Backscatter value is changed it will trigger reanalysis of the whole link.*

Link Definition

The **Link Definition** table displays the information about the expected number of splitter on the link and their respective split ratio. You can modify the Link Definition table in the iOLM configuration file which can be used by online application to take new acquisition.

Note: *Link definition on an iOLM measurement is available for display, but is read-only.*

To view and modify the Link Definition table:

1. Open an iOLM configuration file. You can select more than one using the **Ctrl** or **Shift** keys.
2. In the **Results** window, select the **Summary** tab.
3. You can view and modify the **Splitter ratio stage 1**, **Splitter ratio stage 2**, and **Splitter ratio stage 3** field in the **Link Definition** table.
4. You can view select **1:?** if you know that a splitter is present, but you don't know it's splitter ratio. The iOLM will discover the splitter ratio automatically and the element will not be tested for pass/fail. When the split ratio for the first stage of splitter is set to "**None**", you can not set the second and third one to something different than "**None**", and if the second stage of splitter is defined as "**None**", the third one can't be set to something else than "**None**", but the first one can still be set to anything.

Note: *The splitter ratios are defined stage wise, depending on how they are defined in the network.*

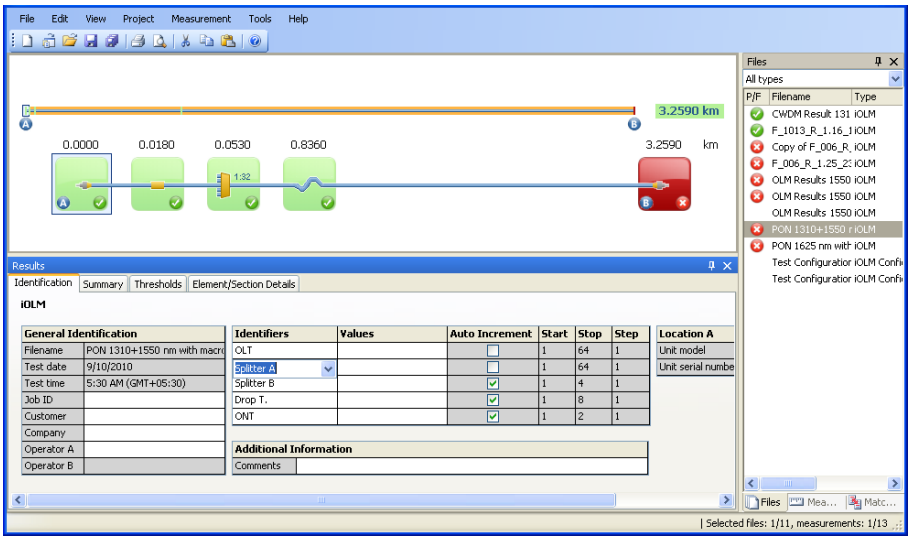
Viewing and Modifying Identifier Labels

The OLM identification information and identifiers are displayed in **Identification** tab. You can view and modify the label of the identifiers.

Note: *When multiple OLM measurements are selected the Identification tab will show the information for all selected measurements. If the values are same, they will be displayed only once. If the values for the selected measurements are different, they will be displayed as semi-colon separated.*

To view and modify the Identifier Labels:

1. Open an iOLM file.
2. Select the measurement for which you want to view or modify the Identifier labels. You can select more than one using the **Ctrl** or **Shift** keys.
3. In the **Results** window, select the **Identification** tab.



4. Select the Identifier from the list of available choices in the **Identifiers** table to modify it. You can also rename the identifier by selecting it. You can modify the values for it in the **Values** column.

Note: *The identifiers label is not editable, if iolm measurements are selected with any other type of measurements like CD or OTDR.*

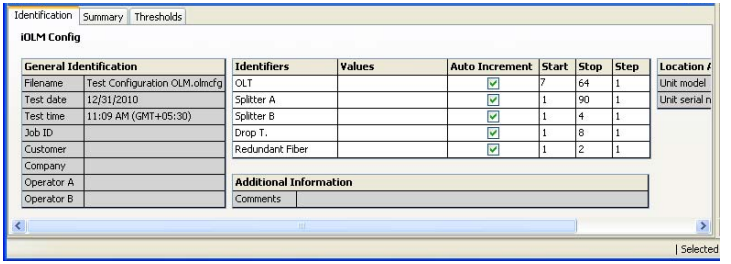
Note: *When the Identifier label is selected as **None**, the values are not editable.*

Modifying Auto-Increment Values

You can modify the Auto-Increment values in the iOLM configuration file only.

To modify the Auto-Increment values:

1. Open an iOLM configuration file.
2. Select the measurement for which you want to modify the auto increment values. You can select more than one using the **Ctrl** or **Shift** keys.
3. In the **Results** window, select the **Identification** tab.



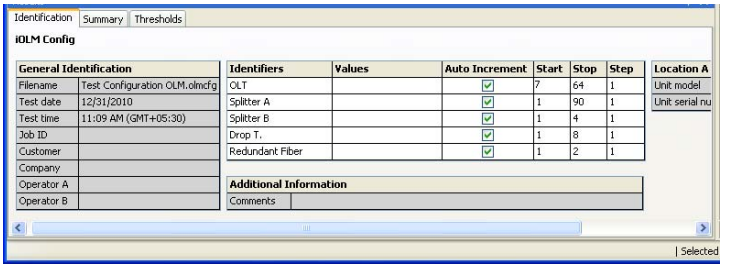
4. Enable the **Auto-Increment** option to modify the **Start**, **Stop**, and **Step** values.

Modifying Start, Stop, and Step Values

You can modify the Start, Stop, and Step values of the iOLM configuration file.

To modify the Start, Stop, and Step values:

1. Open an iOLM configuration file.
2. Select the configuration for which you want to modify the **Start**, **Stop**, and **Step** values. You can select more than one using the **Ctrl** or **Shift** keys.
3. In the **Results** window, select the **Identification** tab.



4. Enable the **Auto-Increment** option to modify the **Start**, **Stop**, and **Step** values.
5. Enter the **Start**, **Stop**, and **Step** values for the identifiers.

Note: *The Step value must be smaller than the difference between the Start and Stop values. If the Start is greater than the Stop, then the identifier value begins decrementing by the specified Step.*

Managing Element

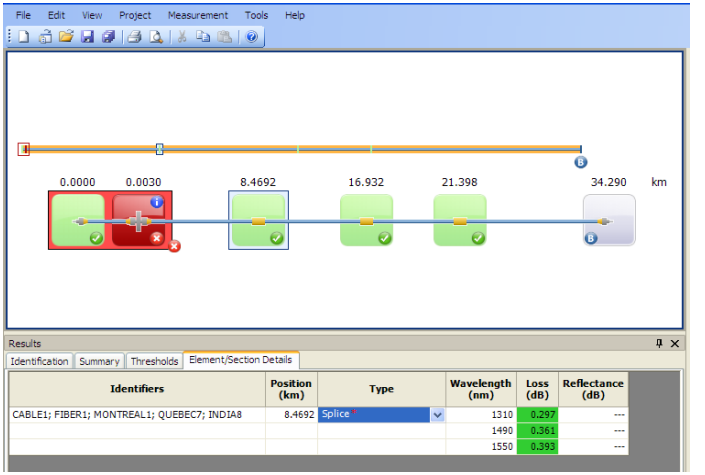
When an element or a section is selected from the Link View, the details of the corresponding element or section are displayed in **Element/Section Details** tab. The loss, reflectance, wavelength, and corresponding pass/fail status for loss and reflectance will be displayed.

Note: *It is possible to underestimate the loss or reflectance value if the noise level is too high (for instance, after a lot of loss on the link, the noise levels increase). In that case, it is possible for the signal processing algorithms to detect an element, and to estimate the loss/reflectance values, but since the measured signal does not completely clear the noise floor, the loss or reflectance values are likely to be underestimated. If the loss or reflectance value is underestimated, the value is displayed with a > symbol.*

Viewing Element/Section details

Under the **Element/Section Details** tab, you can view the following attributes when the element is selected.

➤ **Identifiers** : Displays the identifier value configured in the **Identification** tab.



➤ **Position**: The position of the selected element in the link. The position 0.00 is set on the first element following the launch fiber.

➤ **Type**: The type of element selected in the Link View. You can modify the type of element by selecting the element type from the drop down menu. You can also change the splitter ratio if the selected element is splitter.

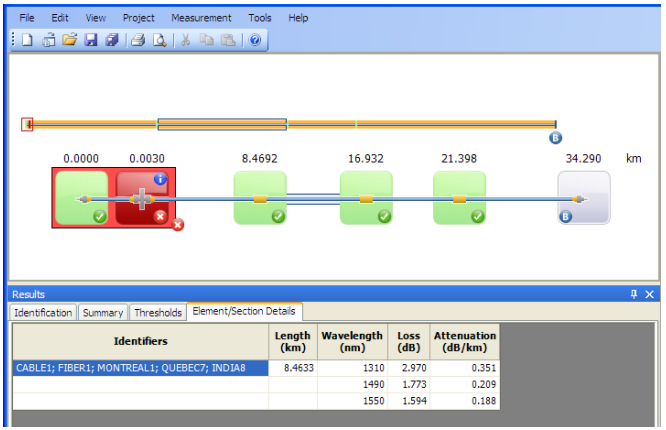
Note: *The items available in the list depends on the characteristics of the selected element. It may not be possible to change the element type.*

Note: *If the type of an element is modified, a "*" sign is displayed at the value in the Type column.*

- **Wavelength (nm)**: The wavelength at which the values have been taken.
- **Loss (dB)**: The loss at different wavelengths.
- **Reflectance (dB)**: The reflectance at different wavelengths.

You can view the following attributes when the section is selected.

- **Identifiers**: Displays the identifier value configured in the **Identification** tab.



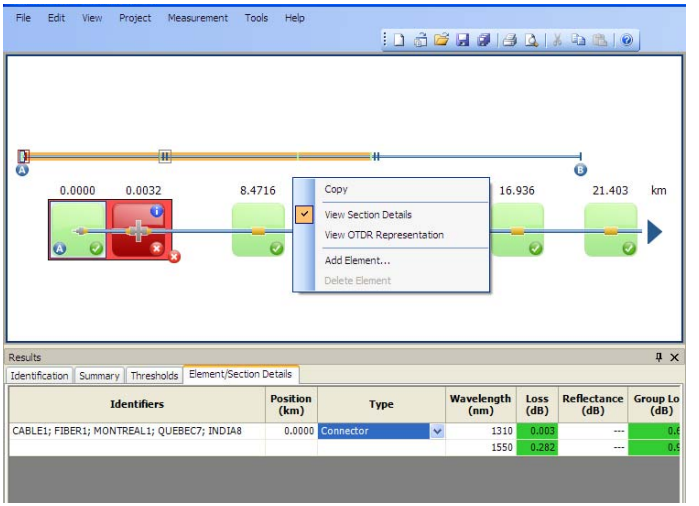
- **Length**: Displays the length of the selected section.
- **Wavelength (nm)**: The wavelength at which the values have been taken.
- **Loss (dB)**: The loss at different wavelengths.
- **Attenuation (dB/km)**: Displays the Attenuation value for each wavelength.

To enable the View Section Details

1. From the **View** menu, select iOLM, and select **View Section Details**.

OR

Right click in the Link View and select **View Section Details**.

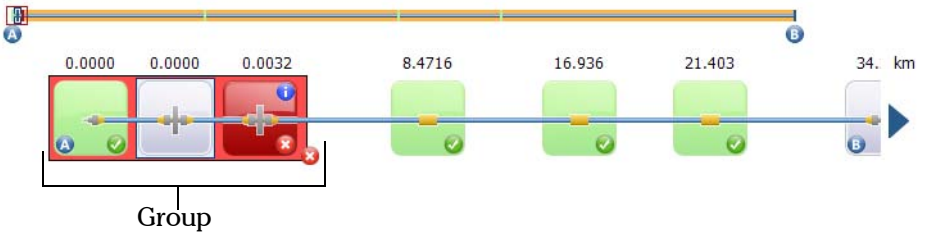


Type of Elements

Element Name	Element Icon	Element Description
Macrobend		Macrobend can be displayed in the link view when more than one wavelength is present in the measurement. ***Note:*** *The macrobend will always be displayed as a failed element.*
Out of Range		The out of range element is displayed when the end of fiber could not be detected by the module because the dynamic range is not large enough.
Splitter		The splitter is a passive fiber optic coupler that divides light from a single fiber into two or more fiber channels. The splitter ratio is displayed above the icon.
Splice		The splice indicates the junction of two fiber sections having different fiber backscatter characteristics.
Connector		The connector is used to join two fibers.

Group Element

Link elements will be displayed as groups when the iOLM analysis detects several link elements that are too close to one another to be independently characterized. When this occurs, as much information as possible will be displayed for each individual sub-element. The pass/fail status is applied to each sub-element whenever possible, and a global status is also displayed for the group. Groups can also be displayed when a link element (such as a splitter) is found to have wavelength dependant loss. In that case, the link element is grouped with a macrobend element. In this particular case, there might not be a physical macrobend next to the link element, but the macrobend icon is used to highlight the presence of the wavelength dependant loss. When elements are grouped, the group loss and group reflectance value is also displayed in the Element tab.



Each sub-element is directly displayed as if they were normal elements. For more details, see add element to group, on page 127.

Note: *For grouped elements, some values may not be available individually but are available at the group level such as loss and reflectance.*

Note: *If some elements are grouped then the total group loss value is compared with the addition of the thresholds defined for the individual elements in group. If the total group loss value is greater than the addition of the thresholds defined for the individual elements in group, the element will show a fail status. You can individually select grouped elements as any other standalone element. When elements are grouped at the beginning of the link, icon A is displayed on one of the sub-elements. When elements are grouped at the end of the link, icon B is displayed on one of the sub-elements.*

Adding Element

In the Link View you can add the required element by selecting any element or section.

Note: *You can select any section if the View Section Details option is enabled.For more information, see Viewing Element/Section details* on page 120.

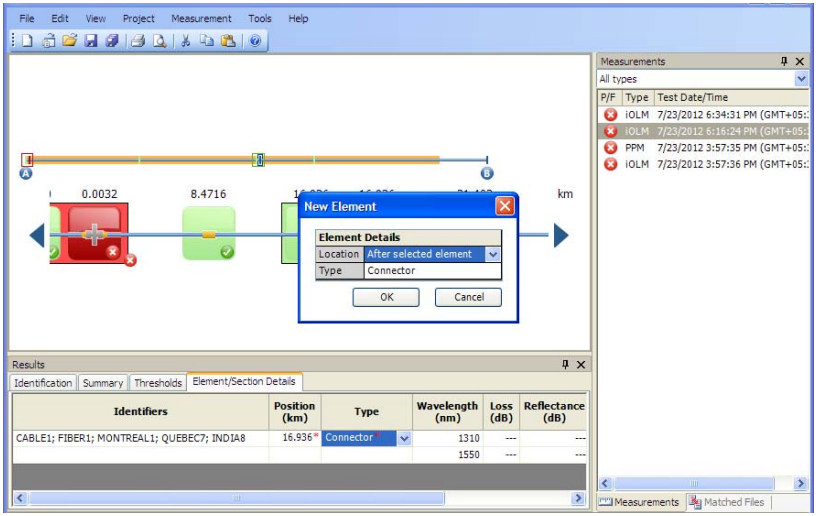
Note: *You can not add any element before first element and after last element.*

To add element:

1. Open an iOLM file.
2. Select the existing element where you want to add the new element, right click on the Link View, and select **Add Element**.

   OR

   Select the existing element where you want to add the new element, from **Measurement** menu select **iOLM**, and **Add Element**.



3. In the **New Element** dialog, configure the **Element Details**.

   3a. You can add the new element after or before the selected element. The position can be selected as required in the **Location** field.

   3b. Select type of the new element as required.

4. Press **OK** to apply the changes or **Cancel** to discard it.

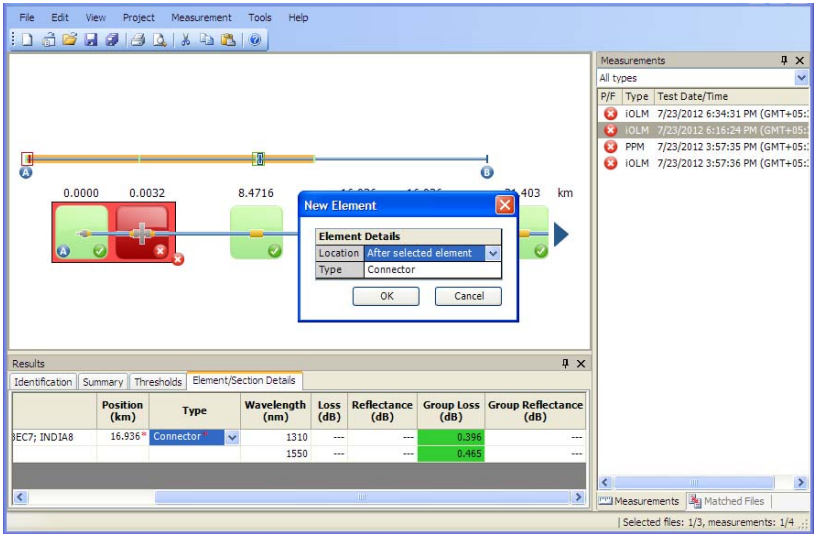
Note: *If an element is added, a '*' sign is displayed at the **Position** and **Type** column.*

To add an element to a group of elements:

1. Open an iOLM file.
2. Select an Element from an existing group of element, where you want to add the new element, right click on the Link View, and select **Add Element**.

   OR

   Select an Element from an existing group of element, where you want to add the new element, from **Measurement** menu select **iOLM**, and **Add Element**.



3. Select the location of the element from the **Location** list, from the **New Element** window.
4. Select the type of element from the **Type** list and click on **OK**.

Note: *When an element is added to another element with no sub-element, the current element will become merged/group element. You can view the details in the element* ***Element/Section Details*** *tab.*

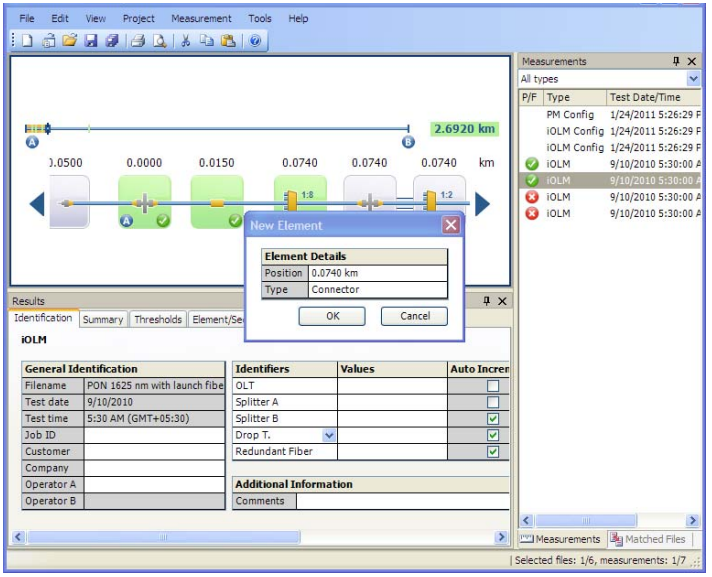
Note: *When you add an element to a group of element, it will make an impact on the pass/fail status of the grouped element.*

To add element on section:

1. Open an iOLM file.
2. Select the required section where you want to add the element. Right click on the Link View, and select **Add Element**.

   OR

   Select the required section where you want to add the element, from the **Measurement** menu, select **iOLM**, and **Add Element**.



