

User Manual



TARGET1 **Trace Analysis, Report Generation and** **Emulation Tool**

071-0870-02

This document applies to firmware version 3.00
and above.

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Preface

The Target1 application allows you to work with files produced by the Optical Time Domain Reflectometer (OTDR).

The OTDR Trace Analysis Package has two modes:

- Trace Analysis mode. Use this mode to view individual files or pairs of files (bidirectional and difference pairs) and manipulate them in the same ways that you can with the OTDR. You cannot collect new data, but you can manually adjust events, perform tests, add landmarks, and add notes about the fiber or about events. See *OTDR Trace Analysis Mode* on page 2-1.
- Report Generation mode. Use this mode to view and manipulate data from multiple OTDR files at once. You can generate reports using a wizard that walks you through selecting the files, applying a template, doing additional tests, changing settings, setting limits, and formatting the information for printing. See *OTDR Report Generator Mode* on page 2-49.

Related Documentation

Refer to the manuals and online help of your optical test equipment for detailed information about collecting data.

Manual Conventions

This book uses the following convention to represent menus:

- To open a file, you would be instructed to select **File > Open**. To accomplish this, click **File** in the menubar at the top of the window; then click **Open** in the drop down window.
- Words in italics, such as *event loss*, indicate a glossary term.

Contacting Tektronix

Phone	1-800-833-9200*
Address	Tektronix, Inc. Department or name (if known) 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA
Web site	www.tektronix.com
Sales support	1-800-833-9200, select option 1*
Service support	1-800-833-9200, select option 2*
Technical support	Email: techsupport@tektronix.com 1-800-833-9200, select option 3* 6:00 a.m. - 5:00 p.m. Pacific time

* **This phone number is toll free in North America. After office hours, please leave a voice mail message. Outside North America, contact a Tektronix sales office or distributor; see the Tektronix web site for a list of offices.**



Getting Started

Getting Started

Use the information in this section to install and become familiar with the TARGET1 software.

You receive the following items when you order the TARGET1 trace analysis application:

- TARGET1 CD
- TARGET1 User Manual

When you open the package, check to see that each of these items is included. The software CD is sealed inside an envelope printed with the license agreement. Breaking the seal on the envelope indicates acceptance of the terms of the agreement.

Product Description

The Tektronix TARGET1 Trace Analysis, Report Generation and Emulation Tool allows you to use an IBM-compatible PC Windows platform and color monitor to display and analyze waveforms acquired by a Tektronix optical time-domain reflectometer (OTDR). You can also convert waveform files from some other industry-compatible OTDR manufacturers for analysis using TARGET1.

The TARGET1 software saves time by automating the documentation and analysis tasks for large count fiber bundles. The application delivers a summary report of the fiber data showing parameters that most concern the network engineer or maintenance technician. It also provides a report file that can be saved and printed for record keeping and proof-of-performance documentation.

What Can TARGET1 Do?

Use your OTDR to take measurements on your fiber system and save them on a floppy-disk file or other electronic file server. Copy the files to the PC, and then use the TARGET1 application to manipulate and analyze the measurement data.

Where practical, the PC software reproduces the OTDR functions, including:

- Tektronix OTDR display elements, including the waveform with event and landmark indicators, distance and loss axes, and distance cursors.
- Reads fiber trace files from a floppy disk or a PC hard disk.
- Reads OTDR and mini-OTDR traces.
- All measurement capabilities of an OTDR.

- Two Point loss/distance, Event Loss, Optical Return Loss (ORL), and Reflectance measurement modes, with automatic and manual measurements available.
- Distance cursor readouts provide distance from front panel and A to B distance difference on screen.

Analysis and documentation tools include the following:

- Dual-trace mode to compare waveforms and events.
- Expanded-view function (zoom box) for closer inspection of trace details.
- Event editing for adding, deleting, or moving events and updating measurements to reflect analysis results.
- Landmark marking for recording street locations, manholes, poles, buried closures, or other physical features that can be associated with the locations of the fiber splices, connectors, and other events.
- Event and landmark note editing for adding, deleting, or changing notes to document important fiber information.
- Fiber test file storage on the PC for system documentation, fault location, and preventive maintenance.

Capabilities

In addition, the TARGET1 application can measure trace subtraction (difference), bidirectional events averaging, and apply event templates to OTDR test traces.

The TARGET1 application implements OTDR front-panel control functions using a two- or three-button mouse, the PC keyboard, and measurement and parameter tool bars displayed on the PC screen.

A menu bar appears at the top of the display. Pull-down menus are available for file management and printing functions, view options and settings selections, waveform functions such as event editing and measurements, dual-trace selection, display window selection, remote connection, and online help.

A second menu bar, the tool bar, provides shortcut icons you can use to directly select a feature or function of the application. The tool bar can be customized to show selected sets of shortcut icons.

You can send trace and event tables to a connected printer or save them to a print file.

You can also export waveform graphics, waveform parameters, waveform data, and event-table data for use with document or spreadsheet programs.

Online help provides information on each dialog box with expanded help information available through the help contents and index linking.

File Formats

The TARGET1 application can read and save CFF and SOR files. It can read WFM and EVT format files.

TFP2 files and TFP2A files that were saved in FiberMaster format are directly compatible with the TARGET1 application.

TFS3031 files are in CFF (Tektronix Common File Format), and are directly compatible with TARGET1. If the optical test equipment has a floppy disk drive, you can transfer files from the OTDR to the PC using a floppy disk.

The TARGET1 trace analysis software can read files compatible with the Telcordia SOR (standard optical record) format as defined in Telcordia GR-196-CORE. These include files from Tektronix NetTek OTDRs as well as from other OTDRs that save files compliant with Telcordia GR-196-CORE SOR Version 1.

What You Need to Know

A basic knowledge of your Windows operating system is required to install and operate your TARGET1 application. Familiarity with operation of Tektronix optical signal test equipment is helpful for understanding the functions of the TARGET1 software (refer to the appropriate equipment user manual for details). You must understand the following:

- Windows directory structure and file-naming conventions.
- How to log onto a particular disk drive.
- How to copy, rename, and delete files, and how to create directories.

Recommended Minimum Operating Requirements

The TARGET1 application requires a PC capable of running in Windows 95, 98, 2000, NT, ME, or XP. You will need a mouse and a compact disc reader.

Processor	300 MHz Pentium
Memory	32 MB
Operating System	Windows 95/98, Windows 2000, Windows NT, Windows ME, or Windows XP
Graphics Adapter	VGA or SVGA, 256 colors or better recommended
Monitor	SVGA, 800 x 600 minimum resolution
Fixed Disk Drive	10 MB minimum free
Compact Disk Drive	Required to load the application software
Mouse	Either a two- or three-button Microsoft-compatible mouse.

Printers

Any printer compatible with your version of Windows and for which you have a printer driver set up can be used for printing. A graphics-capable printer is required to output graphic files. A color printer may be used to produce color images for the screen captures and reports.

Installation

The TARGET1 application is provided on a compact disc (CD).

Install the software on your PC as follows:

NOTE. Remove any previous versions of the TARGET1 software prior to installation. Use the Windows Add/Remove Programs utility to remove the TARGET1 software.

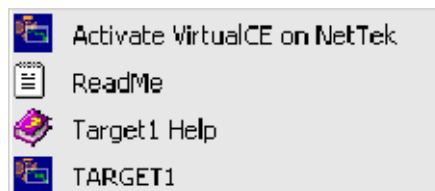
1. Insert the TARGET1 CD-ROM into the CD drive of your PC.
2. Navigate to the contents of the TARGET1 CD-ROM using My Computer or Windows Explorer.

Double click on the file TARGET1_xxxx.exe (where xxxx is the software version number) to run the installation program.

3. Follow the prompts to install the software on your hard drive.

The default destination directory created for the program files is c:\Program_Files\TARGET1. If you want to install the program files in another location, select the **Browse** option to specify another directory.

4. When the installation is complete, examine your **Start > Programs > Tektronix TARGET1** menu. It will contain four icons.
 - Activate VirtualCE on NetTek enables Virtual CE on a connected Tektronix NetTek Analyzer. Refer to page 3-1 for additional information about VirtualCE for the NetTek.
 - ReadMe displays a text file containing tips, information not available at the printing of this manual, and a list of additional files and programs that may be included on the TARGET1 CD-ROM.
 - Target1 Help launches the TARGET1 help system. You can also launch the help system from any of the TARGET1 menus.
 - TARGET1 starts the application.



After Installation

Read the Readme file for operating tips, latest updates, and additional programs and files that are included on the TARGET1 CD-ROM.

If You Need Help

To learn more about the Tektronix optical time-domain reflectometers (OTDR), refer to the appropriate user manual and read the online help for the product.

If you need further assistance with using the TARGET1 software or have special application problems, refer to *Contacting Tektronix* in the *Preface* section of this manual.

Starting the TARGET1 Application

1. To start the installed TARGET1 application, choose **Programs/Tektronix TARGET1/TARGET1** from the **Start** menu.

The application displays the startup dialog box shown in Figure 1-1.

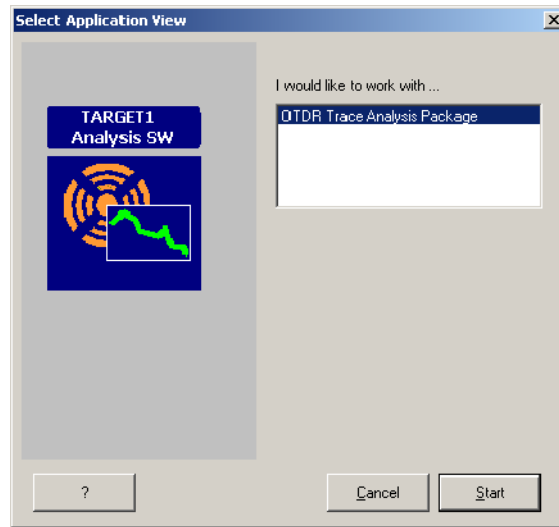


Figure 1-1: Application startup dialog box

2. Select the optical test application you want to use. See *TARGET1 Application Packages* on page 1-8 for more information about your choices.
3. Select the **Start** button to begin.

TARGET1 Application Packages

TARGET1 application packages allow you to work with OTDR (optical time domain reflectometer) data.