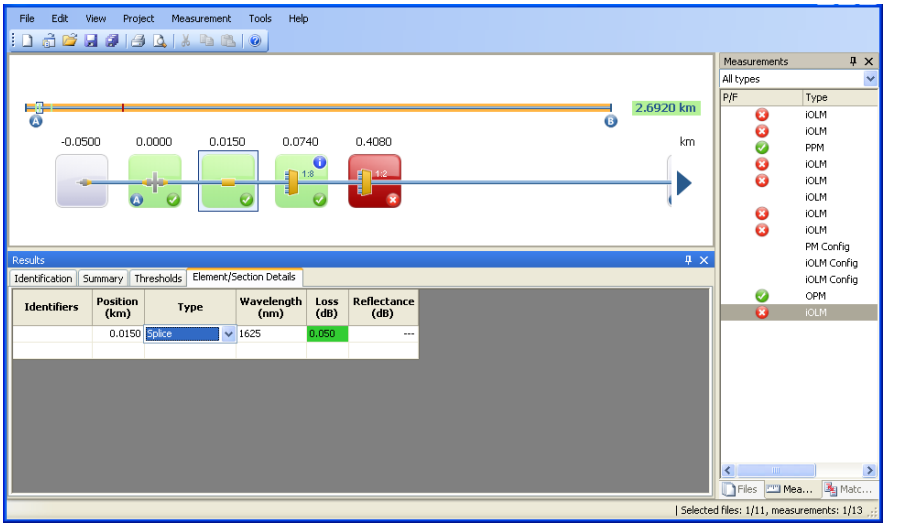
3. Set the position of the new element in the **Position** field as per your requirement.
4. Select the element type in the **Type** list.
5. Press **OK** to apply the changes or **Cancel** to discard it.

Modifying Element Types

In the **Type** column, you can view the type of element selected in the Link View. You can modify the type of element by selecting the element type from the choices.

To modify the Element types:

1. Open an iOLM file.
2. Select the element from the Link View, which you want to modify.
3. Select the required type of element from the drop down menu.



Note: *You cannot modify the type of the element, which are out of range or macrobends.*

Note: *If an element type is changed, a '*' sign is displayed at the* ***Type*** *column.*

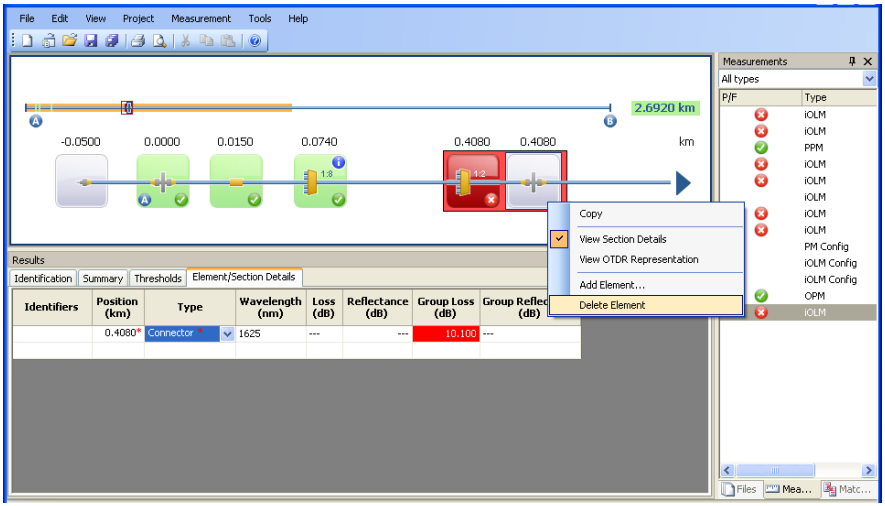
Note: *The items available in the list depends on the characteristics of the selected element. It may not be possible to change the element type.*

Deleting Element

You can only delete the manually added element.

To delete element from Link View:

1. Open an iOLM file.
2. Select element which you want to delete.
3. Right click on the Link View, and press **Delete Element**, or press **Delete** key form the keyboard.



4. A confirmation message is displayed. Press **Yes** to continue or **No** to cancel it.

To delete element from Edit menu:

1. Open an iOLM file, and select element which you want to delete.
2. Press the **Edit** menu and select **Delete**.

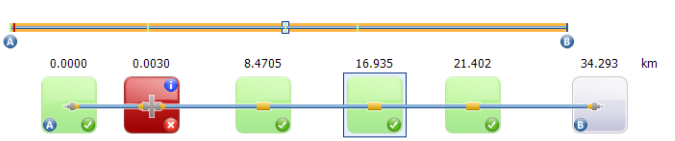
Link View

The iOLM Link View is an intuitive representation, which combines several measurement results and values into a single view.

The Link view is divided into two different regions.

- Link overview
- Link composition.

Link Overview

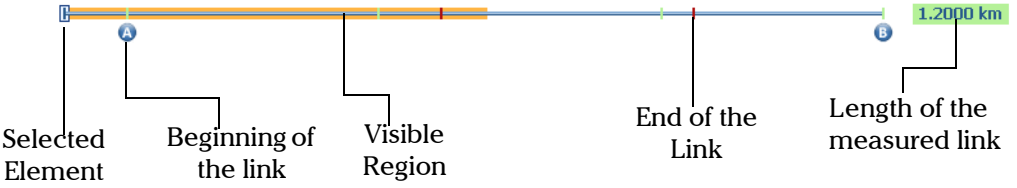


Link Overview

The following color codes are used.

- Red: If element is fail.
- Green: If element is pass.
- Blue: When the element is not tested for Pass/Fail.

The pass/fail status also depends on the threshold values specified.The link overview representing all the elements discovered on the link is described below.

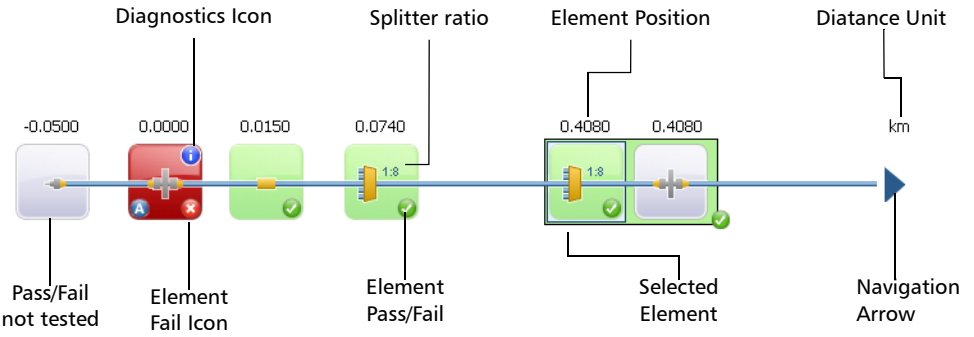


- **Length of the measured link**: Length of the measured link excluding the launch and receive fiber. In other words, the fiber length between point A and point B.
- **Selected Element**: Rectangle representing the selected element.
- **Visible region**: The colored background represent the visible region in the Link Composition view.
- **Beginning of the link**: Beginning of the link under test.
- **End of the link**: End of the link under test.

Elements before A and after B are referred to as out of span elements. Elements out of the span are not tested for pass/fail status, but can have diagnostics on them. If the launch fiber is not defined, the element marked as "A" will not be tested for pass/fail and if the receive fiber is not defined, the element marked as "B" will not be tested for pass/fail.

Link Composition

The link composition is described below.



- **Element position**: The distance of the element from the beginning of the link under test.
- **Navigation Arrow**: The navigation arrow is only displayed when more items are available on the particular side. It indicates that the user has to scroll to view those items. This arrow can also appear on the left side.
- **Selected Element**: The gray background represents the currently selected element.
- **Letter A**: The letter represents the beginning of the link under test.
- **Letter B**: The letter represents the end of the link under test.

Note: *An arrow ( ) icon is displayed on the element, if the start and the end of the link is represented by the same element.*

- **Element Pass/Fail**: The status of the element whether it is pass, fail, or unknown.
- **Element Pass** **icon**: The pass status of the element.
- **Element Fail** **icon**: The fail status of the element.
- **Pass/Fail not tested**: Gray background indicates that the element is unknown. If there is no icon at the right side corner, it indicates that thresholds are not applied on the element and the element is not tested for Pass/Fail.
- **Diagnostics** **icon**: This icon specifies that some diagnostics is present on the element. See *Diagnostics* on page 141, for more details.
- **Distance Unit**: The units are defined in the Distance unit under General tab in User Preferences.
- **Splitter Ratio**: The splitter ratio is displayed on the element, if the element type is splitter.

Note: *The number of elements displayed in the composition view varies according to the a available space, number of elements, and section size.*

Note: *When the link length is large not all of the elements are visible; you may need to scroll on the link using the navigation arrow.*

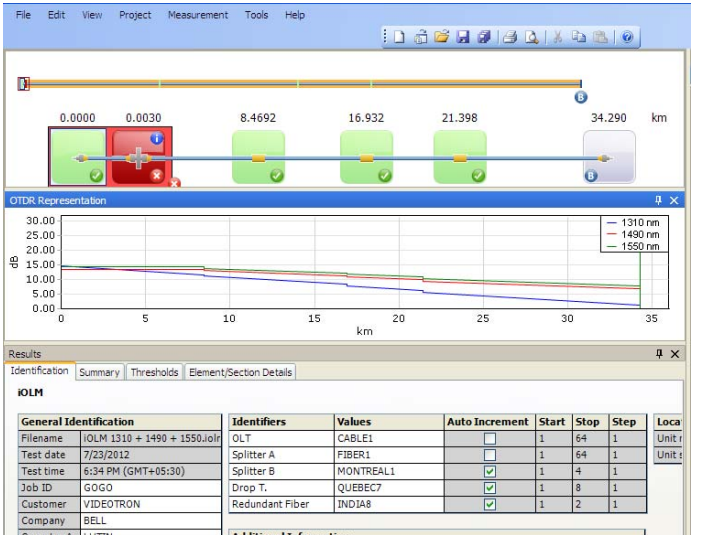
Note: *The distance between the elements are not 100% proportional. To have a proportional representation of the element, see* Link Overview *on page 133.*

OTDR Representation

The OTDR Representation option, displays the OTDR trace representation of the Link View. You can activate OTDR representation display using various ways.

To view the OTDR Representation from View menu:

1. Select an iOLM measurement from measurements window.
2. From the **View** menu, select iOLM, and **View OTDR Representation**.



To view the OTDR Representation from Link View:

1. Select an iOLM measurement from measurements window.
2. Right click on the Link View and select **View OTDR Representation**. For more information see, *OTDR Graphic Display Options* on page 56.

To hide OTDR Representation:

1. From the **View** menu, select iOLM, and click on **View OTDR Representation**.

   OR

   Right click on the Link View, and click on **View OTDR Representation**.

Analyzing Measurements

The Analyze option recalculates the acquisition results. When the trace is analyzed, the manually added elements will be removed from the link and the element details table gets refreshed accordingly.

To analyze measurements:

1. In the **Measurements** tab, select the measurement(s) to analyze.
2. In the **Measurement** menu, select iOLM, and click **Analyze**.

OR

In the **Measurements** tab, select measurement(s) to analyze, right click, and click on **Analyze**.

Managing Configuration Files

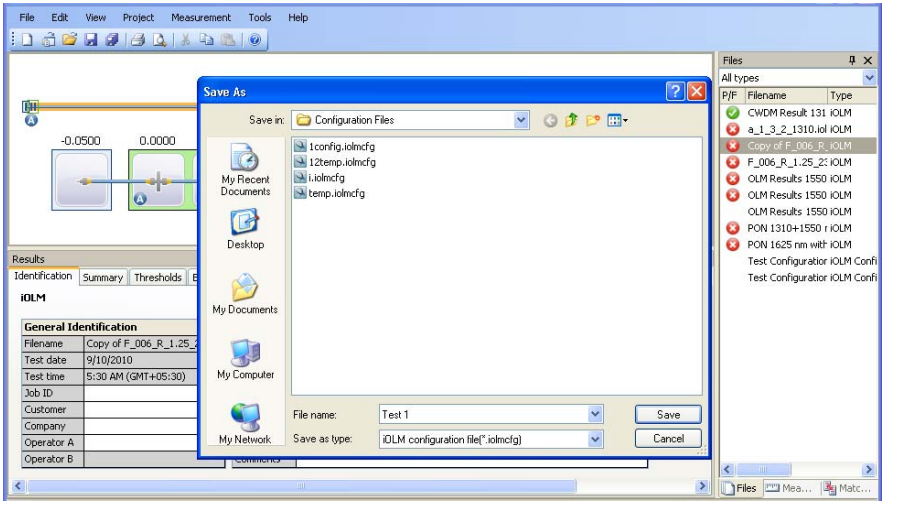
You can create a new configuration file as well as apply configuration settings to existing measurement files.

Creating Configuration File

File menu allows you to create a configuration file and the created file is saved in the configuration file list.

To create a configuration file:

1. From the **File** menu, select **New**, and iOLM **Configuration**.



2. Enter the required file name in the **Save As** dialogue box and press **Save**.

Applying Configuration Settings

When you apply the settings of a configuration file to the selected file from the **Files** window, the identifiers lebels and settings, and Thresholds will get copy to selected files from **Files** window.

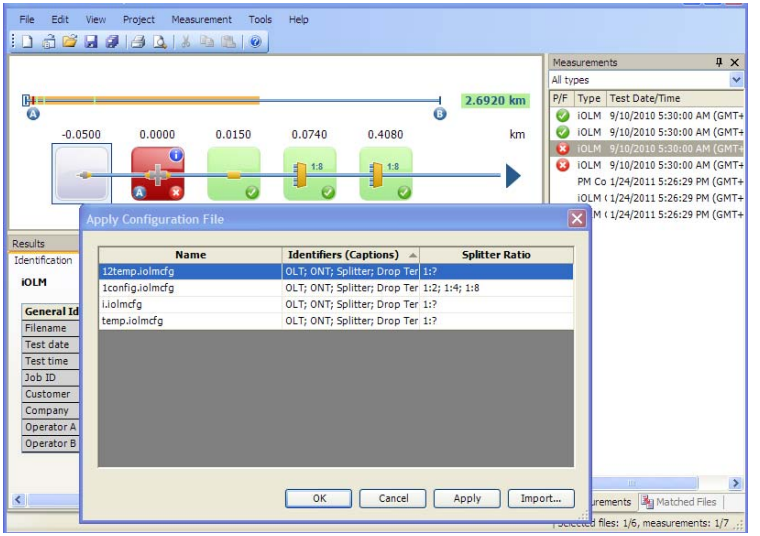
The configuration files are saved in the following locations in your computer system based on the installed operating systems.

- Configuration folder path on Windows XP: **C:\Documents and Settings\All Users\Application Data\Exfo\FastReporter2\Standard\Configuration Files**
- Configuration folder path on Windows Vista and Windows 7: **C:\ProgramData\Exfo\FastReporter2\Standard\Configuration Files**

To apply the configuration settings:

1. Select an iOLM file from the **Files** window, right click, and select **Apply Configuration**.

Note: *You can also apply the configuration settings by from **Tools** > iOLM > **Apply Configuration**.*



2. Select the required configuration file, press **Apply**, and **OK**.

Note: *You can import any other configuration file through the **Import** button to the configuration files list and apply that configuration file's settings to the selected file or files in the **Files** window.*

Diagnostics

This section explains the diagnostics feature available in the intelligent Optical Link Mapper application.

Diagnostics are used to provide additional information about detected problems or ambiguous measurement situations, such as root cause possibilities for the fail status of a link element. The diagnostics provide help to troubleshoot faulty connectors, understand why link elements are tagged as fail or unknown, indicate unexpected instrument or test conditions and so forth.

Link elements with an associated diagnostic are marked with an  icon, and the diagnostics are displayed in the Element tab. More than one diagnostic can be associated with any given element.

The following section describes the Element diagnostics.

Element Diagnostics

Elements diagnostics are associated with specific link elements issues. Each failed link element will have associated diagnostics to assist in troubleshooting. Some elements, such as macrobends, will have associated diagnostics even with a pass status.

Power Meter Results

Power meter results are displayed in the OPM and PPM table. For more details, see Power Meter Results *on page 97*.

11 Viewing and Editing Measurements

The identification information and identifiers are displayed in **Identification** tab. Once you have added files to your list, you can view the results for the measurements they contain in the **Results** window.

The tabs available in the **Results** window depend on the measurement type selected. For example, for OTDR measurements, in addition to the **Identification** and **Summary** tabs, there is also the **Event Table** tab, and the **Markers** tab, if available for the selected measurement. For iOLM, you will have the identification information and identifiers are displayed in **Identification** tab. You can view and modify the label of the identifiers.

For CD measurement, you will have the **Identification**, **Summary**, **Thresholds** and **CD Table** tabs.

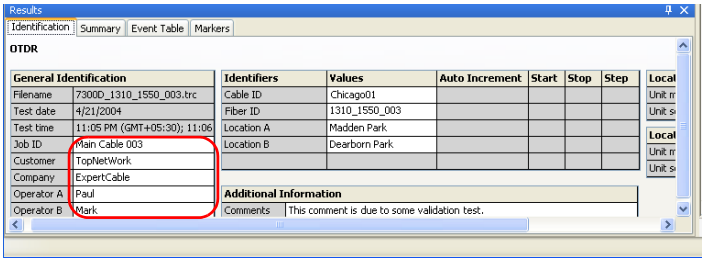
Viewing and Editing Measurement Identification Information

Several of the fields on the **Identification** tab in the **Results** window can be edited. Other fields are populated from information in the measurement file, if present, and will appear shaded.

Your FastReporter application allows you to edit the general identification information for single-fiber as well as multiple-fiber connector FIP files.

To view and edit the identification information:

1. Open the required file.
2. Select the measurement for which you want to view or modify the Identifier labels. You can select more than one using the **Ctrl** or **Shift** keys.
3. In the **Results** window, select the **Identification** tab.
4. Click in the field to the right of the field label.
5. Type the information in the field.



6. You can view and modify the components of the **General Identification table** except the **Filename**, **Test date**, and **Test time**.

7. Select the Identifier from the list of available choices in the **Identifiers** table to modify it. You can also rename the identifier by selecting it. You can modify the values for it in the **Values** column.

Note: *The identifiers label is not editable, if iolm measurements are selected with any other type of measurements like CD or OTDR.*

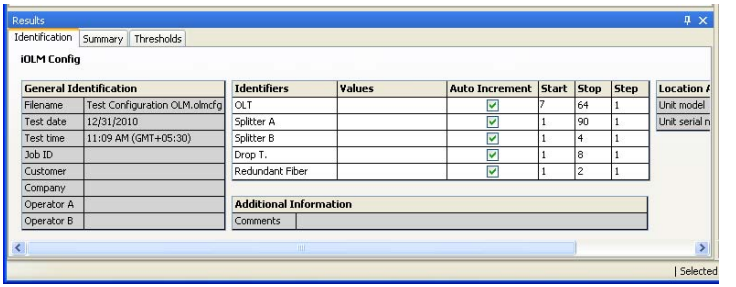
Note: *When the Identifier label is selected as **None**, the values are not editable.*

Modifying Auto-Increment Values

You can modify the Auto-Increment values in the iOLM configuration file only.

To modify the Auto-Increment values:

1. Open an iOLM configuration file.
2. Select the measurement for which you want to modify the auto increment values. You can select more than one using the **Ctrl** or **Shift** keys.
3. In the **Results** window, select the **Identification** tab.



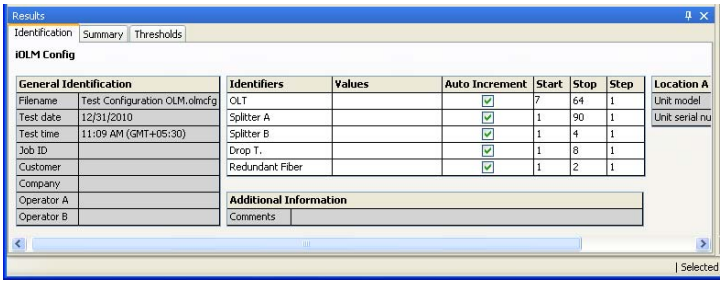
4. Enable the **Auto-Increment** option to modify the **Start**, **Stop**, and **Step** values.

Modifying Start, Stop, and Step Values

You can modify the Start, Stop, and Step values of the iOLM configuration file.

To modify the Start, Stop, and Step values:

1. Open an iOLM configuration file.
2. Select the configuration for which you want to modify the **Start**, **Stop**, and **Step** values. You can select more than one using the **Ctrl** or **Shift** keys.
3. In the **Results** window, select the **Identification** tab.



4. Enable the **Auto-Increment** option to modify the **Start**, **Stop**, and **Step** values.
5. Enter the **Start**, **Stop**, and **Step** values for the identifiers.

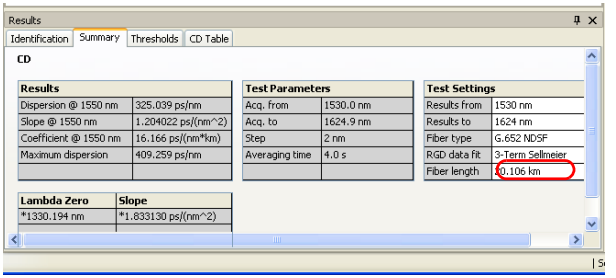
Note: *The Step value must be smaller than the difference between the Start and Stop values. If the Start is greater than the Stop, then the identifier value begins decrementing by the specified Step.*

Viewing and Editing Measurement Summary Information

In the **Summary** tab you can view and edit the Summary information. The fields in the **Test Settings** section on the **Summary** tab are editable.

To view and edit the summary information:

1. Open the required file.
2. Select the measurement for which you want to view or modify the summary information.
3. Click in the field to the right of the field label.
4. Enter a value or select a value from the list.



Viewing and Sorting Files or Measurements

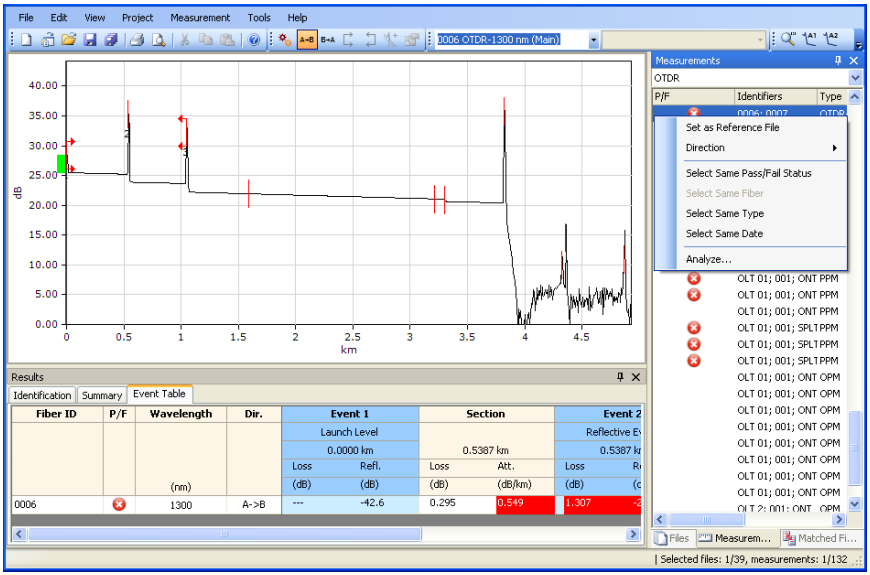
You can view and sort files and measurements according to status, type, operator, test date, date modified, etc.

To sort files and measurements according to a specific header:

Click the corresponding header. A second click will reverse the order.

To select files according to other criteria:

Right-click on a measurement, then select the desired option on the shortcut menu.



Saving Measurement Files

You can save the changes you make to selected measurement files or to all measurement files in the current project.

To save selected measurement files:

1. In the **Files tab**, select the file or files that you want to save.
2. On the **File** menu, click **Save Selected Files**.

To save all files:

On the **File** menu, click **Save All**. All measurement files in the current project and the project file are saved.

12 Generating, Previewing and Printing Reports

FastReporter can print and generate two types of reports:

- *Measurement report:* This type of report contains one measurement type and one measurement at a time.
- *Summary report:* This type of report combines different measurements or several measurements of the same type.

The following options are included in measurement and summary reports, both printed and generated:

Property or Element	Option
General properties	Distance units
OTDR properties	Pulse baseline Events calculation and thresholds Numeric values precision Pass/Fail thresholds Macrobend tolerances
OLTS, OPM, PPM, iOLM, FIP, CD, and PMD properties	Pass/Fail thresholds
Data graph	Zoom

If you want to include other options in a report, you must modify the associated report template using Crystal Reports. For more details, see *Creating and Modifying Report Templates* on page 161.

For examples of the reports you can generate with FastReporter, see *Report Samples* on page 227.

Generating Reports

You can easily generate a variety of reports in either electronic format or print them out for later consultation (see *Printing Reports* on page 158 for details on printing).

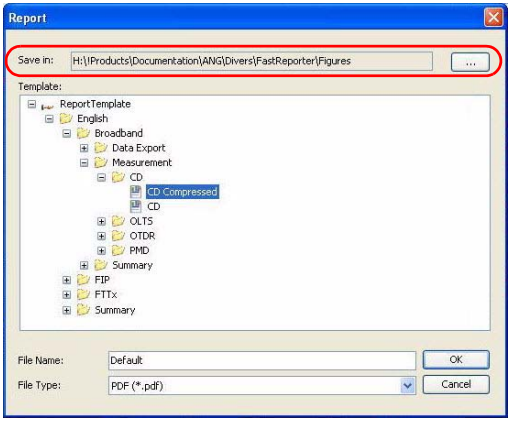
FastReporter can generate reports for the following applications:

File Type	Application
*.xls	These reports can be viewed with Microsoft Excel.
*.pdf	These reports can be viewed with the Adobe Reader.
*.html	These reports can be viewed in any Web browser.

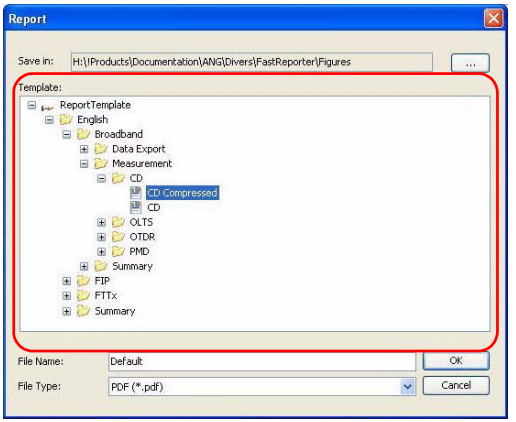
Note: *You can find samples of the various available report types in* Report Samples *on page 227.*

To generate a measurement or summary report:

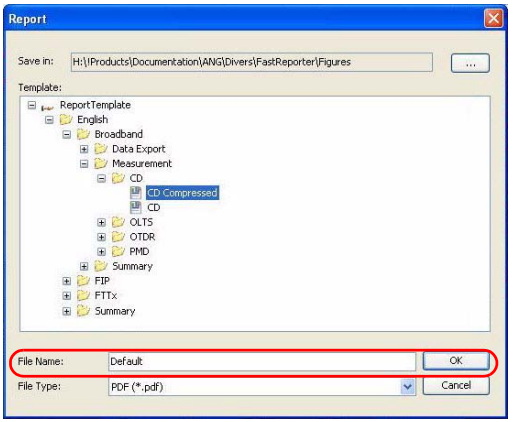
1. Select measurements or files in the **Measurements** or **Files** tabs.
2. On the **Tools** menu, click **Report**.
3. If needed, select the location where to save the report.



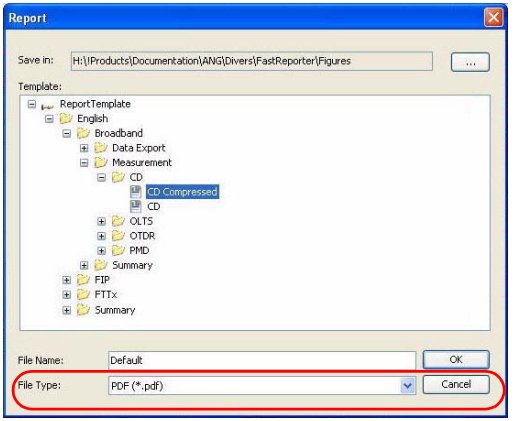
4. In the **Template** list, select a report template.



5. In the **File Name** box, type a name for the report.



6. In the **File Type** list, select whether you want to save the report as a PDF or html file.



7. Click **OK**.

Previewing Reports

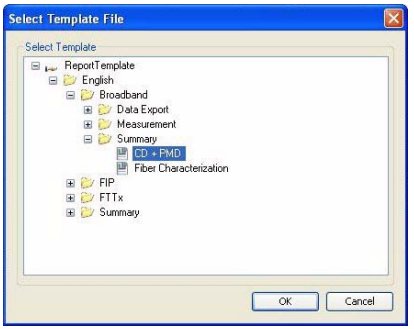
The print preview function provides you with the option of previewing your reports before you print them.

To preview a report:

1. Select measurements or files in the **Measurements** or **Files** tab.
2. On the **File** menu, click **Print Preview**.

   The type of report displayed is the last type of report you have selected.
3. In the print preview window, click  , and select a zoom option from the list, if desired.

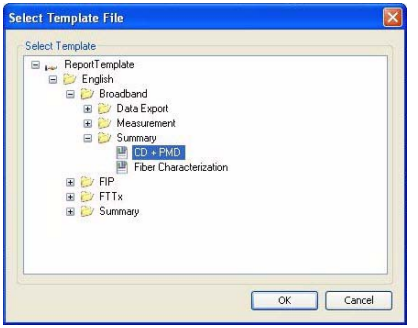
   To select a different measurement report template, click  , and select a template in the **Select Template File** window.



4. To close the **Print Preview** window, click **Close**.

To preview a summary report:

1. Select measurements or files in the **Measurements** or **Files** tab.
2. On the **File** menu, click **Print Preview**.
3. In the **Select Template File** dialog box, select a summary report template.

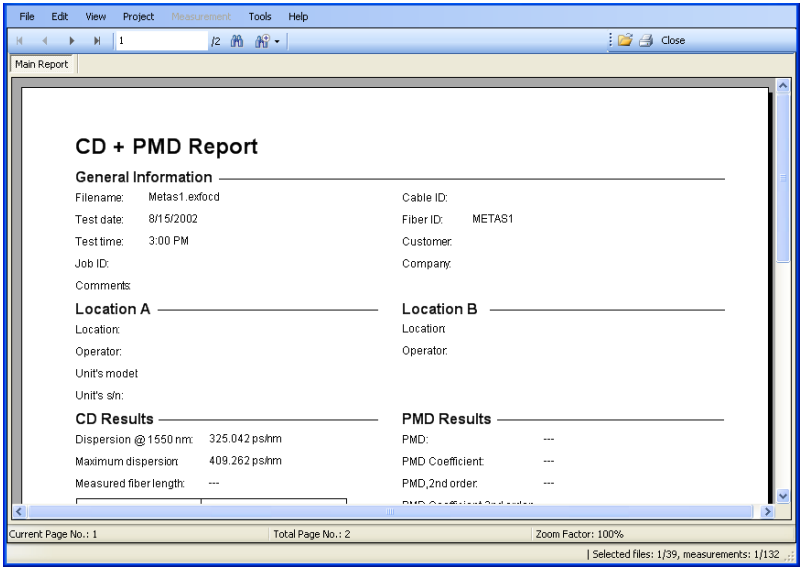


4. Click **OK**.

   In the print preview window, click , and select a zoom option from the list, if desired.

   To select a different summary report template, click , and select a template in the **Select Template File** dialog box.

5. To close the **Print Preview** window, click **Close**.

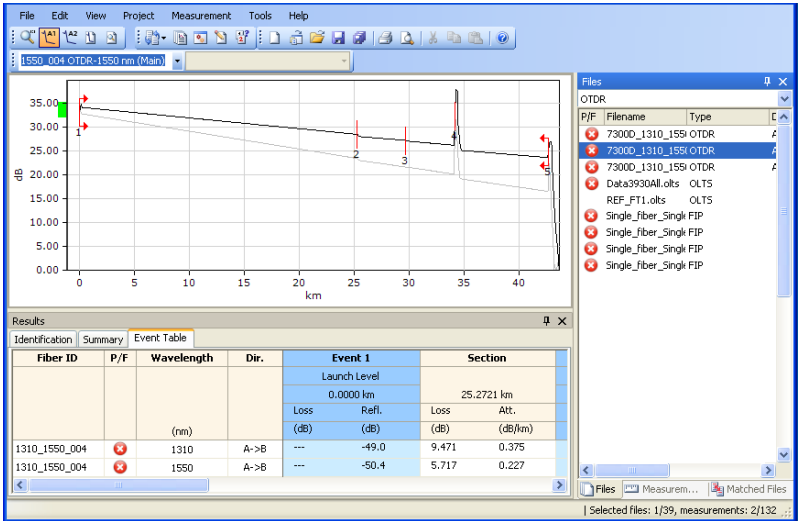


Printing Reports

FastReporter allows you to print your reports for future consultation.

To print a measurement report:

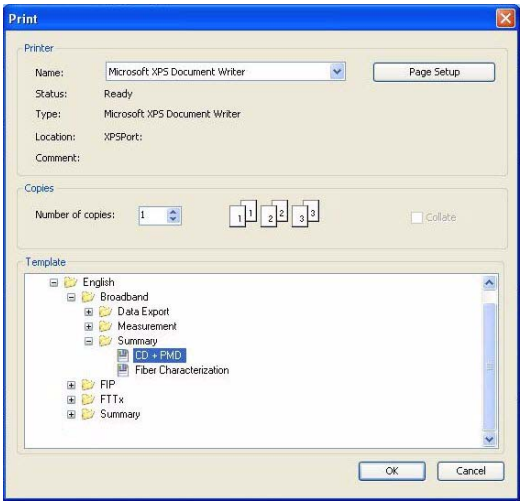
1. Select measurements or files in the **Measurements** or **Files** tab.



2. On the **File** menu, select **Print**.

3. If needed, change the printer or printer settings.

4. Select a measurement report template.



5. Click **OK**.

Using the Clipboard

You can copy and paste measurement graphics from FastReporter into other applications. For example, you can paste a graphic into an e-mail message, or into applications such as Microsoft Excel for use in existing measurement reports.

To use the clipboard:

1. Click on the graphic in FastReporter.
2. On the **Edit** menu, click **Copy**.

   OR

   Click the right mouse button and, on the shortcut menu, click **Copy**.
3. Switch to the application you want to paste the graphic into (e-mail client, spreadsheet, word processing application, etc.).
4. Place the mouse pointer where you want to insert the graphic and, on the application's **Edit** menu, click **Paste**.

Creating and Modifying Report Templates

To create a new report template, or to modify an existing FastReporter report template, you must use the Crystal Reports application. For details on using Crystal Reports, refer to your Crystal Reports product documentation.

To create a new report template, EXFO recommends that you start with an existing FastReporter report template and modify it as required. This way you will have access to the database fields for populating the report with measurement data. Once you are done, save it using a different name that suits your testing needs.

By default, FastReporter report templates are located in:

C:\Documents and Settings\All Users\Application Data\EXFO\FastReporter2\Standard\Report Template, if your computer is running on Windows XP.,

OR

C:\ProgramData\EXFO\ FastReporter2\Standard\Report Template, if your computer is running on Windows Vista or Windows 7.

You can access the available report templates in the **Select Template File** dialog box (displayed when you click **Print Preview** on the **File** menu), the **Print** dialog box (displayed when you click **Print** on the **File** menu), and on the **Report** dialog box (displayed when you click **Report** on the **Tools** menu).

To modify a report template:

1. Start Crystal Reports.
2. On the **File** menu, click **Open**.
3. On the **Open** dialog box, select and open the folder containing the report template you wish to modify.
4. Select a report template and click **Open**.
5. On the **File** menu, click **Save As**.
6. Type a new name for the report. This will preserve the original FastReporter report templates.
7. Modify the template by modifying or adding labels, header and footer information, company logo, etc.
8. Add fields to the report as needed by selecting them from the **Field Explorer** window.
9. Once you have finished modifying the report, click **Save** on the **File** menu.

To add a report template to the list of available templates:

Save the template directly in the appropriate folder within the Report Template folder after you have modified it in Crystal Reports.

OR

Move the template into the appropriate folder within the Report Template folder so that it will be available on the **Select Template File** dialog box.

You can also create your own folders and subfolders within the Report Template folder to organize your report templates.

To remove a report template from the list of available templates:

In Windows Explorer, remove the files from the folder within C:\Documents and Settings\All Users\Application Data\EXFO\FastReporter2Standard\Report Template, if your computer is running on Windows XP.,

OR

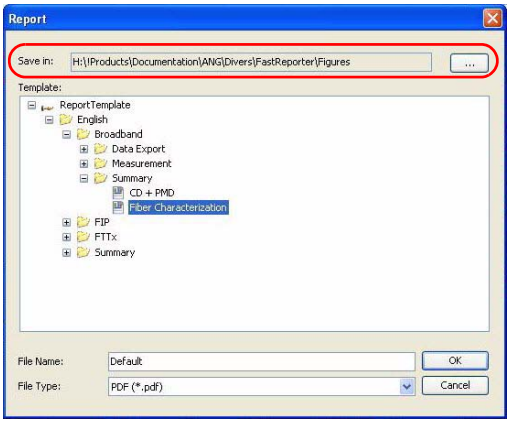
C:\ProgramData\EXFO\FastReporter2Standard\Report Template, if your computer is running on Windows Vista or Windows 7, and store it elsewhere if you want to keep it, or delete the file to remove it completely.

13 Exporting Data for Postprocessing

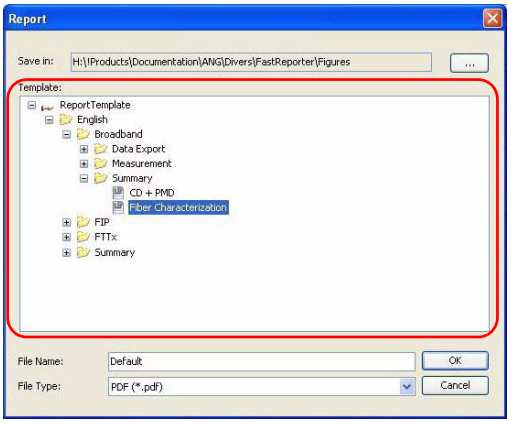
FastReporter can issue data files in a simplified, raw format for further data processing purposes. The data is put in a Microsoft Excel (.xls) format.

To export data:

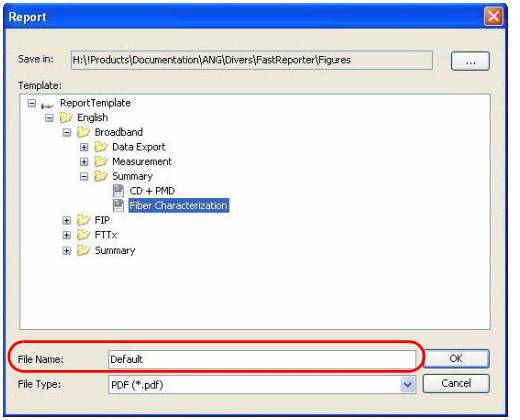
1. Select measurements or files in the **Measurements** or **Files** tab.
2. On the **Tools** menu, click **Report**.
3. If needed, select the location where to save the data.