OTDR Software Package Modes

There are two modes provided by the OTDR software package:

- **Trace Analysis mode.** When you start the OTDR Trace Analysis Package, you will be in Trace Analysis mode. You can also enter this mode by selecting the **Go to Trace Analysis** button. Use this mode to view individual files or pairs of files (bidirectional and difference pairs) and manipulate them in the same ways that you can with the OTDR. You cannot collect new data, but you can manually adjust events, perform tests, add landmarks, and add notes about the fiber or about events. See *OTDR Trace Analysis Mode* on page 2-1.
- **Report Generation mode.** Select the **Go to Report Generator** button to enter this mode. Use this mode to view and manipulate data from multiple OTDR files at once. You can generate reports using a wizard that walks you through selecting the files, applying a template, doing additional tests, changing settings, setting limits, and formatting the information for printing. See *OTDR Report Generator Mode* on page 2-49.



OTDR Software Package

OTDR Trace Analysis Mode

When you start the OTDR Trace Analysis Package, the program will be in Trace Analysis mode. You can also enter this mode by selecting the **Go to Trace Analysis** button.

In OTDR trace analysis mode, you can view, manipulate, and take measurements on saved OTDR trace data. You can also add or remove events and landmarks from the trace data. You can review, edit, or add notes to the test files. The saved data can be either from local files or downloaded from the file systems of remote test equipment through a remote connection.

The trace area and the measurement table for events are empty until you open a file. See *Open a Trace File* on page 2-1.

Open a Trace File

Measurement data must be loaded into the application to start the display of a test file. Click **File > Open. . .** to display the Open dialog box shown in Figure 2-1. Use the Open dialog box to select and open a saved test file.

Choose the type of files to look for and the drive to look in as follows:

1. Select a file type from the **Files of type:** drop down menu:
 - Standard Optical Record files (*.sor files)
 - Common File Format files (*.cff files, a Tektronix OTDR format)
 - Waveform files (*.wfm files, a Tektronix OTDR format)
 - Event File (*.evt, a Tektronix OTDR format)
 - Display all file types (*.*)

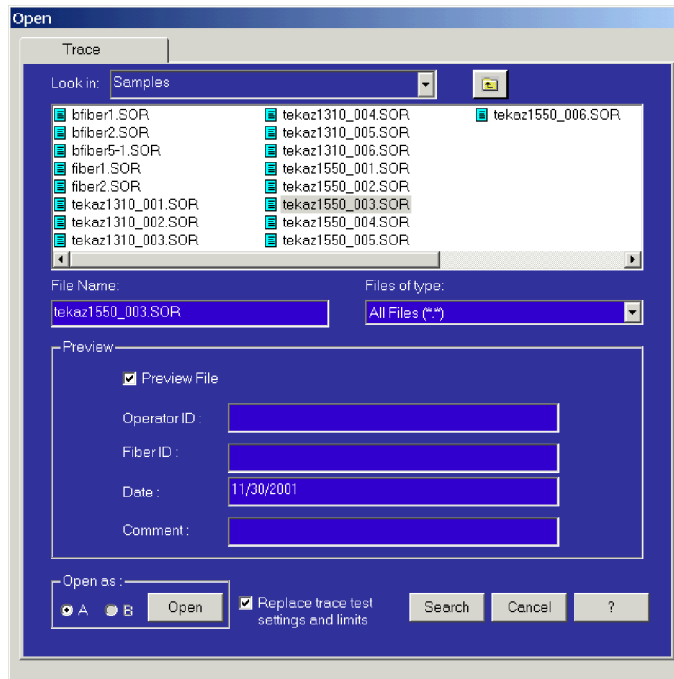



Figure 2- 1: Open file selection dialog box

2. Navigate to the folder you want by clicking in the **Look in:** box. The list shows the local drives on the PC and any networked drives connected to the PC. Click the  symbol to back up the directory tree.

If you can't find the file you want, click the **Search** button to display the Search File(s) dialog box, which enables you to search your drive(s) for files that meet specific criteria. See page 2-19 for more information on searching.

3. Click a file name in the list to select that file. Its name will appear in the **File Name** box.
4. Select **Preview File** to view the fiber notes entered and saved with the trace file. Use the fiber notes (if any are present) to help select a file of interest.
5. Select either **A** or **B** from the **Open as:** selections. This selection is especially important for dual-trace displays. The default selection is the **A** tab in single trace displays, but you can select either one and have a file loaded in either or both A and B. Any new file opened writes over a file already in the selected tab.
6. Click the **Open** button to load the file to the selected tab.

Functional Overview of Trace Analysis Mode

The features, functions, and interface controls for the NetTek Analyzer OTDRs are emulated by the TARGET1 Trace Analysis, Report Generation and Emulation Tool (see Figure 2-2). The first four sections describe the different areas of the TARGET1 application:

- View Options (page 2-4)
- Trace Area (page 2-4)
- Event Table (page 2-9)
- Test Settings Panel (page 2-11)
- Control Panel (page 2-12)
- Menu Selection and Toolbar Button Descriptions (page 2-13)

The application displays views of the trace and event table, a test summary panel, and a control panel.

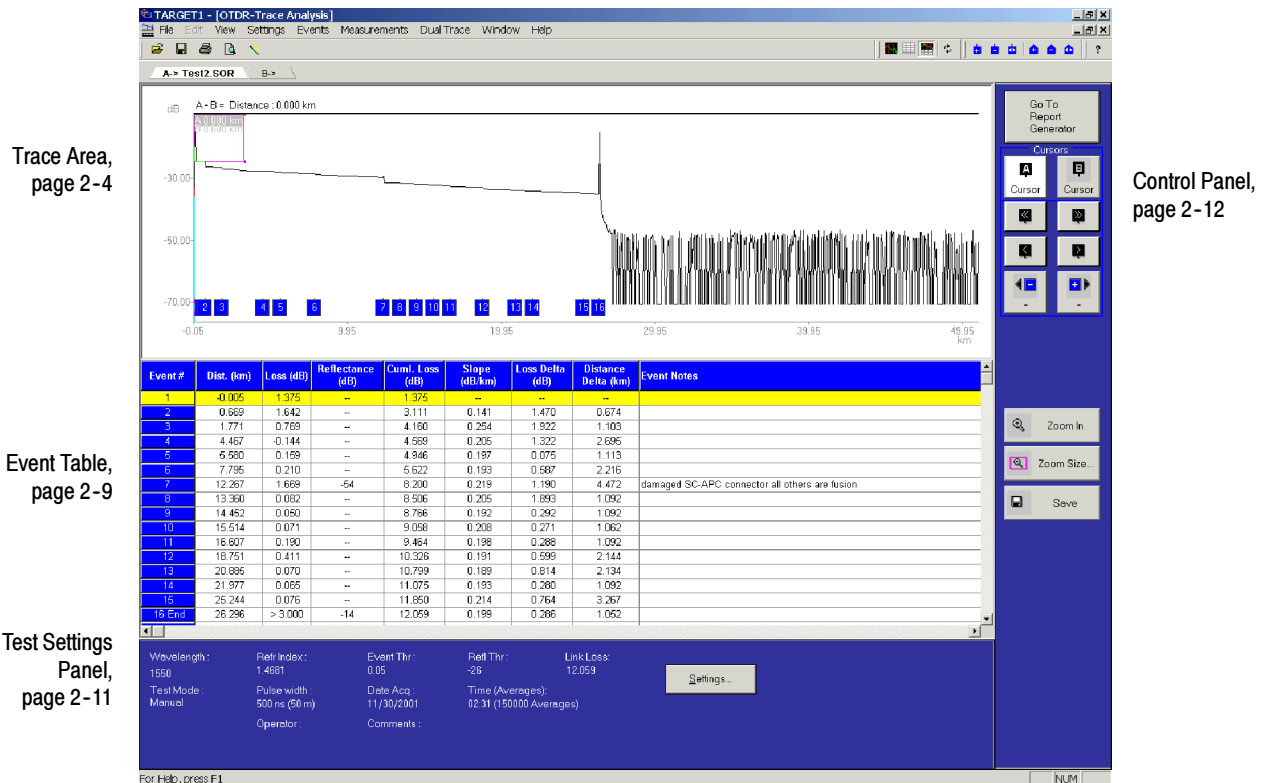





Figure 2-2: OTDR trace analysis display

View Options

You can select the following views using the **View** menu or the associated toolbar button:

- Maximize Trace.  This maximizes the trace area showing only the trace and one line of data for the selected event in the Event Table.
- Split Trace and Event Table.  This splits the display between the Trace area and the Event Table.
- Event Table Only.  This displays only the Event Table.

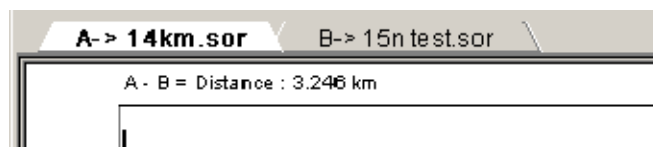
Trace Area

The trace area shows a graph of the acquired data points in the trace file. When a trace file is first opened, the initial trace is scaled to show the full trace of the acquisition.

The opening view depends on the View menu choice in effect when the application was last closed. Refer to *View Options* on page 2-4 for more information.

Figure 2-2 shows the Split Trace and Event Table view. The test settings panel is also shown.

There are two trace tabs: A and B. Use the tabs to switch between two open data files. The trace and the event table data change to show the information for the selected trace file.

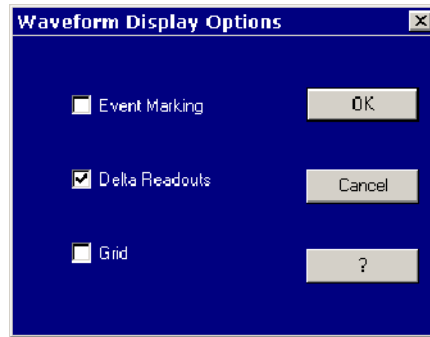



CAUTION. Make sure that you save changes to open data files before opening new files. If you open a file into a tab in which a data file is already opened, you will lose any unsaved changes in the open file.

To open two files into the TARGET1 application, select an empty tab in the Open dialog box. The Open dialog box default is the A trace tab.