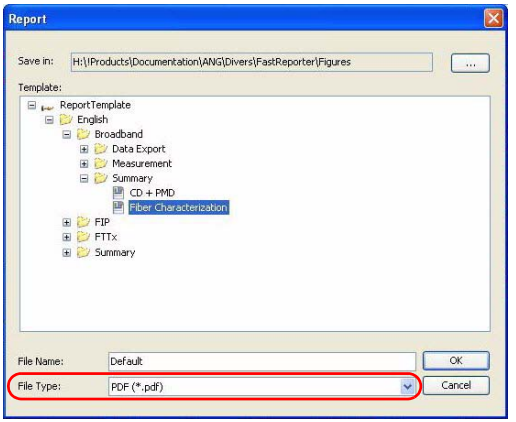
4. In the **Template** list, select a data export template.



5. In the **File Name** box, type a name for the data file.



6. In the **File Type** list, select .xls.



7. Click **OK**.

14 Using FastReporter Tools

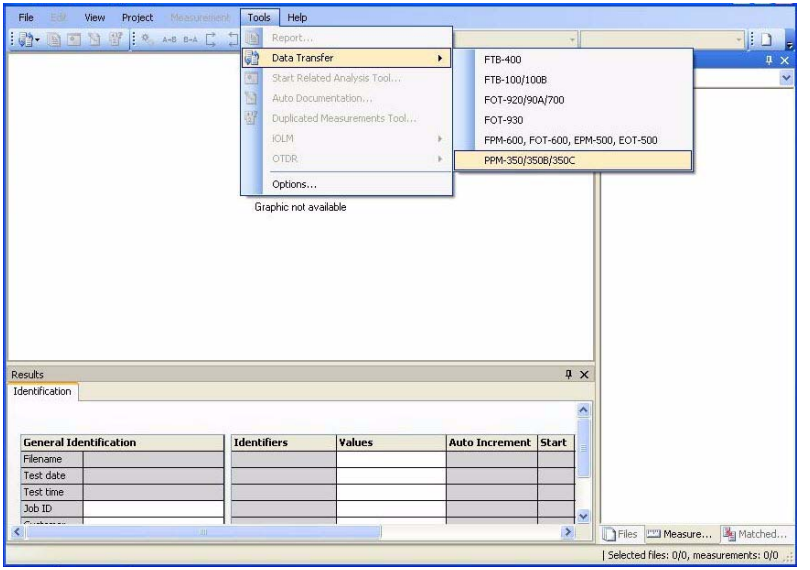
FastReporter features tools to help you better manage your data, such as:

- Data transfer tools
- Related analysis tools

To start a data transfer application:

On the **Tools** menu, select **Data Transfer**, and select the application associated with the handheld unit to or from which you want to send or receive data.

Note: *Data transferred from a handheld unit is not automatically added to your FastReporter project. The files will be stored on your computer and you need to add them to your project using one of the methods described in* Adding and Removing Measurement Files *on page 23.*



The corresponding application opens. Refer to the user guide corresponding to the selected data transfer application for details.

To start an analysis tool:

1. Select the measurement in the **Measurements tab**.
2. On the **Tools** menu, click **Start Related Analysis Tool**.

Note: *If you modify the measurement file in the related analysis tool, FastReporter will ask you if you want to reload the file.*

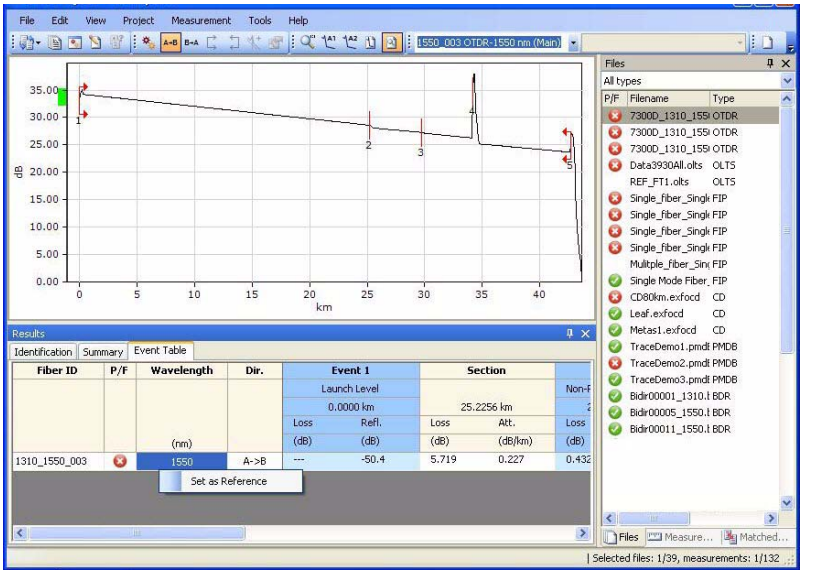
The corresponding application opens. Refer to the user guide corresponding to the data analysis application you have selected for more details.

Setting a Reference File or Measurement

A reference file is used to compare fibers within the same cable, monitor fiber deterioration or compare fibers before and after installation. Once a measurement file has been added to a project, you can set it as a reference file. The reference file can then be used to automatically document other measurement files (refer to *Automatically Documenting Measurement Files* on page 173). For supported OTDR file formats, FastReporter will display the reference measurement, in red, in the Event Table. The reference measurement can then be applied as a template (refer to *Applying an OTDR Reference as a Template* on page 60). You can set a file as a reference if the file format supports applying a reference as a template.

To set a reference measurement:

1. In the **Files** window, select the file.
2. In the Event Table, right-click on the measurement in the **Fiber ID**, **P/F**, **Wavelength** or **Dir.** column, and select **Set as Reference** on the shortcut menu.



To set a reference file:

1. Select the file in the **Files** window.
2. On the **Files** menu, click **Set as Reference File**.

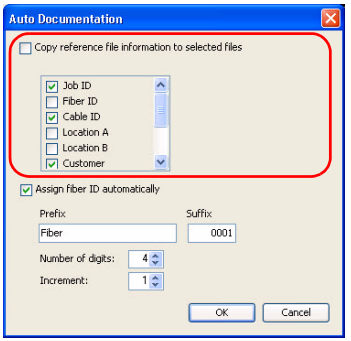
   OR

   Click the right mouse button and click **Set as Reference File** on the shortcut menu.

Automatically Documenting Measurement Files

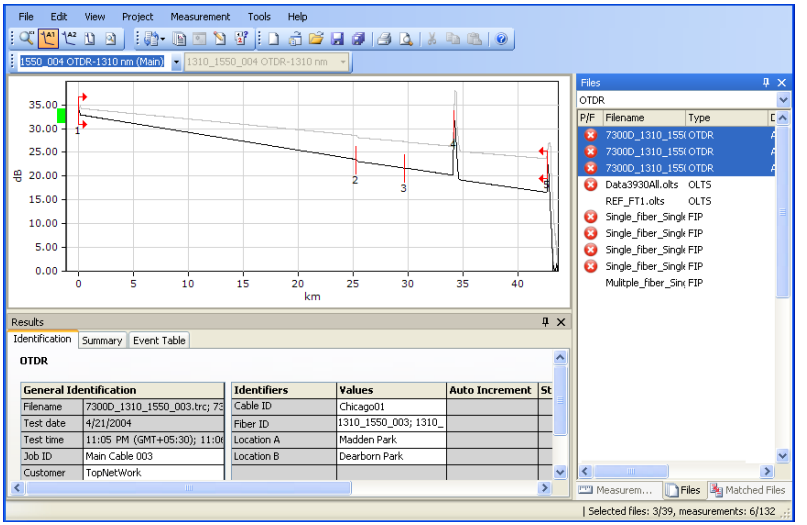
The auto documentation feature can be used to copy selected Identification information from a reference file to the selected files. You can also use this feature to automatically assign fiber IDs to the selected files.

For the auto documentation tool is available even if no reference file is defined. If no reference file is selected, the **Copy the reference file information to selected files** option is not available in the auto documentation window, while the **Assign fiber ID automatically** option will be available if selected files contains at least one identifiers as fiber id.



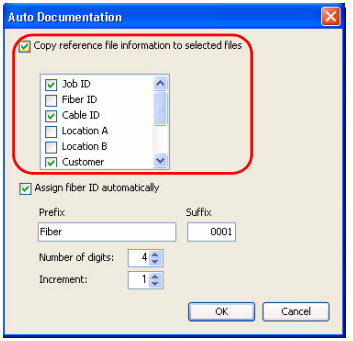
To use the auto documentation feature:

1. In the **Files** window, select the file that will serve as the reference file.
2. From the **File** menu, click **Set as Reference File**.
3. In the **Files** window, select the files to which to copy the reference file's Identification information and/or to which to automatically assign fiber IDs.

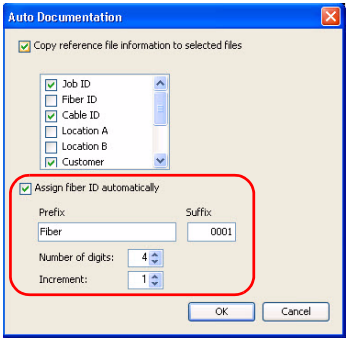


4. From the **Tools** menu, click **Auto Documentation**.
5. For any measurement, on the **Auto Documentation** dialog box, Select **Copy reference file information to selected files** if you want FastReporter to copy the reference file information to the selected files. When the **Copy reference file information to selected files** option is selected, the corresponding list under the check box is enabled. You can then select which information to copy from the reference.

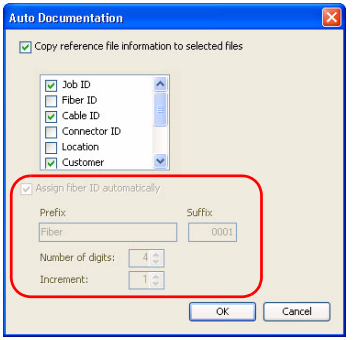
Note: *The file information options listed are the identifiers included in the reference file.*



6. Select **Assign fiber ID automatically**, enter a prefix and suffix, and select the number of digits and increment value if you want FastReporter to automatically assign fiber IDs to the selected files.



for measurements with Fiber Id information



for measurements without Fiber Id information

Note: *The information will be copied to the selected files only if the selected file contains the field selected by user. For example, if cable id is present in the selected file then only cable id information will be copied to selected files.*

7. Click **OK**.

Using the Duplicated Measurements Tool

Sometimes, you might need to verify if tests were actually performed on fibers and that the analysis or results were not just copied and pasted there for speedy execution purposes. The duplicated measurements tool can help you to quickly locate such files.

When you select at least two measurement files, you can have FastReporter automatically compare them and indicate which files show the same acquisition time, measurement wavelength and module serial number. These files can then be selected automatically so you do not have to look for them through your list, and batch processed.

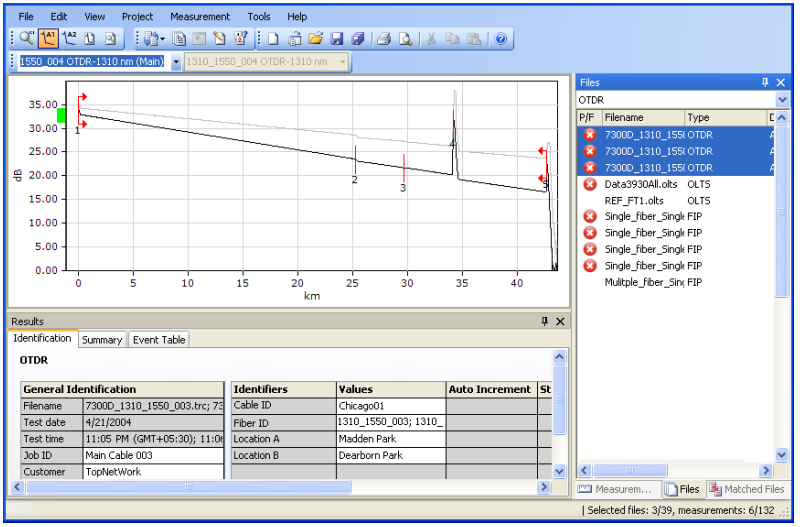
Note: *For FIP, the application will match the Fiber ID, Test Configuration name and Test Date/Time of the measurement to mark the measurements as duplicated.*

Note: *In the case of bidirectional OTDR files, both directions are analyzed separately.*

To search for duplicated information in files:

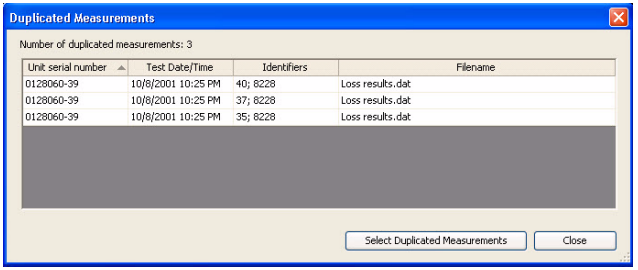
1. Open the files on which you want to use the tool.

2. Select the desired measurements with the Ctrl or Shift keys.



3. Select the **Tools** menu, then **Duplicate Measurements Tool**.

   The files are analyzed and the result appears on-screen. The Duplicate Measurement tool will display Unit serial number, Test Date/Time, Identifiers, and Filename details.



4. By clicking **Select Duplicate Measurements**, you will automatically pick the detected files in the **Measurements** tab.

5. Proceed with any batch operation you want to perform for those files.

15 FastReporter Examples

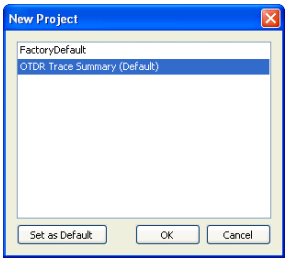
This chapter walks you through the tasks required to create and modify projects, reports, and templates. Detailed procedures are provided for creating the following five examples:

- *Creating a project:* Create a project in a few easy steps.
- *OTDR Bidirectional project:* Create an OTDR project with OTDR traces going in both directions (that is, from A to B and from B to A).
- *Fiber Characterization:* Create a printed or electronic fiber characterization report based on selected measurements.
- *Project Template:* Create a project template containing the properties and settings that you often use in your projects.

Creating a Project

To create a project:

1. On the **File** menu, point to **New**, and click **Project**.
2. In the list, click the template you want to use.



3. Click **OK**.
4. On the **Project** menu, click **Add File**.

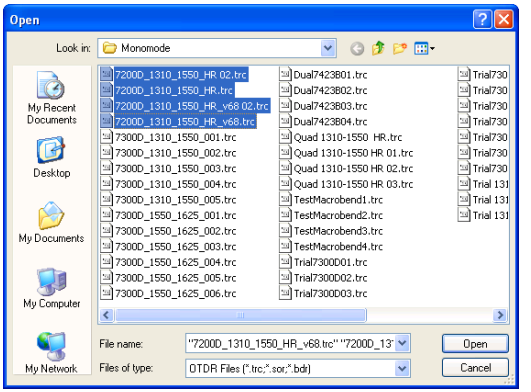
5. Select multiple files. Multiple files can be selected by one of two ways:

   ➤ Click a file to select it, press the Shift key, and select another file.

   All files in the file list between the two files are highlighted.

   ➤ Click a file to select it, press the Ctrl key, and select another file (and another file if needed).

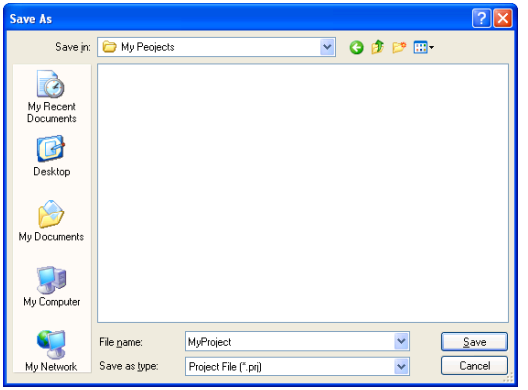
   The selected files are highlighted.



6. Click **Open** to add the selected files to the project.
7. On the **File** menu, click **Save Project**.
8. Click the folder where you want to save the project file.

9. In the **File name** box, type a name for the project file.

FastReporter automatically adds the .prj extension to the file name when you save the file.



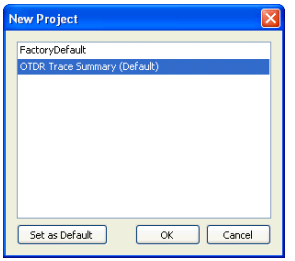
10. Click **Save**.

Creating an OTDR Bidirectional Project

You can use two different methods to change the directions of the files in bidirectional projects.

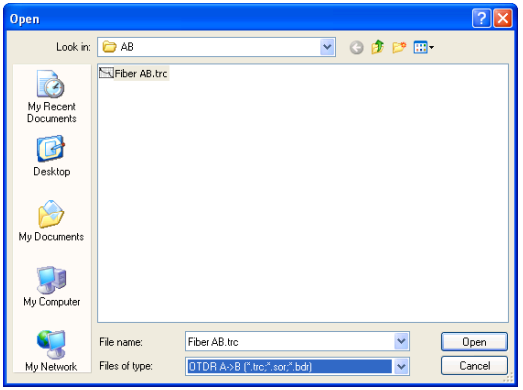
To create an OTDR Bidirectional project, first method:

1. On the **File** menu, point to **New**, and click **Project**.
2. In the list, click the template you want to use.

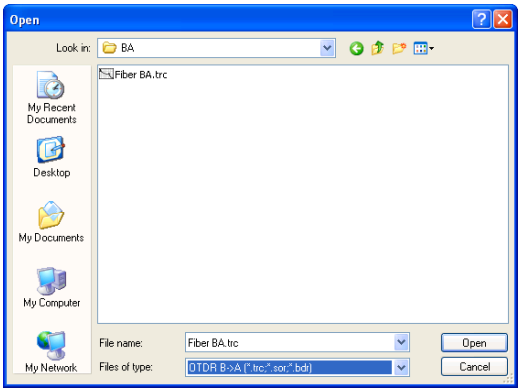


3. Click **OK**.
4. On the **Project** menu, click **Add File**.
5. Select an OTDR file.

6. In the **Files of type** list, click **OTDR A->B** to set the direction of the selected OTDR file from A to B.

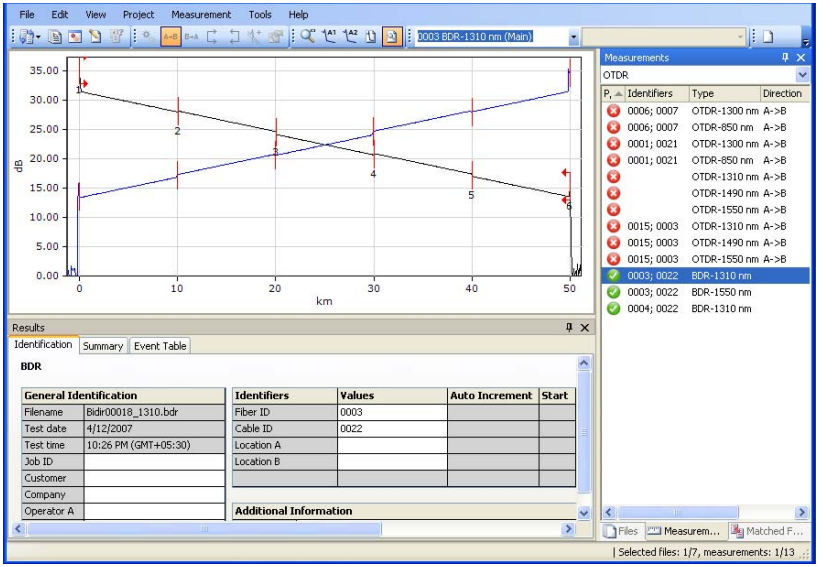


7. Click **Open** to add the file to the project.
8. On the **Project** menu, click **Add File**.
9. Select an OTDR file.
10. In the **Files of type** list, click **OTDR B->A** to set the direction of the selected OTDR file from B to A.



11. Click **Open** to add the file to the project.

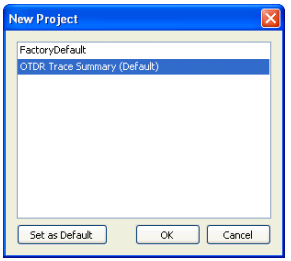
12. Select the files in the **Files** window.



The data graph displays the traces as being bidirectional.

To create an OTDR Bidirectional project, second method:

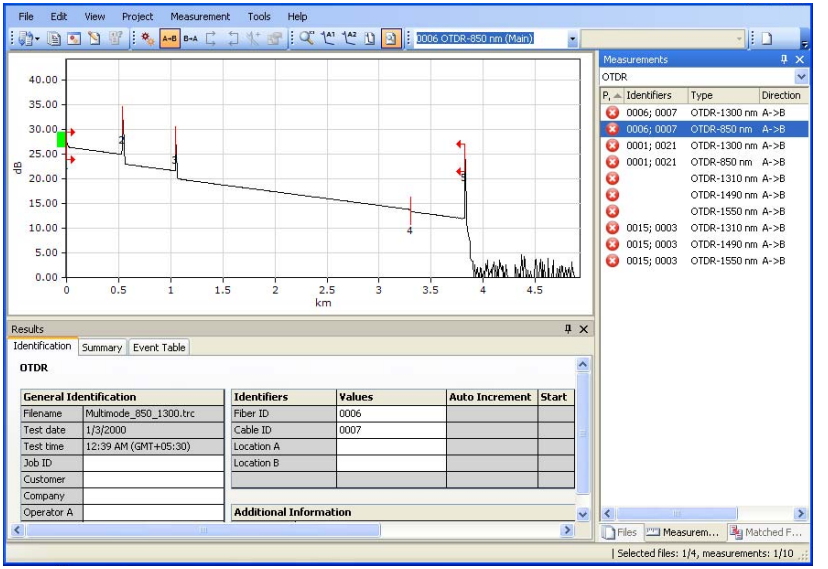
1. On the **File** menu, point to **New**, and click **Project**.
2. In the list, click the template you want to use.



3. Click **OK**.
4. On the **Project** menu, click **Add File**.
5. Select the OTDR files to be added to the project. Multiple files can be selected by one of two ways:
   - ➤ Click a file to select it, press the Shift key, and select another file.
   - ➤ Click a file to select it, press the Ctrl key, and select another file (and another file if needed).

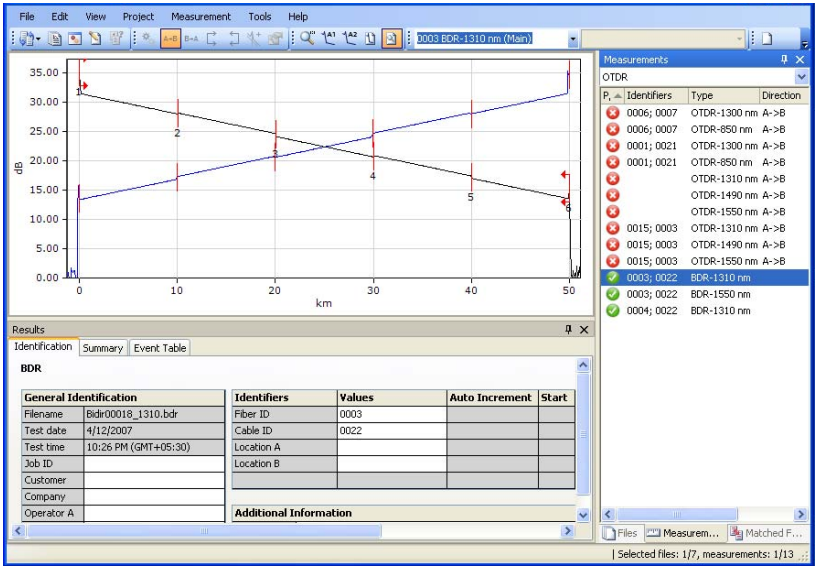
   The selected files are highlighted.
6. Click **Open**.

7. In the **Files** window, select the file in which to change the direction.



8. On the **File** menu, point to **Direction**, and click **B->A**.

9. Select the files in the **Files** window.



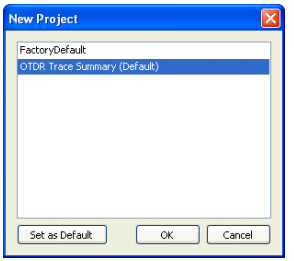
The data graph displays the traces as being bidirectional.

Creating a Fiber Characterization Report

Throughout the network life cycle, fiber characterization reports are essential for avoiding delays in service provisioning before system component installation, in results comparison for post-installation troubleshooting, and in ongoing network analysis and trending.

To create a fiber characterization report:

1. On the **File** menu, point to **New**, and click **Project**.
2. In the list, click the template you want to use.



3. Click **OK**.
4. On the **Project** menu, click **Add File**.
5. Select multiple CD, OLTS, PMD, or OTDR files. Multiple files can be selected by one of two ways:

   ➤ Click a file to select it, press the Shift key, and select another file.

   All files in the file list between the two files are highlighted.

   ➤ Click a file to select it, press the Ctrl key, and select another file (and another file if needed).

   The selected files are highlighted.

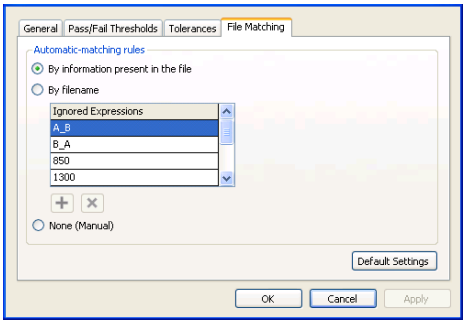
Note: *You must select files with matching fiber IDs.*

6. Click **Open** to add the selected files to the project.

7. On the **Project** menu, point to **Properties**, and click **OTDR**.

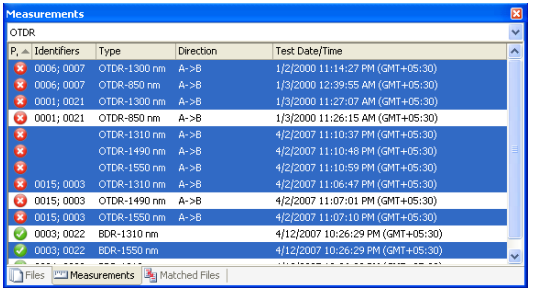
8. On the **OTDR Project Properties** dialog box, click the **File Matching** tab.

9. Click **By information present in the file**.



10. Click **OK**.

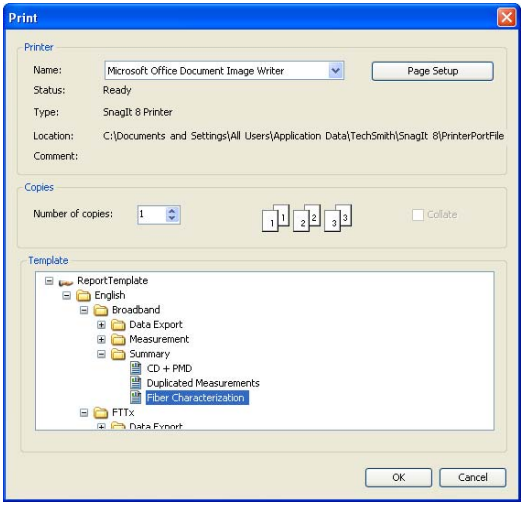
11. In the **Measurements** window, select the measurements you want to include in the report.



12. To print or create an electronic version of the report, follow the appropriate procedure on the next page.

To print the report:

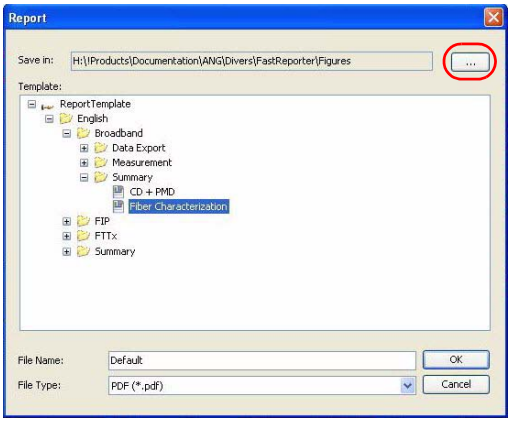
1. On the **File** menu, click **Print**.
2. If needed, change the printer settings.
3. In the **Template** list, select **Fiber Characterization**.



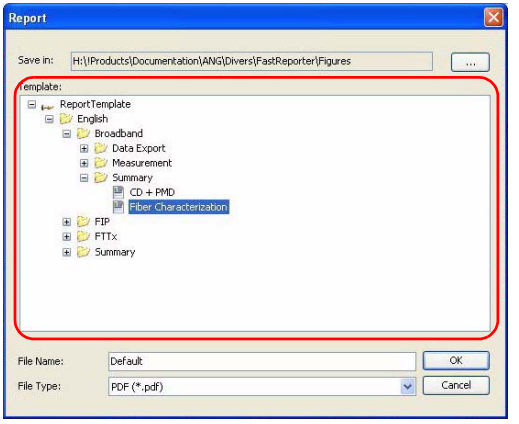
4. Click **OK**.

To create an electronic version of the report:

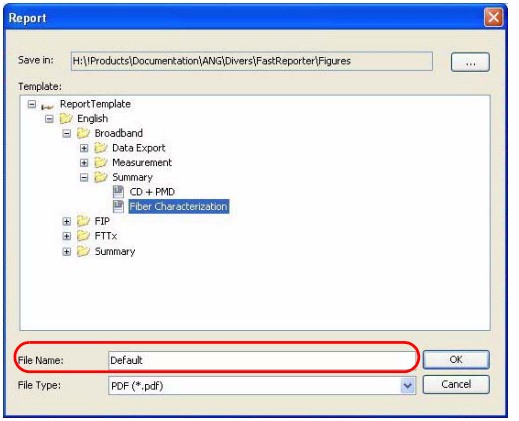
1. On the **Tools** menu, click **Report**.
2. To change the destination folder, click [...], select a folder on the **Browse for Folder** dialog box, and click **OK**.



3. In the **Template** list, click **Fiber Characterization**.

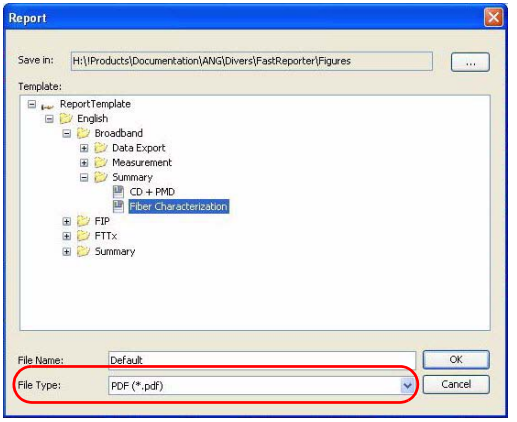


4. In the **File Name** box, type a name for the report.



5. In the **File Type** list, select a file type. FastReporter can generate reports for the following applications:

File Type	Application
*.xls	These reports can be viewed with Microsoft Excel.
*.pdf	These reports can be viewed with the Adobe Reader.
*.html	These reports can be viewed in any Web browser.



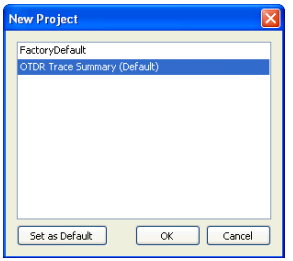
6. Click **OK**.

Creating a Project Template

You can save the properties and settings you often use when creating projects in a project template. For example, you can save the pass/fail thresholds that you often use in your OTDR projects in an OTDR project template.

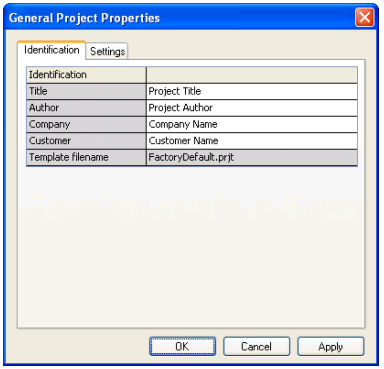
To create a project template:

1. On the **File** menu, point to **New**, and click **Project**.
2. In the list, click a template. Use an existing template that already contains some of the properties and settings that you want to use as a starting point, if applicable.



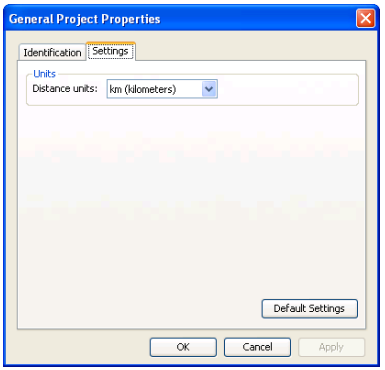
3. Click **OK**.
4. On the **Project** menu, click **General Properties**.

5. On the **General Project Properties** dialog box, click the **Identification** tab.



6. Click **Title** and type a title for your template. Type your name as the **Author**, and the name of the **Company** and **Customer**.

7. Click the **Settings** tab.

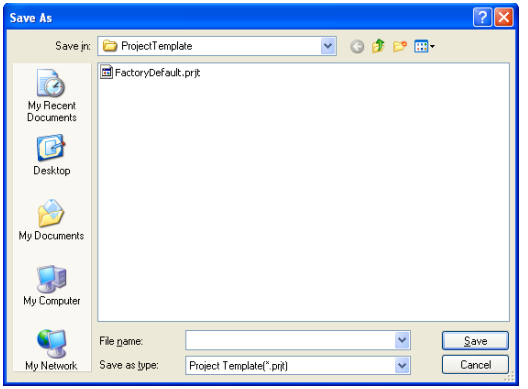


8. If needed, select the distance units you want to use in your project.

9. When you have finished making changes to the project properties, click **OK**.

10. On the **File** menu, click **Save Project As Template**.

11. In the **File name** box, type a name for the project template file.

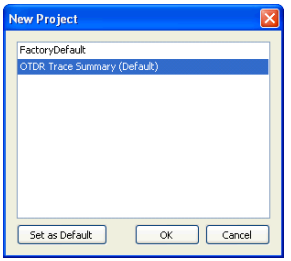


Note: *FastReporter automatically saves project templates in the Project Template folder. If you change the location, the template will not be available for selection in the New Project dialog box when you start a new project.*

12. Click **Save**.

13. On the **File** menu, point to **New**, and click **Project**.

14. To set the new project template as the default template, click the file name, and click **Set as Default**.



15. Click **OK** to start a new project or **Cancel** if you do not wish to start a new project at this time.

16 Troubleshooting

Help and support options for FastReporter are available on the **Help** menu.

Online Help

Help on using the features in FastReporter is available in the online help.

To display online help:

On the **Help** menu, click **Help on FastReporter**.

OR

Press the F1 key.

Technical Support

Product support including technical assistance, information, and training is available on EXFO's Web site. If you have Internet access on the computer where FastReporter is installed, you can access the Support pages by selecting **Technical Support** on the **Help** menu.

If you do not have Internet access, you can get technical support contact information by selecting **About FastReporter** on the **Help** menu.

Contacting EXFO

You can view information about your copy of FastReporter and contact information should you require product support.

On the **Help** menu, click **About FastReporter**.

Be sure to note the version number for your copy of FastReporter before contacting EXFO Support.

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Vers. 031113

A Description of OTDR Event Types

This section describes all types of events that may appear on the graphic generated by the application. Here is a guide to the descriptions:

- Each type of event has its own symbol.
- Each type of event is represented by a graph of a fiber trace, which illustrates the power reflected back toward the source as a function of distance.
- An arrow points to the location of the event type in the trace.
- Most graphs show one complete trace; that is, an entire range.
- Some graphs show only a portion of the entire range to view events of interest more closely.

Span Start 

The Span Start of a trace is the event that marks the beginning of the fiber span. By default, the Span Start is placed on the first event of a tested fiber (typically the first connector of the OTDR itself).

You can make another event the start of the span you want to focus your analysis on. This will set the beginning of the events table at a specific event along the trace.

Span End 

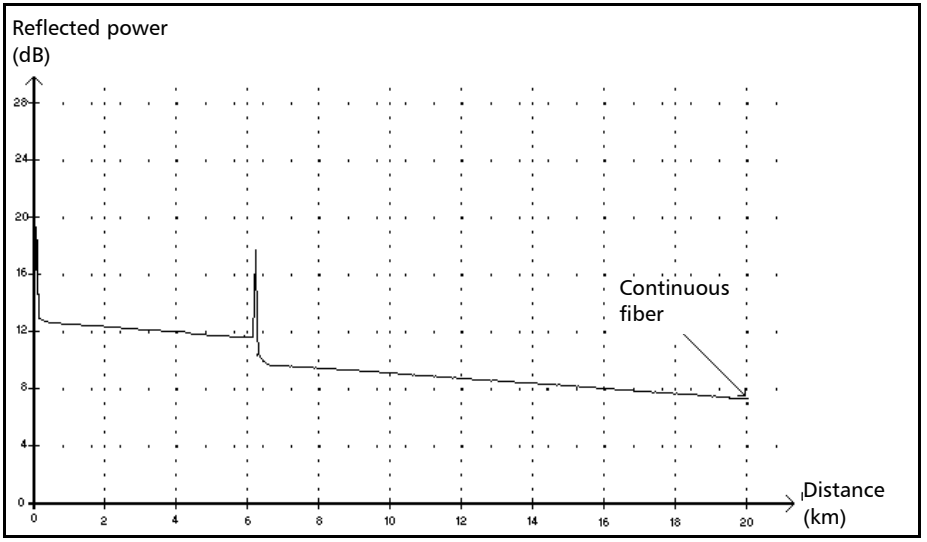
The Span End of a trace is the event that marks the end of the fiber span. By default, the Span End is placed on the last event of a tested fiber, and is called the end-of-fiber event.

You can also make another event the end of the span you want to focus your analysis on. This will set the end of the events table at a specific event along the trace.

Short Fibers 

You can test short fibers with the application. You can even define a fiber span for short fibers by placing the span start and the span end on the same event.

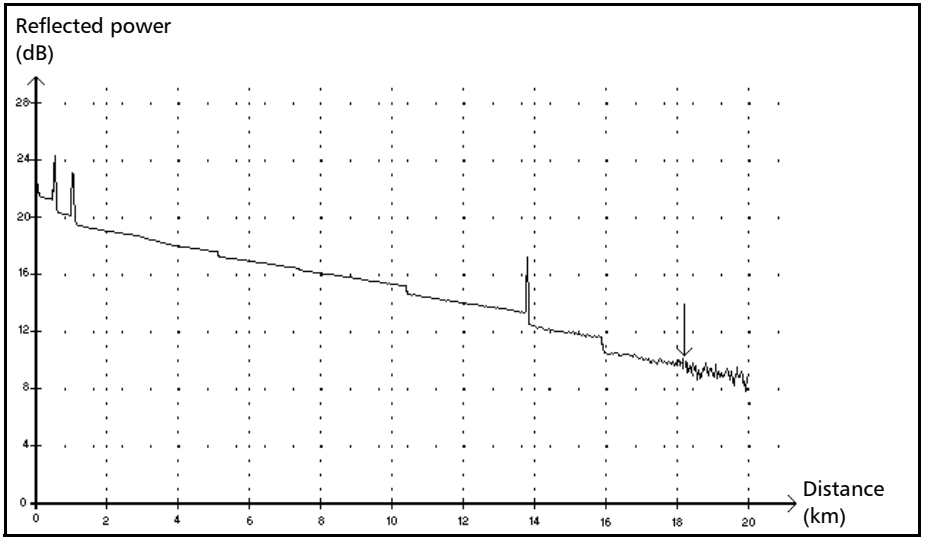
Continuous Fiber



This event indicates that the selected acquisition range was shorter than the fiber length.