Changing Trace Display Options

Select **View > Trace Display Options...** and then choose the options you want displayed:



- Choose **Event Marking** to display event markers () at the bottom of the trace area. Events are points in the acquisition at which measurement thresholds are exceeded and are sequentially numbered from left to right.
- Choose **Delta Readouts** to show the difference in position between cursors A and B. The difference readout is always a positive number.
- Choose **Grid** to display gridlines in the trace area.

Cursors

There are two vertical or distance cursors used in the trace area: A and B. Use the cursors to select points of interest (events) in the trace for making measurements. Use the A and B cursor select buttons in the control panel to make a cursor active. The button for the active cursor is highlighted. The active cursor in the trace is shown horizontally centered in the Zoom box (see Zoom Box on page 2-7).

Selecting a Cursor. In the control panel (to the right of the trace area), click the button for the cursor you want to make active: A or B. The button for the active cursor is highlighted. You can activate the inactive cursor by clicking the button that is not highlighted.

Positioning the Cursors. There are several methods available for positioning a cursor in the trace:

- Move the active cursor in large increments using the << or >> buttons in the control panel. This is the same as pressing the Ctrl-Left arrow or Ctrl-Right arrow key on your keyboard.
- Move the active cursor in small increments using the < or > buttons in the control panel. This is the same as using the Left arrow or Right arrow key on your keyboard.

- Move the active cursor using the previous (-) or next (+) buttons in the control panel. Each click moves the active cursor to the previous or next event in the trace. The event number the cursor will move to is indicated in the push button box. The active cursor returns to the first event after passing the last event in the trace.
- Click an event number in the trace display to move the cursor to that event.
- Click and drag a cursor to any position of interest in the trace.
- With the mouse, point to a position in the trace that you want to move the active cursor to, and then double click. The active cursor moves to that position in the trace.
- Select an event in the Event Table. The active cursor will move to that event.

Cursor Measurements. The cursor readouts in the OTDR emulation provide both the difference in distance from Cursor A to Cursor B and the distance from the beginning of the trace to the active cursor (either A or B) position. These values are shown just above the cursors and are updated as the cursors are moved within the trace area.

Event and Landmark Markers

Figure 2-3 shows event markers (square numbered boxes) across the bottom of the trace indicating events that were found when the measurement was made or were added by the operator. Small house-shaped markers indicate landmarks that are added to the trace by the operator to record physical features.

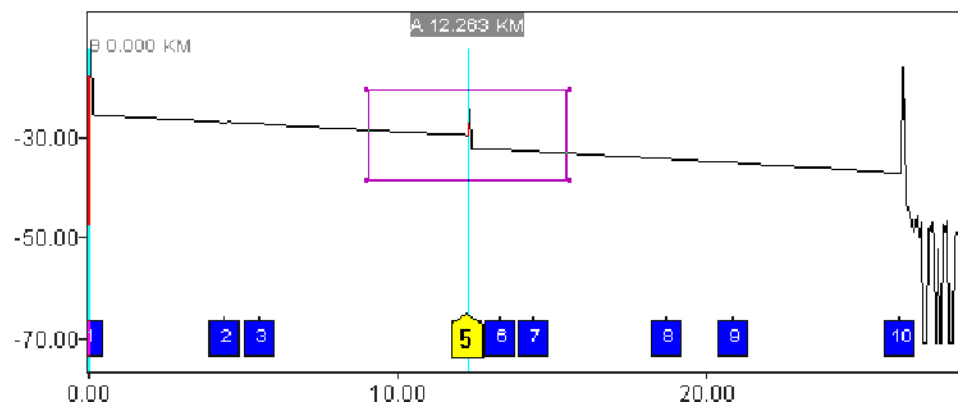


Figure 2-3: Event and landmark indicators on the OTDR trace

Zooming Use the pink Zoom box to display a selected portion of the trace. The zoom box displayed in the full trace defines the area of the trace that will be shown in the expanded (zoomed) trace (see Figure 2-4). Grab one of the corners of the zoom box with the mouse and drag the size to set the trace expansion area around the active cursor.

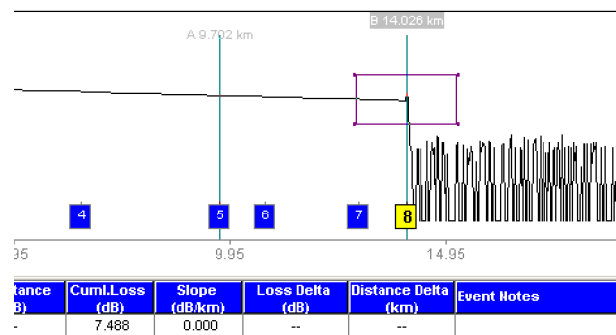
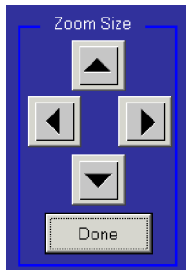
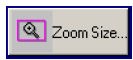


Figure 2-4: Trace with zoom box

In the control panel, click **Zoom In** to display the selected portion of the graph expanded in the trace area. The push button name changes to **Zoom Out**. Click **Zoom Out** to switch back to the full trace display.

The zoom box follows the active cursor. When zoomed in, use the cursor arrows on the control panel to adjust the portion of the expanded trace that is displayed in the zoomed trace. If you move the active cursor out of the expanded trace with the event selection buttons or make the inactive cursor active, the position of the zoom box is adjusted to again center the trace around the active cursor.

Use **View > Join Cursors** to bring the inactive cursor into the window when in zoom.



Press the **Zoom In** button to expand the trace to the size of the zoom box you defined. (The button label changes to **Zoom Out** when you are displaying a zoomed-in trace.)

You can also change the size of the expansion area by clicking the **Zoom Size** button to display the zoom size controls shown below.

While displaying a trace, use the left, right, up, and down arrows to adjust the size of the zoom box for the active cursor:

- Click the left arrow to make the zoom box narrower.
- Click the right arrow to make the zoom box wider.
- Click the up arrow to make the zoom box taller.
- Click the down arrow to make the zoom box shorter.

After you have set the zoom box size, press the **Done** button to exit the zoom size controls.

When you zoom in the display to expand a portion of the trace, a small graphic display, the Overview window, is shown at the top of the trace area (see Figure 2-5). This window indicates the location of the cursors in the trace and the relative horizontal size and location of the pink zoom box within the trace.

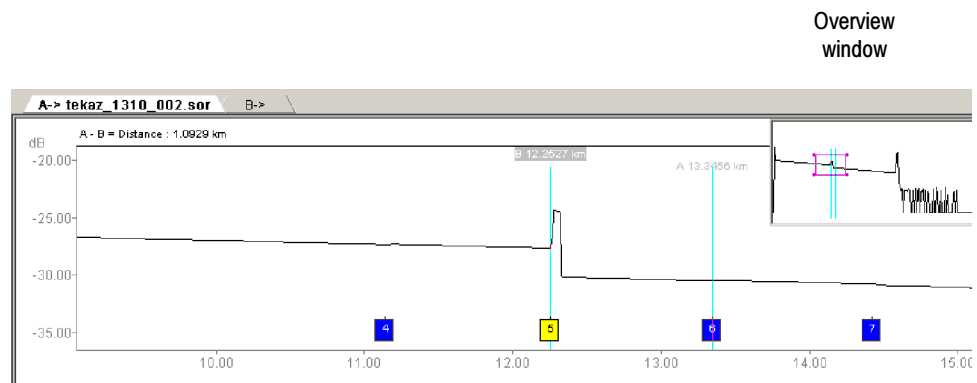


Figure 2-5: Zoomed trace with overview window

Event Table

Figure 2-6 shows the Event Table. The event table lists, in order by distance, those events in the trace file that violate the current event threshold. When the table contains more columns and rows than can be displayed in the space, use the horizontal scroll to view measurement columns and the vertical scroll to view all the events.

Event #	Dist. (km)	Loss (dB)	Reflectance (dB)	Cuml. Loss (dB)	Slope (dB/km)	Loss Delta (dB)	Distance Delta (km)	Event Notes
1	-0.005	1.375	--	1.375	--	--	--	
2	0.669	1.642	--	3.111	0.141	1.470	0.674	
3	1.771	0.769	--	4.160	0.254	1.922	1.103	
4	4.467	-0.144	--	4.569	0.205	1.322	2.696	
5	5.580	0.159	--	4.946	0.197	0.075	1.113	
6	7.795	0.210	--	5.622	0.193	0.587	2.216	
7	12.267	1.669	-54	8.200	0.219	1.190	4.472	damaged SC-APC connector all others are fusion
8	13.360	0.082	--	8.506	0.205	1.893	1.092	
9	14.452	0.050	--	8.756	0.192	0.292	1.092	
10	15.514	0.071	--	9.058	0.208	0.271	1.062	
11	16.607	0.190	--	9.464	0.198	0.288	1.092	
12	18.751	0.411	--	10.326	0.191	0.599	2.144	
13	20.885	0.070	--	10.799	0.189	0.814	2.134	
14	21.977	0.065	--	11.075	0.193	0.280	1.092	
15	25.244	0.076	--	11.850	0.214	0.764	3.267	
16 End	26.296	> 3.000	-14	12.059	0.199	0.286	1.052	

Figure 2-6: Event table

Refer to *View Options* on page 2-4 for information about how to allocate more or less screen space to the event table.

When the active cursor is on an event, the event readout in the table is highlighted. Click a line in the measurement table to move the active cursor to that event in the trace. Event data that exceeds the thresholds you set in the Test Settings and Limits dialog box (see *Changing Test Settings and Limits* on page 2-20) is highlighted in color.

When you add an event or landmark to a file, all the following events are renumbered. Landmarks are indicated with an “L” following the event number. Refer to the discussion beginning on page 2-28 for more details about adding, deleting, or moving event and landmark markers.