- The fiber end was not detected because the analysis process ended before reaching the end of the fiber.
- The acquisition distance range should therefore be increased to a value greater than the fiber length.
- There is no loss or reflectance specified for continuous fiber events.

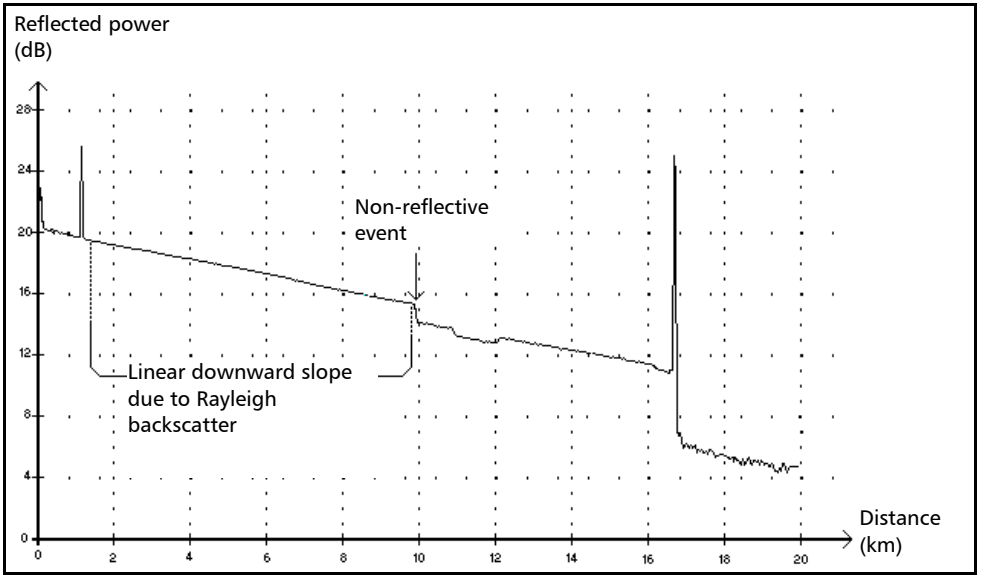
End of Analysis



This event indicates that the pulse width used did not provide enough dynamic range to get to the end of the fiber.

- The analysis ended before reaching the end of the fiber because the signal-to-noise ratio was too low.
- The pulse width should therefore be increased so the signal reaches the end of the fiber with a sufficient signal-to-noise ratio.
- There is no loss or reflectance specified for end-of-analysis events.

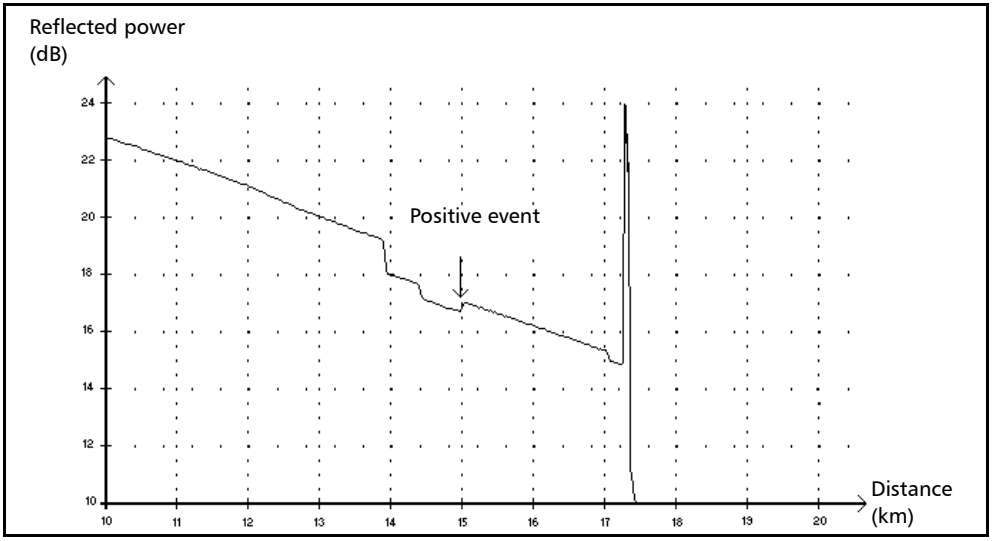
Non-Reflective Event



This event is characterized by a sudden decrease in the Rayleigh backscatter signal level. It appears as a discontinuity in the downward slope of the trace signal.

- This event is often caused by splices, macrobends, or microbends in the fiber.
- A loss value is specified for non-reflective events. There is no reflectance specified for this type of event.
- If you set thresholds, the application indicates a non-reflective fault in the events table, whenever a value exceeds the loss threshold.

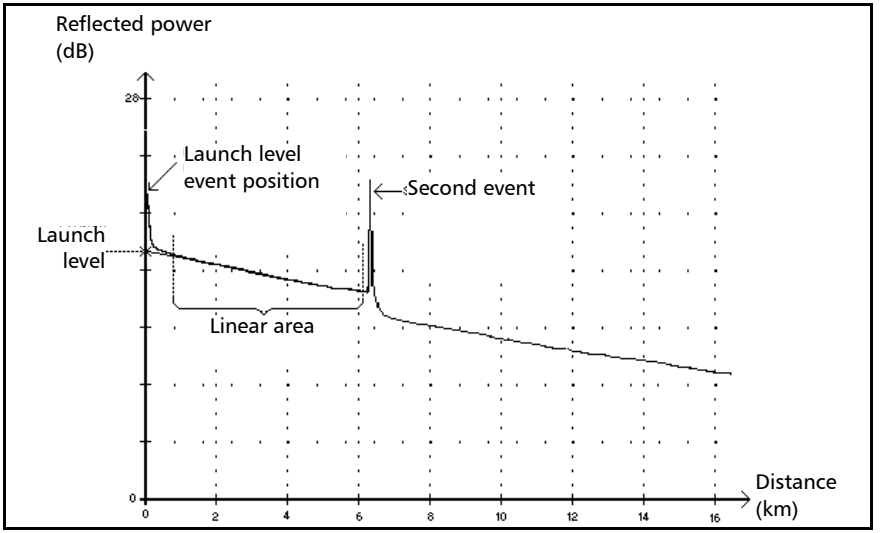
Positive Event



This event indicates a splice with an apparent gain, due to the junction of two fiber sections having different fiber backscatter characteristics (backscatter and backscatter capture coefficients).

- A loss value is specified for positive events. The loss specified does not indicate the true loss of the event.
- The true loss has to be measured by performing bidirectional fiber measurements and bidirectional analysis.

Launch Level →



This event indicates the level of the signal launched into the fiber.

➤ The figure above shows how the launch level is measured.

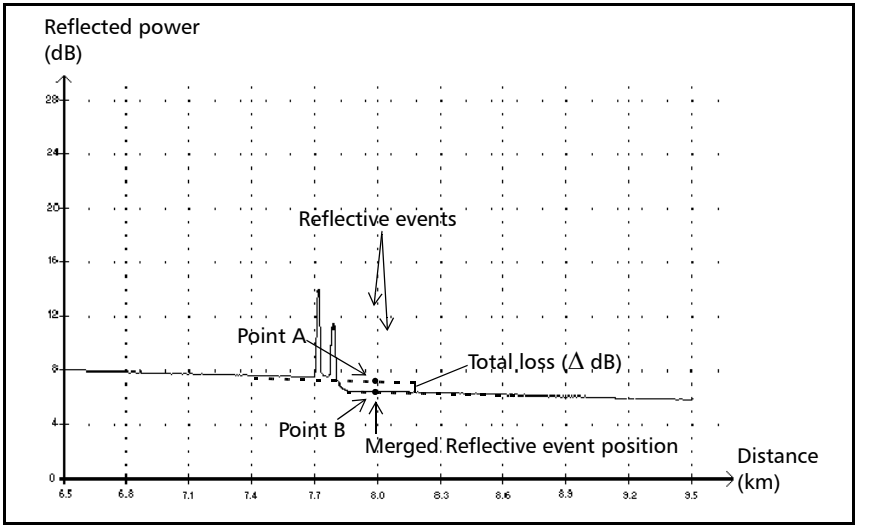
A straight line is plotted using least-square approximation to fit all trace points in the linear area between the first and second detected events.

The straight line is projected toward the Y (dB) axis until it crosses the axis.

The crossing point indicates the launch level.

➤ <<<< in the events table indicates that the launch level is too low.

Merged Reflective Event Σ



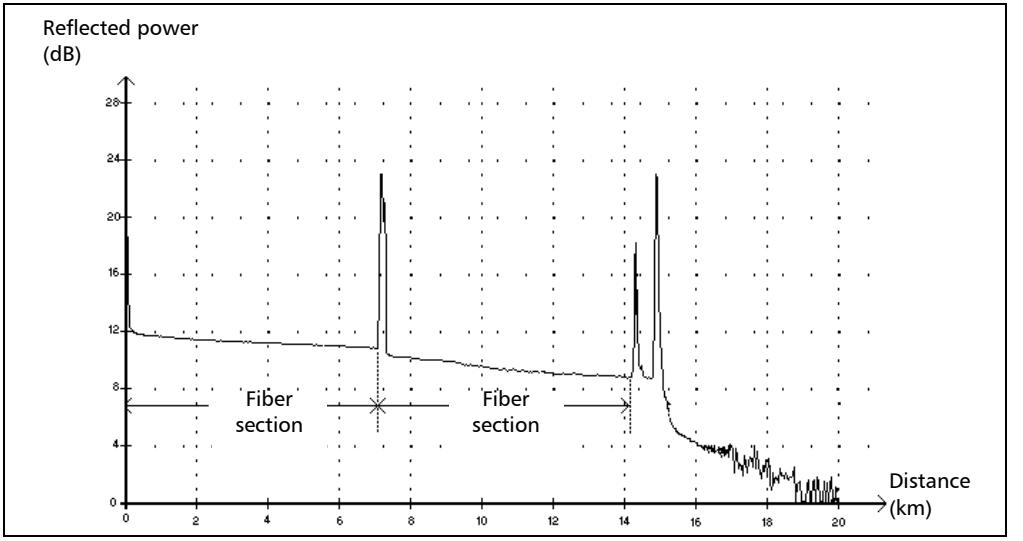
This symbol denotes a reflective event combined with one or more other reflective events. It also indicates the total loss produced by the merged reflective events following it in the events table.

- A Merged Reflective Event is composed of reflective events. Only the Merged Reflective Event is attributed a number in the events table, not the reflective subevents composing it, if they are displayed.
- Reflective events may indicate the presence of connectors, mechanical splices, or poor-quality fusion splices or cracks.
- A reflectance value is specified for all merged reflective events and indicates the maximum reflectance for the merged event.

  A reflectance value is also displayed for each subevent composing the Merged Reflective Event.

- The total loss (Δ dB) produced by the events is measured by plotting two straight lines.
  - The first line is plotted by fitting, through least-square approximation, trace points in the linear area preceding the first event.
  - The second line is plotted by fitting, through least-square approximation, trace points in the linear area following the second event. If there were more than two merged events, this line would be plotted in the linear area following the last merged event. This line is then projected toward the first merged event.
  - The total loss (Δ dB) equals the power difference between the point where the first event begins (point A) and the point on the projected straight line located just below the first event (point B).
  - No loss value can be specified for the subevents.

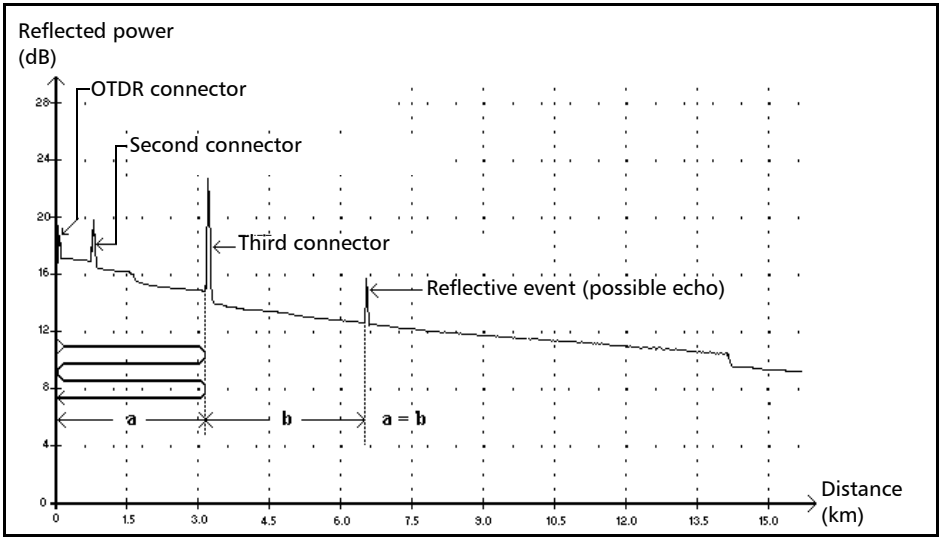
Fiber Section ⊢



This symbol denotes a fiber section with no event.

- The sum of all fiber sections contained in an entire fiber trace equals the total fiber length. Detected events are distinct—even if they cover more than one point on the trace.
- A loss value is specified for fiber section events. No reflectance is specified for this type of event.
- The attenuation (dB/distance in kilometers) is obtained by dividing the loss by the fiber section length.

Reflective Event (Possible Echo)



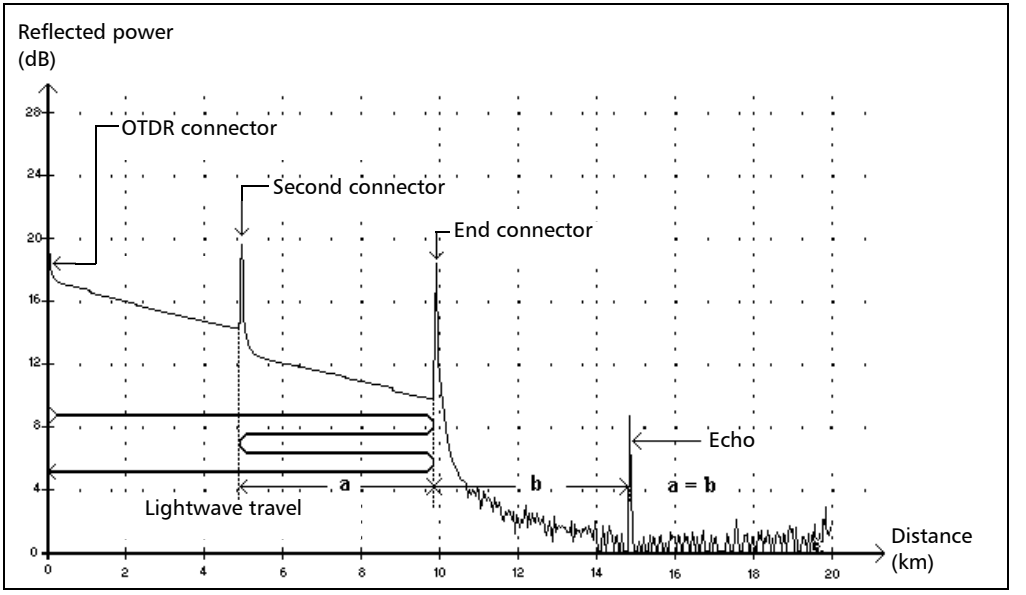
This symbol indicates a reflective event that can be a real reflection or an echo produced by another stronger reflection located closer to the source.

- In the example above, the launched pulse hits the third connector, is reflected back to the OTDR and reflected again into the fiber. It then reaches the third connector a second time and is reflected once more to the OTDR.

  The application would therefore detect a reflective event located at twice the distance of the third connector. Since this event is almost null (no loss), and since its distance is a multiple of the third connector distance, The application would interpret it as a possible echo.

- A reflectance value is specified for reflective events (possible echo).

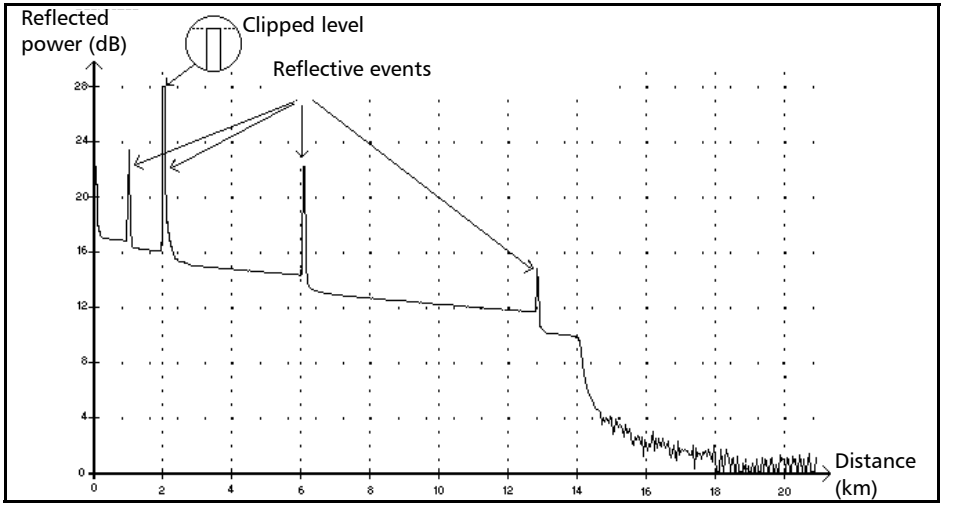
Echo



This symbol indicates that a reflective event has been detected after the end of the fiber.

- In the example above, the launched pulse travels up to the end connector and is reflected back toward the OTDR. Then, it reaches the second connector and is reflected again toward the end connector. It is then reflected back to the OTDR.
- The application interprets this new reflection as an echo because of its characteristics (reflectance and particular position with respect to other reflections).
- The distance between the second connector reflection and the end connector reflection is equal to the distance between the end connector reflection and the echo.
- There is no loss specified for echo events.

Reflective Event



Reflective events appear as spikes in the fiber trace. They are caused by an abrupt discontinuity in the index of refraction.

- Reflective events cause a significant portion of the energy initially launched into the fiber to be reflected back toward the source.
- Reflective events may indicate the presence of connectors, mechanical splices, or even poor-quality fusion splices or cracks.
- Normally, loss and reflectance values are specified for reflective events.
- When the reflective spike reaches the maximum level, its top may be clipped due to the saturation of the detector. As a result, the dead zone—minimum distance for making a detection or attenuation measurement between this event and a second nearby—may be increased.
- If you set thresholds, the application indicates a reflective fault in the events table, whenever a value exceeds the reflectance or connector loss threshold.

B Measuring Chromatic Dispersion: Theory

EXFO's Chromatic Dispersion Analyzer applies the phase-shift method, which consists of measuring the phase variation of a sinusoidal intensity modulated signal at a specific wavelength to obtain the relative group delay of a fiber. The derivative of the relative group delay calculated from fitted equations on computed results gives the dispersion, the zero-dispersion wavelength and the dispersion slope.

Method behind the Chromatic Dispersion Analyzer

In EXFO's Chromatic Dispersion Analyzer, the light source is a broadband source, which is intensity modulated at a high frequency. This light is injected into the fiber under test and the modulated light travels along the fiber. The high-frequency intensity modulation propagates at a speed that depends on wavelength and polarization. Values are obtained for the differences in travel time between modulation at different wavelengths. The higher the number of wavelengths at which this is done, the more accurate the chromatic dispersion results will be.