The event table contains measurement information for all marked events, including:

Table 2-1: Event Table column definitions

Column	Definition
Event#	Event numbers correspond to event markers or landmarks in the trace area.
Dist. (km)	Distance represents the distance from the front panel to the event or landmark.
Loss (dB)	Loss lists the loss of optical power at an event due to scattering, absorption, and bending.
Reflectance (dB)	Reflectance lists the ratio of reflected optical power to incident optical power for reflective events.
Cuml. Loss (dB)	Cumulative Loss lists the total loss from the front panel up to and including this event.
Slope (dB/km)	Slope lists the attenuation of the fiber between an event and the preceding event.
Loss Delta (dB)	Loss Delta lists the loss between an event and the preceding event.
Distance Delta (km)	Distance Delta lists the distance between an event and the preceding event.
Event Notes	Event Notes displays the Comments field of the Event / Landmark Notes dialog box.

The current event (the event where the active distance cursor is located) is highlighted in the event table. You can highlight another event by clicking anywhere on that event's row in the event table.

The distance, event loss, reflectance, and two-point distance measurements correspond to measurements on the trace display. This list shows some other relationships between different measurements:

- Loss Delta includes the event loss of the previous event and the loss between events.
- Slope is the loss per unit distance of the fiber between events, starting after the previous event and up to the current event.
- The overall link loss is the cumulative total of the Loss Delta measurements.
- Distance Delta measurements on the event table should correspond with those seen on the trace display, if the distance cursors are positioned precisely on the events in the trace display.

The event table is automatically compiled for all events that exceed a threshold (event loss or reflectance threshold). Measurements can also be entered manually into the table, if necessary.

NOTE. *Loss measurements on the event table may vary slightly from the same automatic measurements made in the trace display. For event-loss and reflectance measurements, measurements on the event table are made by fitting lines to the data between the current event and adjacent events (or in the case of IntelliTrace traces, to the nearest trace segment boundary), while measurements on the trace display use data within the expansion window.*

Refer to page 2-46 for information about editing the event table.

Test Settings Panel

The test settings panel (see Figure 2-7) provides basic information about the settings used to perform automatic measurements on the trace file. The fields are not editable from the panel.

To edit the settings, click the **Settings** button or select **Settings > Test Settings and Limits (File 1 or File 2)**. For more about test settings and limits, refer to page 2-20.

The Avgs/Time field displays the number of sampling acquisitions that were averaged before stopping the acquisition. The time that elapsed during averaging is also shown. This acquisition parameter is shown for information only and cannot be changed using the TARGET1 application.

You can edit the Operator and Comments fields by selecting **File > Fiber Notes**. Refer to *Adding Notes* on page 2-26.



Figure 2-7: Test settings panel

Control Panel

Use the control panel, shown in Figure 2-8, to display the Report Generator (see page 2-49), select and move the cursors (see page 2-5), jump to previous or next events (see page 2-5), zoom in on a trace element and size the zoom box (see page 2-7), or save changes to the trace file (see page 2-5).

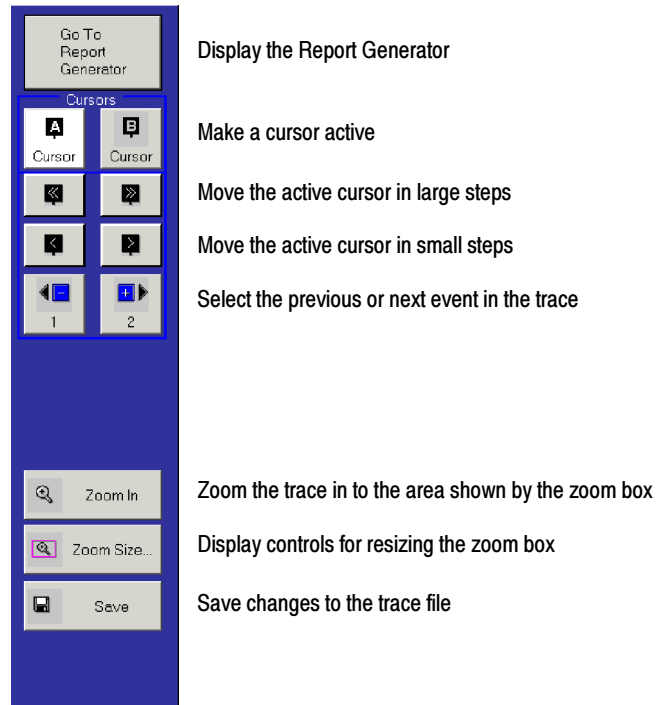


Figure 2- 8: Control panel

Menu Selection and Toolbar Button Descriptions

The menu bar choices provide the setup and operation selections you need to control the application. Click a task group title to get a drop down menu of all the controls and selections for a selected task. Selections followed by an ellipsis (...) display either a dialog box or further choices. If a menu choice is not available for the particular operating mode, the choice is grayed out and blocked from operating.

Table 2-2: TARGET1 menu selections









Menu / Selection	Toolbar button	Description
File		
Open		Open a new OTDR file. Displays the Open dialog box. See page 2-1.
Save		Saves changes to a previously saved file. For a new file, opens the Save As dialog box, allowing you to name and save the active file to a location you choose. Refer to page 2-19.
Save As		Opens the Save As dialog box, allowing you to name, choose a format, and save the active file to a location you select. Refer to page 2-19.
Export		Exports measurement data, notes, and test settings and limits to another file format (XML, HTML, CSV, or RTF). Displays the Export Data File dialog box. See <i>Exporting Data</i> on page 2-25.
Page Setup		Allows you to set paper type, page margins, page orientation, and other values for printed documents. See your Windows documentation.
Print Preview		Allows you to see how your measurement data will look when printed. See your Windows documentation.
Print		Displays the Print dialog box so you can print the active file. See <i>Printing Trace Analysis Views</i> on page 2-31.
Fiber Notes		Displays the Add Notes dialog box allowing you to add notes to the file. See page 2-26.
Report Wizard		Displays the Report Wizard which walks you through setting up a report in Report Generator mode. See page 2-56.
Recent OTDR Files		Allows you to open recently opened OTDR files.
Exit		Closes the TARGET1 application.
View		
Maximize Trace		Displays only the trace and one line of the event table showing the active event. Maximizes the trace.
Split Trace and Event Table		Displays both the trace and the event table.
Event Table Only		Displays the event table only. Maximizes the event table.
Test Settings Bar		Shows or hides the Setting panel (at the bottom of the application window). See page 2-11.

Table 2-2: TARGET1 menu selections (cont.)







Menu / Selection	Toolbar button	Description
Control Panel		Shows or hides the control panel (at the right of the application window). See page 2-12.
Zoom Scroll Bars		Allow you to move the trace left / right, up / down when the Trace view is zoomed in. Displays scroll bars at the bottom and left of the Trace view.
Trace Display Options		Displays the Waveform Display Option dialog box allowing you to show or hide event markers, delta readouts, or gridlines. See page 2-5.
Toolbars		
Reset All Toolbars		Returns all toolbars to factory default settings.
Customize Toolbars		Displays the Customize Toolbars dialog box allowing you to show or hide toolbars. See page 2-17.
Join Cursors		Moves the inactive cursor to the active cursor position.
Refresh		Updates the trace and event table for the current view.
Restore Zoom Box		Returns the zoom box to its original setting.
Display Overview Window		Determines whether or not the Overview window is displayed when Zoom In is selected.
Settings		
Test Settings and Limits		Displays the Settings and Limits dialog box allowing you to read, save, open, or modify measurement settings and limits. See page 2-19.
About Trace		Displays the About Trace(s) message box providing information about the active trace file(s). See page 2-18.
Open Settings		Displays the Open dialog box with the Settings and Limits tab selected allowing you to open a new settings file. See page 2-19.
Save Settings		Displays the Save As dialog box allowing you to save the current settings to a new file and location. See page 2-25.
Distance Units		Displays a submenu allowing you to set the distance units for the trace display. See page 2-19.
System Factory Defaults		Resets all settings to factory defaults.
Events		
Add Events		Displays the Add Event dialog box allowing you to add an event to the active trace file. See page 2-28.
Delete Events		Displays the Delete Event dialog box allowing you to delete an event from the active trace file. See page 2-28.
Move Events		Displays the Move Event dialog box allowing you to move an event in the active trace file. See page 2-28.
Add Landmarks		Displays the Add Landmark dialog box allowing you to add a landmark to the active trace file. See page 2-30.

Table 2-2: TARGET1 menu selections (cont.)













Menu / Selection	Toolbar button	Description
Delete Landmarks		Displays the Delete Landmark dialog box allowing you to delete a landmark from the active trace file. See page 2-30.
Move Landmarks		Displays the Move Landmark dialog box allowing you to move a landmark in the active trace file. See page 2-30.
Delete All Landmarks		Deletes, with your confirmation, all landmarks from the active trace file. See page 2-30.
Event/Landmark Notes		Displays the Event / Landmark Notes dialog box allowing you to record information and comments about a landmark in the active trace file. See page 2-26.
Freeze Events		Makes the current events a template for subsequently opened files. This means that all of the current events will continue to be displayed as other traces files are opened, regardless of the Event Loss actually found at those distances. Additional events that exceed the thresholds will also be found, displayed, and included in the event table. Consider freezing events if you are testing more than one fiber for which you expect the events to have the same locations.
Measurements		
Event Loss		Displays the Event Loss Measurement dialog box allowing you to perform event loss measurements (loss at a single point) on the active trace. The event loss results are displayed in the trace window. See page 2-33.
Two-Point		Displays the Two-Point dialog box allowing you to perform two-point measurements on the active trace. This measurement shows the loss between the left-most cursor position and the right-most cursor position. See page 2-37.
Reflectance		Displays the Reflectance Measurement dialog box allowing you to perform reflectance measurements on the active trace and to display measurement values in the trace window. See page 2-39.
ORL		Performs optical return loss measurements in the trace and displays the ORL value in the active trace. See page 2-42.
No Measurements		Select to remove all measurement cursors and displays from the active trace.
Bidirectional Averages		Displays the Bidirectional Averages dialog box allowing you to perform bidirectional average measurements between two trace files (representing measurements taken from each end of the fiber). See page 2-43.
Difference		Displays the Difference Measurement dialog box allowing you to perform difference measurements (the difference between one trace and another) and display the results in a third trace and event table view. See page 2-45.
No Third Tab		Removes the third tab showing difference or bidirectional average measurement results. Dual Trace mode remains active in the two traces.
Dual Trace		
Dual Trace On		Overlays one trace with a second trace. If a second trace file is not already opened, you will be prompted to open one. The newly opened trace file is displayed in the B-tab.

Table 2-2: TARGET1 menu selections (cont.)

Menu / Selection	Toolbar button	Description
Dual Trace Off		Removes the overlay image in open trace files. If a third tab is displayed for bidirectional average or difference measurements, this tab is removed and the Measurements menu selections revert to the default selections (No Measurements and No Third Tab).
Reset Vertical Separation		When in Dual trace mode, the zoom scroll bar only moves on the trace, allowing you to move the trace if it is overlaying the second trace. Reset vertical separation moves the trace back to its original location.
Window		
Cascade		Displays the Report Generator and Trace Analysis windows (if both are open) one on top of the other (the active window will be on top). See your Windows documentation.
Tile		Displays the Report Generator and Trace Analysis windows (if both are open) without overlaying one window on top of the other. See your Windows documentation.
Arrange Icons		Arranges icons representing minimized windows to the lower left of the application window. See your Windows documentation.
Open files list		Allows you to select the window you want to display from this area, which shows the open windows (maximum of two).
Help		
TARGET1 Help		Displays the TARGET1 online help with the Contents tab selected.
Contents and Index		Displays the TARGET1 online help with the Index tab selected.
About TARGET1		Displays copyright and version information for the TARGET1 application.

Customize Toolbars

Beneath the menu bar is a row of icons that provide quick selections for the tasks and setups. The icons in the tool bar can be tuned on or off in groups using the Customize Tool bars dialog box (see Figure 2-9). To access the dialog box, select **View > Toolbars > Customize Toolbars**. The default selection is for the File Options, View Options, Events and Landmarks, and Help icons to be visible in the icon tool bar. Tool icons are grayed out in the tool bar when their selection is not currently valid.

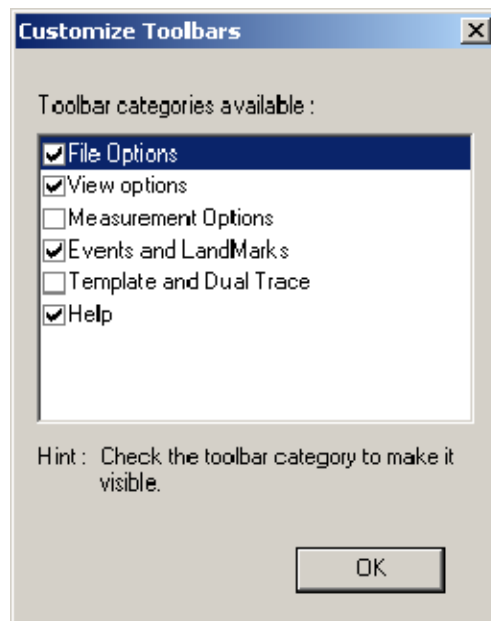


Figure 2-9: Customize toolbar selection window

Displaying Summary Information About the Trace File

Select **Settings > About Trace** to display summary information about the current trace file. The type of information displayed is shown in Figure 2-10. There are one or two columns; each represents an open trace file.

NOTE. The About Trace(s) dialog box displays the settings information that were used to acquire the original trace with the OTDR. The settings recorded here do not change if you change settings using the TARGET1 application, so you can use this dialog box as a reference.

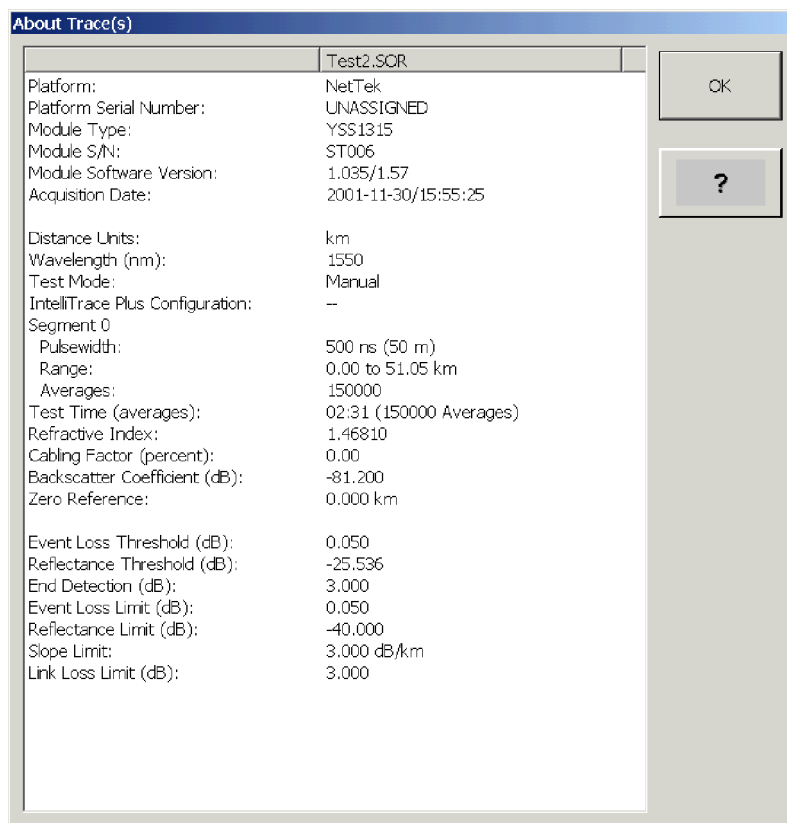


Figure 2- 10: About Trace(s) dialog box (shows original OTDR acquisition settings)

Opening a Test Settings File

Select **Settings > Open Settings > Trace 1** or **Trace 2** to select a file to open. The Open dialog box is displayed, showing the Settings and Limits Only tab. To open a test settings file, use standard Windows techniques to locate and open a file.

Once you click **OK** and return to the Trace Analysis views, the settings and limits of the newly opened test settings and limits file are applied to the active trace file, or to subsequent files that you open. Events in the trace file within the limits of the new test settings and limits file are removed from the trace and event table. Conversely, if an event exceeds the limits in the newly opened test settings and limits file, a new event is added to the trace and event table.

Searching for Trace Files

After selecting **File > Open**, you can use the **Search** button to set up a file search. The search choices for one-way files are:

- Search for a file name
- Search on a date acquired or modified
- Search on a file parameter

Click a selection tab (Name Locator, Date Modified, or Parameters) to select a set up window for defining the search criteria. Each of these search methods has option settings for defining the search. Refer to *File Search*, beginning on page 2-63, in the *Report Generator* operating information for details on file searching procedures.

Saving a Trace File

After entering manually adjusted measurements into an event table, you should save any changes you make into a different file using the Save As dialog box (**File > Save As**). There may be occasions when you want to restore the original measurement values. The only way to do this is to reload the original trace file.

To save a trace file, including any changes you have made to the file since you opened it (for instance, added events or landmarks, or manual measurements), click the **Save** button on the control panel.

The trace file is saved into the existing file and directory. To save the trace data into a new file, select **Save As** from the File menu.

You can save to .SOR and .CFF formats. Some high resolution data may be lost when you save to .CFF format.

Changing Display Units

You can set the measurement units to kilometers (km), meters (m), kilofeet (kft), feet (ft) or miles. You change the display units in the **Settings > Distance Units** submenu. To change the display units:

1. Select **Distance Units** in the **Settings** menu.

2. Select the desired setting from the submenu.

Changing Test Settings and Limits

You can modify the current settings and limits. Refer to page 2-25 for information on saving a new test settings and limits file (*.set).

Changing settings. Once you save changes, the active trace file is evaluated with the new settings and limits. Events in the trace file less than the threshold in the new settings are hidden from the trace and event table. Conversely, if an event exceeds the thresholds in the newly opened test settings and limits file, the event mark is added to the trace and event table.

Use these steps to change settings:

1. Click the Settings button in the test settings panel or select **Settings > Test Settings and Limits**. The Test Settings and Limits dialog box is displayed (see Figure 2-11).

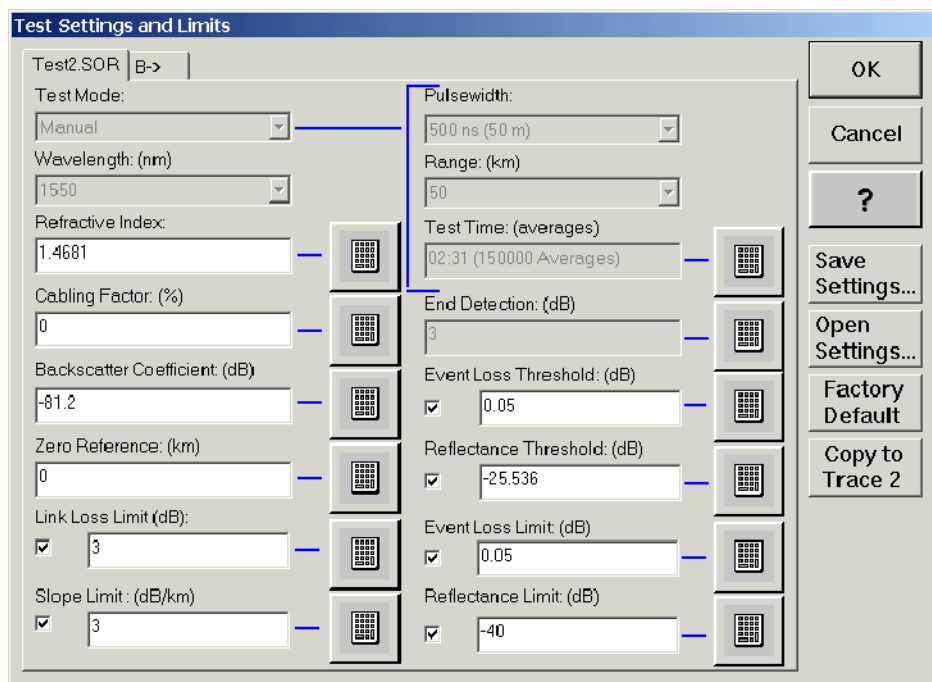



Figure 2- 11: Changing or displaying the current test settings and limits

The upper fields in the dialog box reflect aspects of the trace file that you cannot change, including the Test mode, Wavelength, IntelliTrace Plus Configuration, Pulse width, Range, Test Time (averages) and End Detection (dB). See the OTDR documentation for more information about these fields.