The first fixed filter in the receiver extracts the portion of the light that will follow an optical path. A second filter, which is a time-tunable filter, will extract a second part of the original signal and then follow a different optical path.

Different path combinations are added using a chopper. The amplitude of the high-frequency signals are measured and digitized. The phase difference is then computed using the different amplitudes. This value is stored along with the tunable filters position and a new measurement cycle begins. A new time delay is computed and stored with wavelength data. When sufficient data is accumulated, chromatic dispersion can be computed.

Using Data Fits to Obtain Dispersion

This section gives you details about the way EXFO uses the data fits to obtain dispersion. Once group delays are computed, equations are fitted in order to obtain dispersion, dispersion slope and zero-dispersion wavelengths. The dispersion curve of typical singlemode fibers follows certain equations used to interpolate zero-dispersion wavelength and slope. The following table graph shows the equations applied to singlemode fibers in specific wavelength ranges.

Fiber Type and Wavelength Range	Expression for D
G.652 NDSF $1200\ \text{nm} \le \lambda \le 1600\ \text{nm}$	$\tau(\lambda) = A + B\lambda^2 + C\lambda^{-2}$ $D(\lambda) = 2(B\lambda - C\lambda^{-3})$
G.653 DSF 1500 nm-1600 nm	$\tau(\lambda) = A + B\lambda^2 + C\lambda$ $D(\lambda) = 2B\lambda + C$
G.655 NZDSF up to 1560 nm	$D(\lambda) = \left\{\left[\frac{D(1560) - D(1530)}{30}\right]^{\circ} \cdot (\lambda - 1560)\right\} + D(1560)$
G.655 NZDSF 1530 nm-1565 nm (C Band)	$D(\lambda) = \left\{\left[\frac{D(1565) - D(1530)}{35}\right]^{\circ} \cdot (\lambda - 1565)\right\} + D(1565)$
1565 nm-1625 nm (L Band)	$D(\lambda) = \left\{\left[\frac{D(1625) - D(1565)}{60}\right]^{\circ} \cdot (\lambda - 1625)\right\} + D(1625)$
G.653 DSF $1200\ \text{nm} \le \lambda \le 1600\ \text{nm}$	$\tau(\lambda) = A + B\lambda + C\lambda\ln(\lambda)$ $D(\lambda) = B + C + C\ln(\lambda)$

Fiber Type and Wavelength Range	Expression for D
50/125 $50nm \le \lambda \le 1450nm$	$\tau(\lambda) = A + B\lambda^2 + C\lambda^{-2}$ $D(\lambda) = 2(B\lambda - C\lambda^{-3})$
62.5/125 $750nm \le \lambda \le 1450nm$	$\tau(\lambda) = A + B\lambda^2 + C\lambda^{-2}$ $D(\lambda) = 2(B\lambda - C\lambda^{-3})$
G.655 NZDSF 1530 nm-1565 nm	$D(\lambda) = \left\{\left[\frac{D(1565) - D(1530)}{35}\right]^{\circ} \cdot (\lambda - 1565)\right\} + D(1565)$

As the previous table demonstrates, specific fits are recommended for specific types of fiber and specific wavelength ranges. Fits should be used carefully when extrapolating parameters to obtain maximum precision.

- The 3-Term Sellmeier applies mostly to standard fibers with single zero dispersion at 1300 nm.
- The 5-Term Sellmeier has five zero crossings. Since it is extremely elastic, it should be used with caution when extrapolating because the fit may curve away from the true results beyond fitted points.
- The same warning applies to the cubic fit.
- The lambda-log-lambda fit is applicable to dispersion-shifted fibers with a zero dispersion wavelength in the 1550 nm wavelength region.
- The linear fit is useful when there are too few measurements for multiple parameter fits to be used. It is applicable to all fibers if the range is sufficiently small.

The fits will give you a tool to obtain the dispersion slope and zero-dispersion point.

Helping You Manage Chromatic Dispersion

The zero-dispersion wavelength (where dispersion is at zero) corresponds to the wavelength point at which the fiber under test reaches its maximum bandwidth. The slope from this zero-dispersion point indicates how fast dispersion rises as wavelength increases. Key chromatic dispersion parameters are the dispersion zero and the slope at zero dispersion.

Getting precise chromatic dispersion parameters helps you choose the right dispersion-compensated fiber or material in order to reverse the dispersion and dispersion slope before the data is interpreted by the receiver at the other end of the line.

The effects of chromatic dispersion decrease with a reduction in the absolute value of the fiber chromatic dispersion or with dispersion compensation.

C Measuring Polarization Mode Dispersion: Theory

The dispersion phenomenon is described as a number of non-intensity-dependant physical occurrences resulting directly in signal loss (pulse spreading or time jitter in a digital system; distortion in an analog system). PMD is an important type of signal dispersion. As unrepeated link distances are increased and transmission rates pushed upwards, PMD can significantly reduce system performance.

To better understand the impact of PMD, consider the example of a pulse passing through a wave plate. Upon entering the wave plate, the pulse is decomposed into polarization components aligned with each of the two birefringent axes of the plate (known as the fast and slow axes). The components propagating independently through the wave plate at different group velocities will recombine at the end of the wave plate as a superposition of two pulses split in time.

The delay between those pulses is designated as the differential group delay (DGD) and is written as $\delta\tau$. For a Gaussian, unchirped input pulse of rms width $\sigma 0$, the rms width at the output is given by

$$\sigma^2 = \sigma_0^2 + r_0(1 - r_0) \bullet \delta\tau^2$$

where $r0$ is the fraction of the input-pulse energy launched into one of the birefringence axes.

Worst-case spreading occurs when the signal is perfectly split in two ($r0 = 1/2$), while no spreading occurs if the input state of polarization (SOP) of the launched signal is aligned with one of the birefringence axes.

To generalize this example, consider a long, weakly birefringent telecommunications fiber as a concatenation of many, randomly orientated birefringent wave plates. Each interface between two wave plates redistributes the optical energy along both axes of the subsequent wave plate. This transfer of energy is called mode coupling.

In a long fiber, numerous mode-coupling events occur along the fiber length, so that light emerging from the output end is the superposition of a number of pulses with different delays. Nonetheless, it turns out that for any given optical frequency, ω, one can always find two orthogonal input principal states of polarization (PSPs) such that a light pulse with the same input SOP as the input PSP, undergoes no spreading. For a single wave plate, the PSPs are the two birefringent axes, whereas for a concatenation of wave plates, neither the input nor the output PSPs correspond to the alignment of the birefringent axes anywhere.

Contrary to the case of a wave plate, the DGD and PSPs of a long fiber are dependent on wavelength and fluctuate in time as a result of environmental variations such as temperature, external mechanical constraints, etc. Their behavior is random, both as a function of wavelength at a given time and as a function of time at a given wavelength. Fortunately, this behavior can be characterized statistically. It can be demonstrated that the probability density function of $\delta\tau$ is Maxwellian and, by definition, PMD is its rms value, that is:

$$\mathrm{PMD} = \sqrt{\mathrm{DGD}^2}$$

Note: *PMD is sometimes defined as the mean value of the DGD, which for a Maxwellian distribution yields a value 17 % lower than the rms definition.*

If the average is calculated over ω, PMD is stable in time, provided that the averaging window is sufficiently large ($\Delta\omega\delta\tau >> 1$).

It is essential to keep in mind that DGD fluctuates in time and can be either smaller or larger than its rms value or PMD. This results in a statistical probability that a pulse (information bit) is broadened, and leads to the eventual impaired ability of the receiver to efficiently decode the information. This adverse PMD effect makes it a critical phenomenon in limiting transmission of high-bit-rate information.

In the case of PMD in a long fiber, there is a specific state called input PSP. In this state, when the input SOP of the signal is aligned with one of its axes, it will propagate through the fiber without any spreading or distortion of the signal. This phenomenon is defined as this specific input SOP such that the output SOP is independent of optical frequency. Again, the worst case occurs when the signal is equally split between both input PSPs.

For long telecom fibers with random coupling of energy between modes (that is. L >> h, where h is the coupling length), PMD grows as the square root of the distance, whereas PMD of strong HiBi fiber (negligible mode coupling) is directly proportional to the distance. Therefore, the PMD coefficient for negligible mode coupling is expressed as ps/km, while the PMD coefficient for random mode coupling is defined as ps/$km^{1/2}$.

D Report Samples

This section presents samples of some reports you can generate using FastReporter. Keep in mind that those reports are samples and your final results may differ depending on the options and number of files you have selected.

For display quality purposes, some reports are in portrait format and others in landscape format.

Bidirectional OTDR

OTDR Bidirectional Report

General Information Bidir 1310nm

Filename:	Bidir00001_1310.bdr	Cable ID:	Cable01
Test date:	4/12/2007	Fiber ID:	Fiber0025
Test time:	10:26 PM (GMT+05:30)	Customer:	Customer01
Job ID:	Job01	Company:	Company01

Location A

Location:	Location01
Operator:	Operator01
Unit's model:	S7300D
Unit's s/n:	

Location B

Location:	Location01
Operator:	Operator01
Unit's model:	S7300D
Unit's s/n:	

Test Parameters A->B

Wavelength:	1310 nm (9 µm)
Range:	55.0000 km
Pulse:	1.0 µs
Duration:	45 s

B->A

1310 nm (9 µm)
55.0000 km
1.0 µs
45 s

Test Settings A->B

IOR:	1.468000
Backscatter:	-79.50 dB
Helix factor:	0.00 %
Splice loss threshold:	0.020 dB
Reflectance threshold:	-72.0 dB
End-of-fiber threshold:	5.000 dB

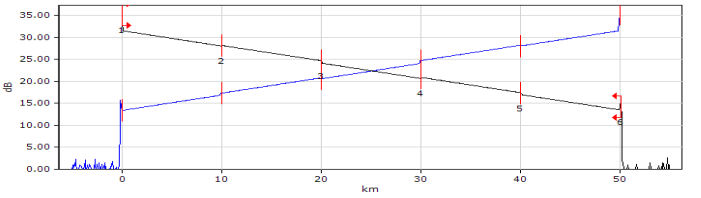
B->A

1.468000
-79.50 dB
0.00 %
0.020 dB
-72.0 dB
5.000 dB

Results

Span length:	50.0003 km	Average loss:	0.362 dB/km
Span loss:	18.102 dB	Average splice loss:	0.154 dB
Maximum splice loss:	0.191 dB		

Graphic



EXFO **Signature:** _____ **Date:** 4/6/2011 Page 1 of 6

PMD

PMD Report

General Information

Filename :	111CNP2004_03_24_07_47_58.p	Cable ID :	
Test date :	3/24/2004	Fiber ID :	111CNP001
Test time :	7:47 AM	Customer :	
Job ID :		Company :	
Comments :			

Location A

Location :
Operator :
Unit's model :
Unit's s/n : PmdB_DEMO3

Location B

Location :
Operator :

Results

PMD :	0.3260 ps	Measured fiber length:	---
Coefficient :	0.0320 ps/km^1/2		

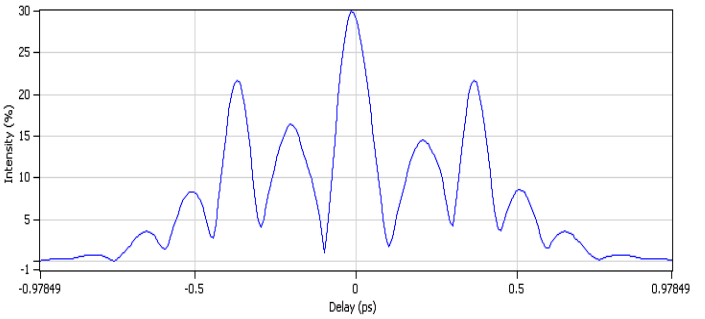
Test Parameters

From : 1518.47 nm
To : 1650.94 nm

Test Settings

Fiber length : 104.140 km

Graphic



Signature: _____ **Date:** 12/6/2007 Page 1 of 2

CD

Chromatic Dispersion Report

General Information

Filename :	fiber 75.exfocd	Cable ID :	
Test date :	4/23/2003	Fiber ID :	Fiber75
Test time :	5:50 PM	Customer :	
Job ID :		Company :	
Comments :			

Location A

Location :	
Operator :	
Unit's model :	FTB-5800
Unit's s/n :	0000225631

Location B

Location :	
Operator :	
Unit's model :	
Unit's s/n :	

Results

Lambda Zero (nm)	Slope (ps/(nm^2))
1294.893	1.013148

Dispersion at 1550 nm :	201.366 ps/nm
Maximum Dispersion :	245.581 ps/nm
Measured Fiber Length:	---

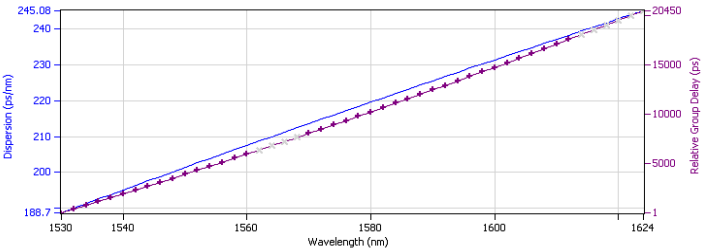
Test Parameters

Acq. From :	1530.0 nm	Step :	2 nm
Acq. To :	1624.9 nm	Time :	1 s

Test Settings

Results From :	1530 nm	Fiber type :	Standard Fiber
Results to :	1625 nm	RGD data Fit :	3-Term Sellmeier
Fiber length :	11.560 km		

Graphic



Signature: _____ **Date:** 12/4/2007 Page 1 of 3

CD and PMD

CD + PMD Report

General Information

Filename :	CDPMD OC192 Fiber005.cdpmd	Cable ID :	Cable
Test date :	10/5/2007	Fiber ID :	Fiber005
Test time :	10:30 AM(GMT-05:00)	Customer :	John Doe
Job ID :	JOB ID 900 WER	Company :	Your Company
Comments :			

Location A

Location :	Chicago
Operator :	Jane Doe
Unit's model :	FTB-5700-CD-PMD-EI-EUI
Unit's s/n :	Alpha10

Location B

Location :	Seattle
Operator :	

CD Results

Dispersion @ 1550 nm :	---
Maximum dispersion :	---
Measured fiber length :	---

PMD Results

PMD :	1.14 ps
Coefficient :	0.5408 ps/km^1/2
Measured fiber length :	4.465 km

Test Parameters

From :	
To :	

Test Parameters

From :	1625 nm
To :	1500 nm
Fiber type :	Telecom

Test Settings

Results from :	
Results to :	
Fiber type :	
RGD data fit :	

CD Table

Wavelength (nm)	Dispersion (ps/nm)	Dispersion Coef. (ps/nm *km)

Signature: _____ **Date:** 12/6/2007 Page 1 of 1

FASTEST

FasTesT Report

General Information

Filename :	FT930.olts	Cable ID :	FT
Test date :	9/9/2004	Fiber ID :	FIB001
Test time :	10:24 AM	Customer :	-
Job ID :	-	Company :	-
Comments :	-		

Location A

Location :	-
Operator :	-
Unit's model :	FOT-930
Unit's s/n :	261348

Location B

Location :	-
Operator :	-
Unit's model :	FOT-930
Unit's s/n :	264788

FasTesT

Fiber ID	Wave length (nm)	Loss A->B (dB)	Ref. A->B (dB)	Loss B->A (dB)	Ref. B->A (dB)	Average (dB)	ORL A->B (dB)	ORL B->A (dB)	Length (km)
FIB001	1310	35.18	0.00	30.73	0.00	32.40	51.47	20.21	8.454
	1490			28.99	0.00			18.51	
	1550	32.16	0.00	28.42	0.00	29.90	53.06	18.23	

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OTDR

OTDR Report

General Information

Filename :	Position 30 ns 2.trc	Cable ID :	
Test date :	9/26/2005	Fiber ID :	
Test time :	4:46 PM(GMT-05:00)	Customer :	
Job ID :		Company :	
Comments :	Simulated Trace		

Location A

Location :	
Operator :	
Unit's model :	Simulateur Pico
Unit's s/n :	

Location B

Location :	
Operator :	

Results

Span length :	1.2986 km	Average splice loss :	0.608 dB
Span loss :	2.025 dB	Maximum splice loss :	0.811 dB
Average loss :	1.560 dB/km	Span ORL :	17.86 dB

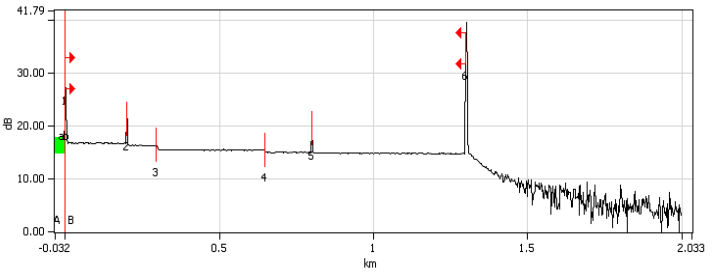
Test Parameters

Wavelength :	1550 nm (9 µm)	Duration :	45 s
Range :	2.0000 km	High resolution :	No
Pulse :	30.00 ns	Resolution	0.638 m

Test Settings

IOR :	1.468890	Splice loss threshold :	0.005 dB
Backscatter :	-82.82 dB	Reflectance threshold :	-85.0 dB
Helix factor :	0.00 %	End-of-fiber threshold :	5.000 dB

Graphic



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PMD Average per Fiber

PMD Average by Fiber Report

General Information

Filename :	111CNP2004_03_24_07_47_58.pmdB	Cable ID :	
Date :	3/24/2004	Fiber ID :	111CNP001
Time :	7:47 AM; 7:48 AM	Customer :	
Job ID :		Company :	
Comments :			

Location A

Location :	
Operator :	
Unit's model :	
Unit's s/n :	PmdB_DEMO3

Location B

Location :	
Operator :	

Test Parameters

From :	1518.47 nm	Fiber type :	Telecom
To :	1650.94 nm		

Test Settings

Fiber length : 104.140 km

Statistics

Test Date/Time	PMD Delay (ps)	PMD Coef. (ps/km^1/2)	PMD Delay, 2nd order (ps/nm)	PMD Coef., 2nd order (ps/nm*km)	Gaussian Compliance	Used for statistics
3/24/2004 7:47:58 AM	0.3260	0.0320	0.0476	0.0005	0.926	Yes
3/24/2004 7:48:04 AM	0.3270	0.0321	0.0479	0.0005	0.921	Yes
Minimum	0.3260	0.0320				
Maximum	0.3270	0.0321				
Average	0.3270	0.0320				
Standard Deviation	0.0010	0.0001				

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OTDR Cable

OTDR Cable Report

Event Loss

	Event 1 Launch Level 0.0000 km		Event 2 Non-Reflective Event 1.6946 km		Event 3 Non-Reflective Event 25.2708 km		Event 4 Positive Event 29.6949 km		Event 5 Reflective Event 34.1740 km		Event 6 Reflective Event 42.6655 km	
	Loss (dB)	Refl (dB)	Loss (dB)	Refl (dB)	Loss (dB)	Refl (dB)	Loss (dB)	Refl (dB)	Loss (dB)	Refl (dB)	Loss (dB)	Refl (dB)
Fiber0001 (1550 nm) (Pass)		-46.7			0.349		-0.021		0.776	-24.7		-40.3
Fiber0001 (1310 nm) (Pass)		-48.2			0.415		0.138		0.964	-24.4		-38.3
Fiber0001 (1310 nm) (Fail)		-48.2	0.003		0.415		0.138		0.964	-24.4		-38.3
Fiber0001 (1550 nm) (Fail)		-46.7	0.002		0.349		-0.021		0.776	-24.7		-40.3
Fiber0002 (1310 nm) (Fail)		-49.2			0.415		0.139		0.965	-24.4		-38.2
Fiber0002 (1550 nm) (Pass)		-47.7	0.000		0.349		-0.020		0.781	-24.7		-40.4
Fiber0002 (1550 nm) (Fail)		-47.7			0.349		-0.020		0.781	-24.7		-40.4
Fiber0002 (1310 nm) (Pass)		-49.2	0.004		0.415		0.139		0.965	-24.4		-38.2
Min		-49.2	0.000		0.349		-0.021		0.776	-24.7		-40.4
Max		-46.7	0.004		0.415		0.139		0.965	-24.4		-38.2
Average		-48.0	0.002		0.382		0.059		0.872	-24.6		-39.3