Some of the fields in this dialog box have a numeric keypad () to the right of the field. Clicking the keypad displays a dialog box allowing you to specify a new value. You can enter a value directly into the text field, or you can use the scroll bars above the text field to specify a new value. Only values between the numbers shown to the left and right of the scroll bars are accepted (an error message is displayed if you click OK and the number in the text field is out of range). Figure 2-12 shows the dialog box for the Refractive Index.

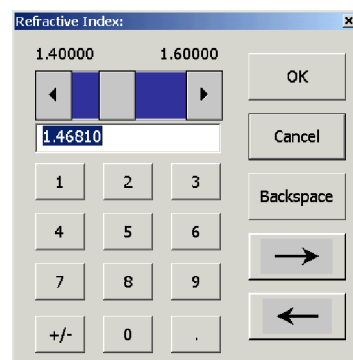


Figure 2-12: Refractive Index dialog box

2. To change the current test settings, click a numeric keypad or enter a new value directly into the text fields.

NOTE. If you click the *Factory Default* button, you will be asked to confirm that you want to change all values to factory defaults. The factory defaults apply only to the trace values and wavelength shown in the dialog.

Consider the following information when making your changes:

- **Refractive Index.** You can set the refractive index to any value from 1.4000 to 1.60000, inclusive. This value is a characteristic of the fiber, and can vary from fiber to fiber. The refractive index can be obtained from the fiber manufacturer.

The refractive index is a calibration factor for the distance (horizontal) scale. A change to the refractive index affects the distance scale and measurements. Distance measurements are rescaled as you change the refractive index.

If you do not know the refractive index of the fiber, you can calibrate the index if you know the distance to a feature on the fiber, such as a splice or the end of the fiber. To do this, place one of the distance cursors on the fiber

feature. Adjust the refractive index and press OK until the distance measurement at the cursor matches the known distance to the fiber feature. At this point, the refractive index is correct.

NOTE. This process to calibrate the index is for straight unbundled fiber. For fibers in bundles, installed fibers use the Cabling Factor setting to match distance to ground length.

If you do not know the refractive index for the fiber and cannot calibrate it, use the factory-default values, which are based on wavelength. See Table 2-3 for the default values.

Table 2-3: Default values for Refractive Index by wavelength

Wavelength	Mode	Default refractive index
850 nm	Multi	1.496
1300 nm	Multi	1.487
1310 nm	Single	1.4675
1550 nm	Single	1.4681
1625 nm	Single	1.4683

- **Cabling Factor.** In an optical fiber, the optical length can be longer than the external length of the cable due to spiraling in the cable bundle. The cabling factor is a percentage applied to the measured optical distance. It is used to derive the physical distance in the bundled cable so that the distances to events and landmarks can be determined accurately.
- **Backscatter Coefficient.** The backscatter coefficient is a characteristic of the fiber under test and, similar to the refractive index, can vary from fiber to fiber. It is a negative number indicating the dB level of the backscattered light relative to the light entering the fiber. Set the backscatter coefficient to any value from -100 to -40 dB, inclusive. Be sure the backscatter coefficient is set correctly before doing ORL or reflectance measurements.

The backscatter coefficient for a particular fiber can usually be obtained from the fiber manufacturer. If you do not know the backscatter coefficient, however, you should use the factory-default values, which depend on wavelength. Refer to Table 2-4.

Table 2-4: Default values for Backscatter by wavelength

Wavelength	Mode	Core diameter	Default backscatter
850 nm	Multi	62.5 μm	-62.8 dB
1300 nm	Multi	62.5 μm	-70.07 dB
1310 nm	Single	9 μm	-78.7 dB
1550 nm	Single	9 μm	-81.2 dB
1625 nm	Single	9 μm	-81.5 dB

- **Zero Reference.** Sets the distance used as the zero or starting point in the trace. It is used to eliminate jumper cable lengths between the patch panels and the front panel of the NetTek Analyzer. Set the distance units in the drop-down selection box to the right in this dialog box.
- **Link Loss Limit.** Sets the limit (in dB) for the level at which the Link Loss readout below the event table is highlighted. When the Link Loss exceeds this setting, the readout will be highlighted in red. You can set the limit to any value from 0.1 to 50.00 dB.
- **Slope Limit.** Sets the limit (in dB) for slope values that are highlighted in the event table. Slope is the power loss per unit length. Excessive loss can be due to bends or splices. The threshold setting is a limit on the loss per unit length that might be considered acceptable for a normal fiber. Excess slope indicates losses above the normal losses in the fiber. For 850 nm, the Slope Limit can be set to 2.000 - 8.000 dB. For other wavelengths, the Slope limit can be set from 0.100 dB to 5.000 dB.
- **Event Loss Threshold.** Sets the threshold (in dB) for events that are marked when event marking is turned on. Only those events with splice-loss measurements that meet or exceed the threshold are included, both on the measurement screen and on the event table. You can set the event threshold to any value from 0.01 to 5.00 dB. To display all events regardless of loss value, set the event loss threshold to 0.01 dB.

NOTE. When you click OK, this new threshold is applied to the active trace file. Event and/or landmarks may appear or disappear from the trace area and event table depending on the whether the new event lies above or below the threshold.

- **Reflectance Threshold.** Controls which events are visible in the trace area and event table. Events with reflectance measurements that are equal to or greater than the threshold are displayed, even if the event threshold is not met. You can set the reflectance threshold between -65 and -14 dB.

NOTE. When you click *OK*, this new threshold is applied to the active trace file. Event and/or landmarks may appear or disappear from the trace area and event table depending on the whether the new event lies above or below the threshold.

- **Event Loss Limit.** Sets the limit (in dB) for values that are highlighted in the event table. Only those events that exceed the limit are highlighted (displayed with a red background) in the event table. Set the event loss limit to highlight events that need attention. The range for event loss is 0.010 dB to 5.000 dB. In bidirectional or difference mode, this setting will apply to the derivative measurement.
- **Reflectance Limit.** Sets the limit (in dB) for values that are highlighted in the event table. Events with measurements that equal or exceed the limit are highlighted (displayed with a red background) in the event table. You can set the reflectance limit to any value from -65 to -14 dB, in steps of 1 dB.

If you see the “*OOR*” symbol in your data, refer to *OOR (Out of Range) Symbol* on page 2-24.

3. From the options provided, choose how you want limit violations highlighted in the event table (if at all). You can select any, all, or none of these options. Use the numeric keypads to display dialog boxes that allow you to specify a limit for Event Loss, Reflectance, Slope, and Link Loss.

OOR (Out of Range) Symbol. If an event that exceeds the End of Fiber threshold is not located before the data becomes too noisy, the software will display “*OOR*” (Out of Range) next to the event number in the event table.

If an event that exceeds the End of Fiber threshold is not located before the data becomes too noisy, the software will display “*OOR*” (Out of Range) next to the event number in the event table. If you see *OOR* in your data, refer to your OTDR documentation for ways to increase the range; try acquiring the trace again using the techniques suggested.

If there is a large loss that is the end of the fiber but the software passes over it, you can decrease the End of Fiber Threshold to mark it. The End of Fiber threshold may not mark the end of the fiber if the backscatter is too close to the noise level. This happens sometimes when the pulse width is short or the fiber is short.

If you want a specific event marked as the end, proceed as follows:

1. Move the cursor to the event you want marked as “*End*”.
2. Select **Measurement > Event Loss > Advanced Controls** button.
3. Manually adjust the event loss so that it is higher than the End of Fiber threshold. Refer to the *Event Loss Measurements* discussion beginning on page 2-33 for information on how to make the adjustments.

4. Click the **Update Table** button.

Saving Current Settings and Limits

To save the test settings and limits from the active trace file into a new test settings and limits file (*.set file), click the **Settings** button in the test settings panel, and then click the **Save Settings** button in the Settings and Limits dialog box. The **Save As** dialog box is displayed, with the Settings and Limits Only tab selected. Use standard Windows techniques to specify a drive, directory, and file name for the test settings.

Exporting Data

You can export acquisition data in the following formats:

- HTML for output to the Web
- XML for output to the Web or for other automated processing
- CSV (Comma Separated Variable) for output to a spreadsheet application
- RTF for output to a text editor
- XY for output to a spreadsheet application

Use these steps to export data:

1. Select **File > Export**.
2. In the Export Data File dialog box (shown in Figure 2-13), navigate to the drive and directory in which you will save the new file.

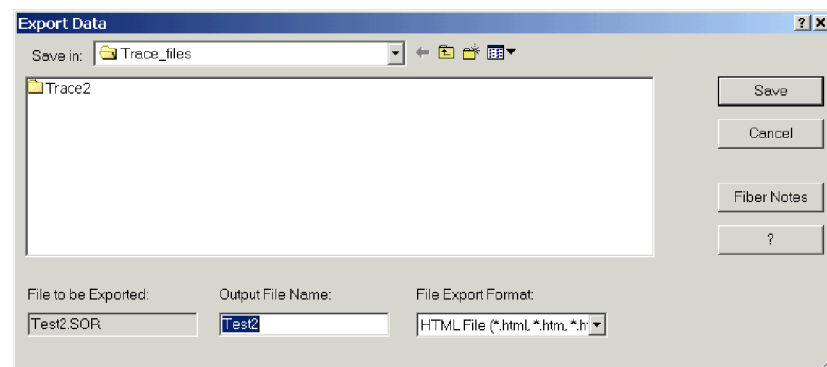


Figure 2-13: Export Data File dialog box

The **File to be Exported** text box contains the name of the open file to be exported.

3. Enter a name in the **Output File Name** text box. This field defaults to the same name as the data file.
4. Choose the format of the exported file from the **File Export Format** drop-down list box.
5. Click the **Fiber Notes** button to display the Fiber Notes dialog box, which lets you enter information about the trace file you are exporting. (See *Adding Notes* on page 2-26.)
6. Click **Save**.

Adding Notes

You can add different types of notes to a trace file. Fiber notes describe the characteristics of the fiber and measurement site. Fiber notes are displayed in trace summaries and reports. Event notes describe characteristics of specific events or landmarks. Use the procedures below to add information to your trace files.

To save any changes you make to either the fiber notes or event/landmark notes, you must save the trace file.

Adding fiber notes. To add fiber notes to a trace file, select **Fiber Notes** from the File menu. The Fiber Notes dialog box is displayed showing the notes (if any) that were included with the file at the time the measurement was made. The new notes are saved with the trace file when the file is resaved.

Change or add information to the fiber note fields:

- **Cable ID.** Identification of the cable containing the fibers being tested.
- **Fiber ID.** Identification of the tested fiber.
- **Cable Code.** Telcordia Suggested Optical Cable Code.
- **Operator.** The name of the operator making the original test, or the name of the operator who last saved the trace file.
- **Start Location.** A description of the start location for the trace.
- **Stop Location.** A description of the stop location of the trace.
- **Data Flag.** For data flags, the following codes are recommended:
 - BC - as-built condition
 - RC - as-repaired condition
 - OT - other (describe the condition in the Comments field)

- **Comments.** Use the comments field to note cable or fiber design or link issues; for instance, describe how the link is used or record any construction or repair issues.

NOTE. *Some of these fields may not be supported in file formats other than .SOR. In CFF files, the unsupported fields will be saved as text notes.*

Adding event and landmark notes. To add event and landmark notes to a trace file, select **Events > Event/Landmark Notes**. The Event/Landmark Notes dialog box is displayed showing the notes (if any) that were included with the file at the time the measurement was made. For event notes, the only field in this dialog box that you can edit is the Comments field. You can edit all the fields for landmark notes. Landmarks are saved only in .SOR format.

Displaying Distance Markers

There are two distance cursors, A and B, in Trace Analysis mode.

Make distance measurements by positioning the two cursors anywhere in the trace area (refer to *Cursors* on page 2-5). The distance between the position of the A cursor and the B cursor is displayed at the top of the trace display area. You can set the measurement units to kilometers (km), meters (m), kilofeet (kft), feet (ft) or miles using the **Settings > Distance Units** submenu (refer to *Changing Display Units* on page 2-19). Kilofeet (kft) are thousands of feet.

Displaying Event Markers

Events indicate a change in fiber characteristics that exceeds a preset threshold. The OTDR or the operator can add events during testing. You can also add events and apply a template of events and landmarks to test files.

Displaying event markers in the trace area. To show or hide all event markers in the trace area, select **View > Trace Display Options**. In the Waveform Display Options dialog box, select or deselect the Event Markers option to show or hide all event markers. Refer to page 2-5 for more information about the trace display options.

Displaying event markers by changing the test settings. When you change the threshold values in the Test Settings and Limits dialog box, some of the events may disappear and new events may appear in both the event table and the trace area. Refer to *Changing Test Settings and Limits* on page 2-20.

Adding, Moving, and Deleting Events

Use the steps described in this section to add, move, and delete events from the active trace file.

NOTE. When adding, moving, or deleting events, if an event is already selected or the active cursor is positioned where you want it, you can select *Add, Move, or Delete Events* from the *Events* menu, and then click the *Add, Move, or Delete Event* button in the dialog box that is displayed.

Adding events. Use these steps to manually add an event:

1. Place the active cursor where you would like to add an event. You can zoom in to better see the location.
2. Select **Add Events** from the **Events** menu.
3. You can adjust the cursor location using the controls in the Add Event dialog box (see Figure 2-14). The position showing in the Location text area is the location of the active cursor.

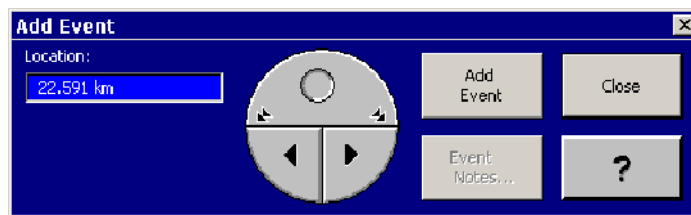





Figure 2- 14: Add Event dialog box controls

- Click and drag this icon, , to move the cursor smoothly and quickly left and right in the trace area.
 - Click these icons, , to move the cursor in large increments left and right across the trace area.
 - Click these icons, , to move the cursor in small increments left and right across the trace area.
4. After you have positioned the cursor where you want to add an event, click **Add Event**.
 5. Add an event note if needed, and then click **Close**.

If the cursor is on an area of the trace that lies below the current event threshold, you will see a message box saying the event will not be displayed. And when

you acknowledge the message, the event that was showing in the event table is removed.

After successfully adding an event to the trace area and event table, existing events are renumbered from left to right, and the added event appears in the event table with an asterisk, indicating that the event was manually added.

After adding an event, when you save a trace file and reopen it, the added event is displayed, provided the file is opened with the same test settings and limits.

Moving events. Use these steps to move events from one position to another in the trace file.

1. In the trace area or the event table, select an event to move.
2. Select **Move Events** from the **Events** menu. The **Move Events** dialog box is displayed with the selected event showing in the **Location** text box. See Figure 2-15.

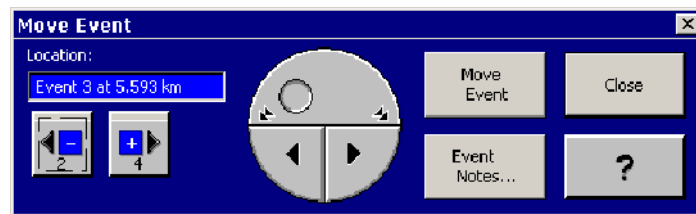



Figure 2-15: Move Event dialog box controls

NOTE. As you move the cursor, the location in the Location text box updates, but the event number you chose before you started moving the cursor remains the same. This indicates which event is being moved, and where it is being moved to, in the trace file.

3. Use the Move Event dialog box controls to move the event right or left to a new location in the trace area. You can also type in a new location (distance) for the event and click **Move Event** to move an event to another location.
4. Click the previous or next button  to move the active cursor to the previous or next event. Once you move the active cursor with these controls and select a new event, the new event will be the event marker moved.
5. After you have positioned the cursor where you want to move the event, click **Move Event**.

6. Add an event note if needed, and then click **Close**.

After successfully moving an event to the trace area and event table, event numbers are automatically updated in the trace area and event table.

Deleting events. To delete an event:

1. Select an event in the trace area or the event table that you want to remove from the trace file.
2. Select **Delete Events** from the **Events** menu.
3. In the Delete Events dialog box, click **Delete Event**, and then close the dialog box by clicking **Close**.

After an event is deleted from the trace area and event table, existing events are renumbered.

Adding, Moving, and Deleting Landmarks

You can use landmarks to help you remember how the trace relates to real locations on the fiber such as a bridge. You can mark places where a failure might occur in the future. Use the following steps to add, move, and delete landmarks.

Adding landmarks. To add a landmark in the trace:

1. Position the active cursor where you want to add a landmark. You can zoom in to better see the location.
2. Select **Events > Add Landmark**.
3. Use the cursor buttons to fine tune the position of the cursor. The location of the cursor appears in the Location text box.
4. Click **Add Landmark** to add a landmark at the location shown in the Location text box.
5. Click **Landmark Notes** to describe the landmark.

Moving landmarks. To move a landmark in the trace:

1. Select **Move Landmark** from the events menu or click the Move Landmark icon in the tool bar. Either selection displays the **Move Landmark** dialog window. The active distance cursor jumps to the nearest landmark in the trace.
2. The distance from the OTDR to the landmark number in the trace is shown in the **Move Landmark** window. If the selected landmark is the landmark

you want to move, use the position controls in the **Move Landmark** window to select the new position.

3. When you have set the new position, click the **Move Landmark** button.
4. The landmark is moved and renumbered as necessary.

Deleting landmarks. To delete a landmark from the trace and event table:

1. Select **Events > Delete Landmark** or click the Delete Landmark icon in the tool bar. The **Delete Landmark** dialog window appears. The active distance cursor jumps to the nearest landmark marker in the trace.
2. The distance from the OTDR to the landmark number in the trace is shown in the Landmark window. If the selected landmark is the landmark you want to remove, click the **Delete Landmark** button. The selected landmark is deleted, and the distance cursor jumps to the next nearest landmark in the trace (if present).
3. Use the - and + event position selection buttons to select the next landmark to delete. The events and landmarks that follow each deleted landmark are renumbered.
4. When finished deleting landmarks, click the **Close** button.

Deleting all landmarks. To remove all landmarks (and the notes associated with them) from the trace file, select **Events > Delete All Landmarks**.

Printing Trace Analysis Views

The Page Setup and Print Preview options are similar to most other Windows applications. The Print dialog box includes options described below that allow you to limit or include as much or as little information as you want.

Fields to Print. Choose which parts of the trace analysis view you want to print: Trace and Table, Trace, or Table.

Table Options. If you are printing the Event Table, choose whether to print all of the columns or only the first five. This option is not available if you are printing the Trace only.

Measurement Options. If you are printing a difference or bidirectional measurement, you can also choose to print either all of the event tables that went into making up the measurement or only the measurement event table (bidirectional measurement event table or the difference average event table).

Notes. Select this option to include the Fiber notes in the printed version of the trace data.

OTDR Trace Analysis Mode Measurements

The TARGET1 application emulates the operation of the NetTek Analyzer OTDR for the analysis of measurement data. Previously acquired and saved measurement data can be displayed and analyzed in much the same way that measurements are performed by the NetTek Analyzer OTDR.

You can make distance measurements by moving the cursors (see page 2-32) or choose one of the following measurements from the measurement menu.

These measurements are taken on one trace:

- **Event Loss:** Measures loss at a point on a fiber. See page 2-33.
- **Two-point:** Measures the loss, slope, and distance between two points on a fiber. See page 2-37.
- **Reflectance:** Measures the loss due to light reflected by a particular fiber feature, such as a connector or splice. See page 2-39.
- **ORL (Optical Return Loss):** Measures the reflected light from a section of fiber or from the whole fiber. See page 2-42.

These measurements are taken on two traces:

- **Bidirectional Averages:** Averages the events of two traces taken from opposite ends of the same fiber. Some events may appear differently depending on which end of the fiber you test. Use this measurement for a more accurate representation of the fiber than either trace alone can give. See page 2-43.
- **Difference:** Subtracts one trace from another. Use this measurement to compare two similar trace files. See page 2-45.