	Max. Loss (dB)	AverageSplice Loss (dB)	Total Loss (dB)	ORL (dB)
Fiber0001 (1550 nm) (Pass)	0.776	0.003	0.379	31.46
Fiber0001 (1310 nm) (Pass)	0.964	0.002	0.630	31.73
Fiber0001 (1310 nm) (Fail)	0.964	0.164	16.414	31.73
Fiber0001 (1550 nm) (Fail)	0.776	0.277	10.530	31.45
Fiber0002 (1310 nm) (Fail)	0.965	0.164	16.397	31.75
Fiber0002 (1550 nm) (Pass)	0.781	0.004	0.381	31.48

EXFO **Signature:** _____ **Date:** 29-Mar-2011

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Fiber Characterization

Fiber Characterization Report

General Information

Cable ID: Cable001 Customer: TopNetWork; Rediff; Company: ExpertCable; india; ; Expert

Fiber Characterization

Fiber ID	CD @ 1550 nm		PMD		OLTS							OTDR		
	Dispersion (ps/nm)	Coef. (ps/nm*km)	Delay (ps)	Coef. (ps/km½)	Wave length (nm)	Loss A->B (dB)	Loss B->A (dB)	Average Loss (dB)	ORL A->B (dB)	ORL B->A (dB)	Length (km)	Length (km)	Max Splice (dB)	Avg Splice (dB)
Fiber001;	201.366	17.419	2.2010	0.5502	1310	---	---	---	>3.00	-Infinity		8.4921		
					1450	0.00	---	---	-Infinity	-Infinity				
					1480	-0.03	---	---	-Infinity	-Infinity				
					1490	---	-41.30	---	-Infinity	111.29	0.005			
					1550	-49.52	-41.70	-47.18	100.00	112.39	0.005	8.4936	0.032	0.021
					1625	-49.80	---	---	100.00	-Infinity	0.005	0.0000	0.585	0.585
Fiber001;						---	---	---						

Duplicated Measurement

Duplicated Measurements Report

Unit serial number	Test Date/Time	Identifiers	Filename
203142	02-Jul-2008 7:12 AM (GMT+05:30)	Fiber001; Cable001	Fiber83_1550.bdr
203142	02-Jul-2008 7:12 AM (GMT+05:30)	Fiber001; Cable001	Fiber83_1625.bdr
203142	02-Jul-2008 7:12 AM (GMT+05:30)	Fiber83	Fiber83_1550.bdr
203142	02-Jul-2008 7:12 AM (GMT+05:30)	Fiber83	Fiber83_1625.bdr
449821	06-Jan-2009 8:30 PM (GMT+05:30)	Fiber001; Cable001; c	OLT 01_001_2009-01-06.ppm
449821	06-Jan-2009 8:30 PM (GMT+05:30)	a; b; c	OLT 01_001_2009-01-06.ppm
0000225634	13-Sep-2003 1:10 PM	Fiber001; Cable001	GOOOWI.exfocd
0000225634	13-Sep-2003 1:10 PM	GOOOWI016; GOOOWI	GOOOWI.exfocd
0000225634	13-Sep-2003 1:12 PM	Fiber001; Cable001	GOOOWI.exfocd
0000225634	13-Sep-2003 1:12 PM	GOOOWI017; GOOOWI	GOOOWI.exfocd
0000225634	13-Sep-2003 1:15 PM	Fiber001; Cable001	GOOOWI.exfocd
0000225634	13-Sep-2003 1:15 PM	GOOOWI018; GOOOWI	GOOOWI.exfocd
0000225634	13-Sep-2003 1:16 PM	Fiber001; Cable001	GOOOWI.exfocd
0000225634	13-Sep-2003 1:16 PM	GOOOWI019; GOOOWI	GOOOWI.exfocd
0000225634	13-Sep-2003 1:18 PM	Fiber001; Cable001	GOOOWI.exfocd
0000225634	13-Sep-2003 1:18 PM	GOOOWI020; GOOOWI	GOOOWI.exfocd
0000225634	13-Sep-2003 1:19 PM	Fiber001; Cable001	GOOOWI.exfocd

Signature: _____ **Date:** 19-Jan-2011

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PPM Service Activation

PPM (FTTx) Service Activation Report

General Information

Filename:	OLT 01_001_2009-01-06.ppm	OLT:	Fiber001
Test date:	06-Jan-2009	ONT:	Cable001
Test time:	8:30 PM (GMT+05:30)	Customer:	
Job ID:	NO JOB	Company:	
Comments:			

Unit

Unit's model:	PPM-352C-EA	Unit's s/n:	449821

Results

				Pass/Fail/Warning Thresholds			Fail
Location	Wavelength (nm)	Power (dBm)	Status	Power Limit	Fail (dBm)	Warning (dBm)	Date/Time
c	1310 (Upstream)	Low	Fail	Maximum	7.0	---	06-Jan-2009 8:30 PM (GMT+05:30)
				Minimum	2.0	3.0	
	1490 (Downstream)	Low	Fail	Maximum	-4.0	---	
				Minimum	-26.0	-23.0	
	1550 (Video)	Low	Fail	Maximum	7.0	---	
				Minimum	-13.5	-10.5	

EXFO **Signature:** _____ **Date:** 19-Jan-2011 Page 1 of 1

Optical Power Meter

Optical Power Meter Report

General Information

Filename: / 550).ppm
Customer: Cu
Test date: ·
Company: Co
Job ID: I
Comments:

Unit

Unit's model:
Unit's s/n: 449819

Pass/Fail Thresholds

Predefined Thresholds: Custom from file

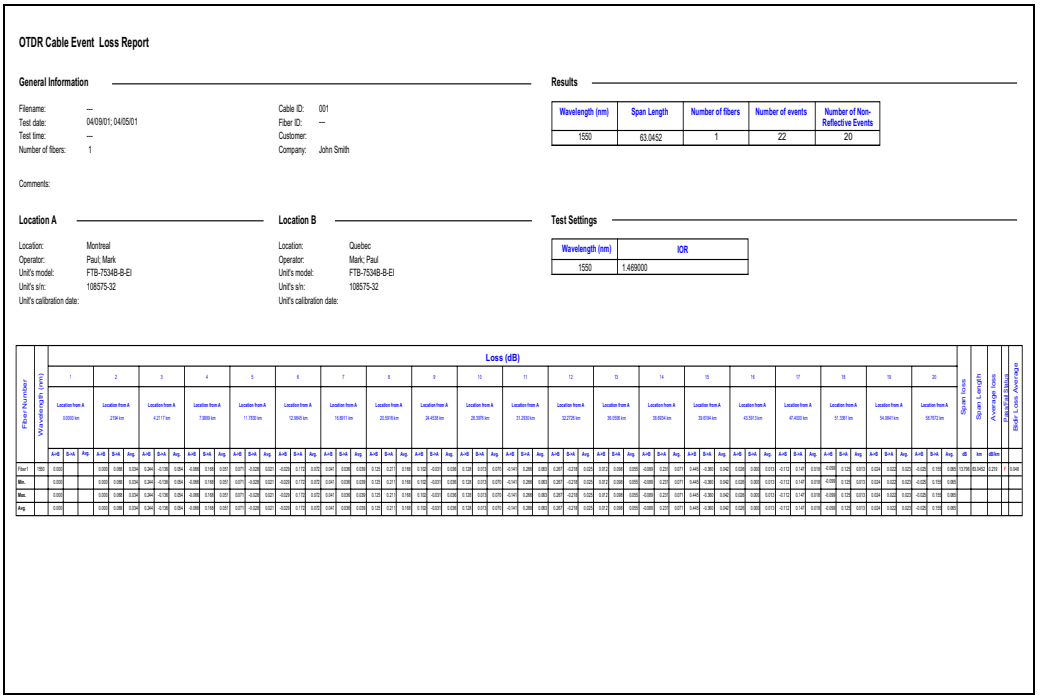
Wavelength (nm)	Minimum Power	Minimum Relative Power (dB)
1		0.00

Results

OLT	ONT	Location	Wavelength (nm)	Power	Relative Power (dB)	Reference (dBm)
OLT 01	001	**ONT**	1260		6.3	-8.8
OLT 01	001	**ONT**	1260		6.3	-8.8

Signature: _____ **Date:** 4/6/2011 Page 1 of 1

OTDR Cable Event Loss (20)



OTDR Cable Event Loss Report

General Information

Filename: –
Test date: 04/09/01; 04/05/01
Test time: –
Number of fibers: 1

Cable ID: 001
Fiber ID: –
Customer: –
Company: John Smith

Comments:

Results

Wavelength (nm)	Span Length	Number of fibers	Number of events	Number of Non-Reflective Events
1550	63.0452	1	22	20

Location A

Location: Montreal
Operator: Paul; Mark
Unit's model: FTB-7534B-B-EI
Unit's s/n: 108575-32
Unit's calibration date:

Location B

Location: Quebec
Operator: Mark; Paul
Unit's model: FTB-7534B-B-EI
Unit's s/n: 108575-32
Unit's calibration date:

Test Settings

Wavelength (nm)	IOR
1550	1.469000

Loss (dB)

Fiber Number	Wavelength (nm)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Span loss	Span Length	Average loss	Fiber Attn	Slope Loss Average
		Location from A 0.0000 km	Location from A 2.164 km	Location from A 4.217 7 km	Location from A 7.0869 km	Location from A 11.7530 km	Location from A 12.9645 km	Location from A 19.6811 km	Location from A 20.5918 km	Location from A 24.4538 km	Location from A 28.3976 km	Location from A 31.2930 km	Location from A 32.2726 km	Location from A 36.0558 km	Location from A 38.6054 km	Location from A 39.6194 km	Location from A 43.5913 km	Location from A 47.4593 km	Location from A 51.3361 km	Location from A 54.8941 km	Location from A 58.7672 km					
		A->B / B->A / Avg																				dB	km	dB/km		
Fiber1	1550	0.000 / 0.000 / 0.000	0.000 / 0.000 / 0.000	0.344 / -0.156 / 0.094	-0.088 / 0.168 / 0.051	0.071 / -0.028 / 0.021	-0.020 / 0.172 / 0.072	0.347 / 0.094 / 0.220	0.123 / 0.21 / 0.166	0.102 / -0.031 / 0.036	0.125 / 0.071 / 0.098	-0.141 / 0.295 / 0.063	0.307 / -0.216 / 0.020	0.812 / 0.094 / 0.453	0.055 / -0.089 / -0.017	0.227 / 0.071 / 0.149	0.445 / -0.393 / 0.026	0.042 / 0.026 / 0.034	0.000 / 0.013 / 0.007	-0.170 / 0.147 / -0.012	0.018 / 0.066 / 0.042	0.125 / 0.070 / 0.097	0.024 / 0.022 / 0.023	-0.029 / 0.159 / 0.065	0.065	13.796	63.045	0.219	0.048
Min.		0.000 / 0.000 / 0.000	0.000 / 0.000 / 0.000	0.344 / -0.156 / 0.094	-0.088 / 0.168 / 0.051	0.071 / -0.028 / 0.021	-0.020 / 0.172 / 0.072	0.347 / 0.094 / 0.220	0.123 / 0.21 / 0.166	0.102 / -0.031 / 0.036	0.125 / 0.071 / 0.098	-0.141 / 0.295 / 0.063	0.307 / -0.216 / 0.020	0.812 / 0.094 / 0.453	0.055 / -0.089 / -0.017	0.227 / 0.071 / 0.149	0.445 / -0.393 / 0.026	0.042 / 0.026 / 0.034	0.000 / 0.013 / 0.007	-0.170 / 0.147 / -0.012	0.018 / 0.066 / 0.042	0.125 / 0.070 / 0.097	0.024 / 0.022 / 0.023	-0.029 / 0.159 / 0.065	0.065				
Max.		0.000 / 0.000 / 0.000	0.000 / 0.000 / 0.000	0.344 / -0.156 / 0.094	-0.088 / 0.168 / 0.051	0.071 / -0.028 / 0.021	-0.020 / 0.172 / 0.072	0.347 / 0.094 / 0.220	0.123 / 0.21 / 0.166	0.102 / -0.031 / 0.036	0.125 / 0.071 / 0.098	-0.141 / 0.295 / 0.063	0.307 / -0.216 / 0.020	0.812 / 0.094 / 0.453	0.055 / -0.089 / -0.017	0.227 / 0.071 / 0.149	0.445 / -0.393 / 0.026	0.042 / 0.026 / 0.034	0.000 / 0.013 / 0.007	-0.170 / 0.147 / -0.012	0.018 / 0.066 / 0.042	0.125 / 0.070 / 0.097	0.024 / 0.022 / 0.023	-0.029 / 0.159 / 0.065	0.065				
Avg.		0.000 / 0.000 / 0.000	0.000 / 0.000 / 0.000	0.344 / -0.156 / 0.094	-0.088 / 0.168 / 0.051	0.071 / -0.028 / 0.021	-0.020 / 0.172 / 0.072	0.347 / 0.094 / 0.220	0.123 / 0.21 / 0.166	0.102 / -0.031 / 0.036	0.125 / 0.071 / 0.098	-0.141 / 0.295 / 0.063	0.307 / -0.216 / 0.020	0.812 / 0.094 / 0.453	0.055 / -0.089 / -0.017	0.227 / 0.071 / 0.149	0.445 / -0.393 / 0.026	0.042 / 0.026 / 0.034	0.000 / 0.013 / 0.007	-0.170 / 0.147 / -0.012	0.018 / 0.066 / 0.042	0.125 / 0.070 / 0.097	0.024 / 0.022 / 0.023	-0.029 / 0.159 / 0.065	0.065				

Fiber Inspection Probe

EXFO **FIP Report** — Fail

General Identification

Filename:	Fiber002.cmax		
Test date:	05-Oct-2010	Test time:	5:08 PM (GMT+05:30)
Job ID:	J001	Customer:	Xyz
Company:	Exfo	Operator:	Pradip
Comments:	Comment's added		

Custom Identification

Fiber ID:	Fiber 001	Connector ID:	2
CableID:	Cable 001	Location:	Quebec

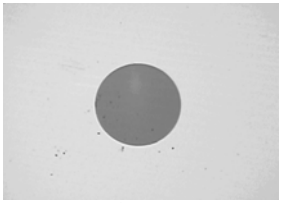
Test Parameters

Configuration:	IEC-61300-3-35 Single-Mode Single-Fiber APC Connector (Standard)		
Connector type:	(SF) Single-Fiber connector	Ratio fail/pass:	1/0
Fiber type:	(SM) Single-Mode fiber	Number of fibers:	1
Polishing type:	(APC) Angle-polished physical contact		

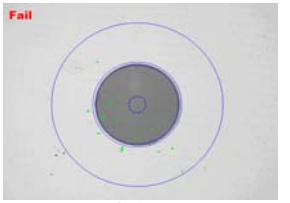
Measurement Information — Fail

Fiber ID:	Fiber 001	Test time:	5:08 PM (GMT+05:30)
Focus level:	87% (Nominal)		

Graphics



Image



Overlay

Results

Zone	Zone diameter	Scratches			Defects			Status
		Criteria	Thresholds	Counts	Criteria	Thresholds	Counts	
A: Core	0µm->25µm	0µm≤size<∞	4	0	0µm≤size<∞	0	0	✓
B: Cladding	25µm->120µm	0µm≤size<∞	any	0	0µm≤size<2µm	any	2	✗
					2µm≤size<5µm	5	11	
					5µm≤size<∞	0	0	
C: Adhesive	120µm->130µm	---	---	---	---	---	---	
D: Contact	130µm->250µm	0µm≤size<∞	any	0	0µm≤size<10µm	any	10	✓
					10µm≤size<∞	0	0	

EXFO **Signature:** _____ **Date:** 29-Mar-2011 Page 1 of 1

iOLM

iOLM Report

Fail

General Information

Filename: Real iOLM + PON.iolm
Test date: 15-Dec-2010
Test time: 6:43 PM (GMT+05:30)
Job ID:
Company:
Comments:
Customer:
Operator:
Unit's model: FTB-730-23B-04B-OPM2-EA
Unit's S/N: 550314

Identifiers

OLT	Splitter A	Splitter B	Drop T.	Redundant Fiber
		1	1	Cable21

iOLM Results

Wavelength (nm)	Link loss (dB)	Link ORL (dB)
1625	8.515	30.09

Link length: 34.293 km
Acquisition status: Completed

iOLM Pass/Fail Thresholds

	1625 nm		
Max. link loss	45.000 dB		
Min. link loss	0.000 dB		
Max. link ORL	15.00 dB		

Max. link length: 10.000 km
Min. link length: 0.0000 km

iOLM Test Parameters

Wavelength(s): 1625 nm

iOLM Test Settings

Launch fiber length: 0.0000 km
Receive fiber length: 0.0000 km
IOR (1550 nm): 1.468325
Backscatter (1550 nm): -81.87 dB

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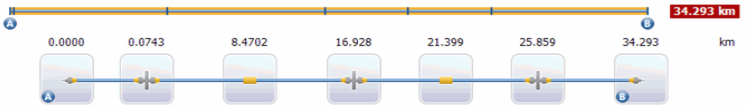
iOLM Report

Fail

Link View



iOLM Table

Element Type	Position (km)	Loss (dB)			Reflectance (dB)		
		1625 nm			1625 nm		
Connector (A)	0.0000	0.455			-61.4		
Connector	0.0743	-0.109			-76.8		
Splice	8.4702	0.472			---		
Connector	16.928	-0.030			-77.7		
Splice	21.399	0.748			---		
Connector	25.859	-0.006			-71.0		
Connector (B)	34.293	---			>-28.5		

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P/N: 1060647

www.EXFO.com · info@exfo.com

CORPORATE HEADQUARTERS	400 Godin Avenue	Quebec (Quebec) G1M 2K2 CANADA Tel.: 1 418 683-0211 · Fax: 1 418 683-2170
EXFO AMERICA	3701 Plano Parkway, Suite 160	Plano TX, 75075 USA Tel.: 1 972 907-1505 · Fax: 1 972 836-0164
EXFO EUROPE	Omega Enterprise Park, Electron Way	Chandlers Ford, Hampshire S053 4SE ENGLAND Tel.: +44 2380 246810 · Fax: +44 2380 246801
EXFO ASIA-PACIFIC	100 Beach Road, #22-01/03 Shaw Tower	SINGAPORE 189702 Tel.: +65 6333 8241 · Fax: +65 6333 8242
EXFO CHINA	Room 2711, Trade Center, No. 4028 Jintian Road, Futian District Beijing Global Trade Center, Tower C, Room 1207, 36 North Third Ring Road East, Dongcheng District	Shenzhen 518035 P. R. CHINA Tel.: +86 (755) 8203 2300 · Fax: +86 (755) 8203 2306 Beijing 100013 P. R. CHINA Tel.: +86 (10) 5825 7755 · Fax: +86 (10) 5825 7722
EXFO SERVICE ASSURANCE	270 Billerica Road	Chelmsford MA, 01824 USA Tel.: 1 978 367-5600 · Fax: 1 978 367-5700
TOLL-FREE	(USA and Canada)	1 800 663-3936

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