In addition to the automatic measurements performed by the TARGET1 application, you can manually adjust these measurements.

Distance Measurements

Make distance measurements by positioning a distance cursor at the point of interest. The distance from the front panel to the active distance cursor is displayed at the top of the cursor. The distance between the position of the A cursor and the B cursor is displayed at the top of the trace display area.

Refer to page 2-5 for information about positioning the cursors.

Event Loss Measurements

Event Loss measures the loss at a point on a fiber. Use it to measure the loss caused by a particular fiber feature such as a connector or splice. To measure event loss:

1. Place a cursor on the event or at a point of interest on the trace. Refer to page 2-5 for information about positioning the cursors.
2. Click the Event Loss icon on the measurement tool bar or select **Measurements > Event Loss**.

The Event Loss Measurement dialog box shown in Figure 2-16 appears. The event loss (or gain) is displayed in a cursor readout at the top of the trace area.

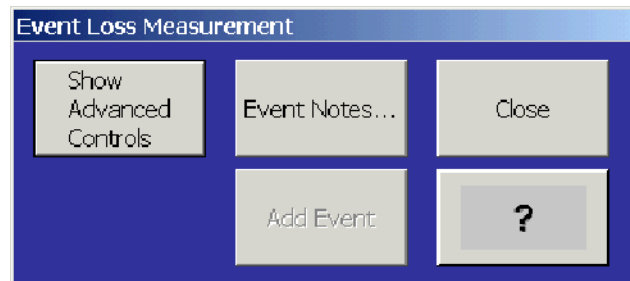


Figure 2-16: Event Loss Measurement dialog box

3. If you want to manually adjust the measurement, click **Show Advanced Controls** to access the cursor positioning controls. See Figure 2-17.

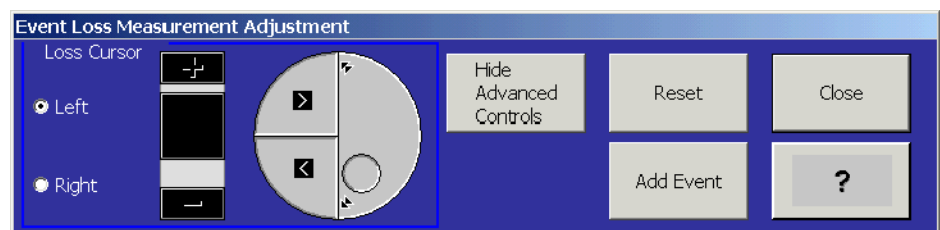


Figure 2-17: Advanced controls for Event Loss Measurement

For Event Loss measurements, there are two horizontal loss cursors, matched to the trace on either side of the active vertical cursor. The loss cursors remain attached to the vertical cursor and move horizontally as the vertical cursor is repositioned on the trace.

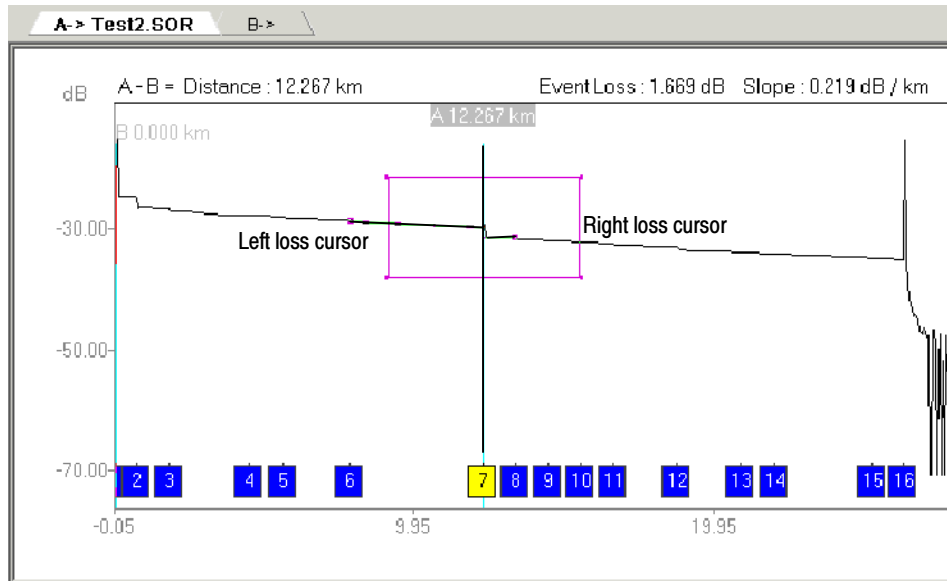


Figure 2- 18: Manual event loss cursor around active cursor

How Loss Cursors are Used

Measurements are calculated by fitting loss cursors to trace data points. The lengths of the loss cursors indicate the sections of the trace used in the measurement. The left and right loss cursors for the automatic event-loss measurement extend to the next event to the left and to the right of the vertical cursor position.

The loss cursors extend from the vertical cursor position either to the edges of the zoom window or the next event marker, if the event is in the zoomed area.

When making event-loss measurements, you can select the trace data used in the measurements by dragging the handle at the end of the loss cursors. You can include or exclude specific fiber features from your measurements this way.

Make manual adjustments to event-loss measurements by adjusting the slopes and vertical positions of the left and right loss cursors. Once the loss cursors are adjusted manually, they maintain the same slopes and vertical positions when you move the distance cursor.

Manual adjustments are retained until you click the **Reset** button in the Advanced Controls dialog box.

If you exit Event Loss mode after making manual adjustments, the loss cursor position adjustments are retained and displayed when you re-enter Event Loss mode. In this case, select the Event Loss Advanced controls again and click Reset to clear the user-adjusted measurements.

After making the measurement, you can update the table to reflect the measured value you obtained. Click the **Update Table** button in the Advanced Controls window to enter the new measurement value for the event. An asterisk precedes

the altered measurement to show that it has been changed from the original test data. To save new values to the event table, you must save the file. Use **File > Save** to write over the original file with the new data. If you want to keep the original data as well, use **File > Save As** to give the file you save a different name.

Positioning Loss Cursors

Refer to Figure 2-19 for information on using Advanced Controls to manually adjust loss cursors.

Manual adjustments you make to loss cursors are retained until you restart automatic measurements by clicking the **Reset** button. Then another automatic measurement is made using the current distance-cursor locations. The manual adjustments to the cursor are retained as long as the measurement is open. Switching to another measurement and then back again does not reset the cursor position. Close the measurement to reset the cursor to automatic the next time the measurement is started.

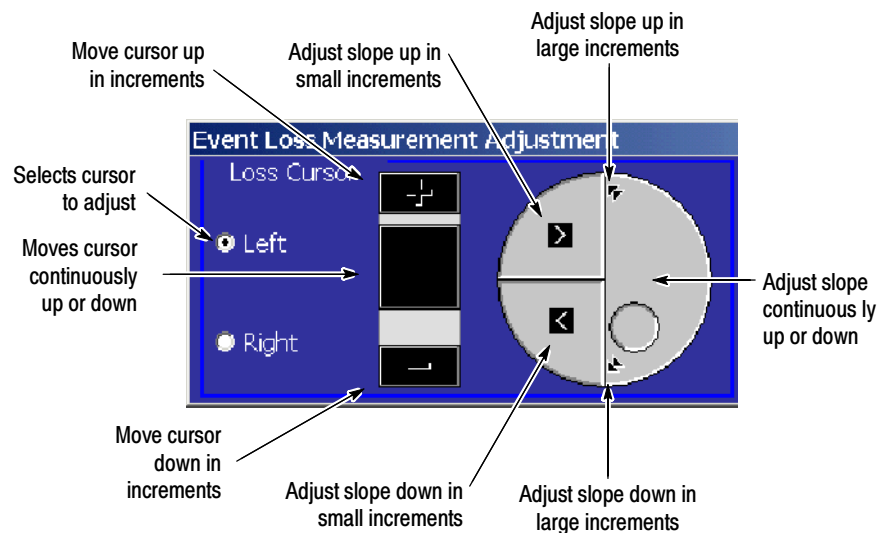


Figure 2-19: Loss cursor position controls

Moving the loss cursor. Grab the end of either loss cursor by positioning the mouse cursor on the end of the loss cursor and pressing and holding the left mouse button. Drag the end to rotate the cursor around the point where it touches the distance cursor. This allows you to match the loss cursor to the slope of the trace. It does not affect event-loss measurement values.

Elongating or Shortening the loss cursor. To elongate or shorten a loss cursor for easier matching to the trace slope, grab the end of the loss cursor with the mouse cursor and drag it along the trace.

Moving the loss cursors vertically. To move a loss cursor up and down, use the Advance Cursor controls or use the shift key and the mouse. You can position the cursor up and down to match it to the trace. The horizontal position of the loss cursor is not affected.

Two-Point Measurements

Two-point measurements measure the loss, slope, and distance between two points on a fiber. You can use Two-Point measurements to measure end-to-end distance and loss, for example. Click the Two Point button on the measurement tool bar or select **Measurements > Two-point**.

Look at the loss between two points on the trace:

1. Zoom in on the area of interest on the trace.
2. Select **Measurements > Two Point...**

The Two-point measurement controls shown in Figure 2-20 appear at the bottom of the screen.

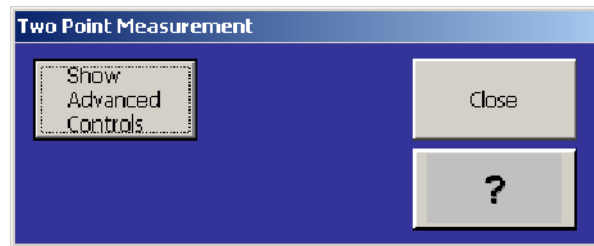


Figure 2-20: Two Point Measurement dialog box

3. Place a cursor to the left and right of the area of interest on the trace. Be sure both cursors are on backscatter regions of the trace. (Refer to page 2-5 for information about positioning the cursors.)
4. Look at the top line of the trace region for the readouts of distance, two point loss, and slope between the two cursors.

The distance from the front panel to the cursor is displayed at the top of the cursor. New two-point measurements are made at the new cursor positions. Continuous readout of the A-B distance, Two-point loss, and loss slope are provided as either cursor is positioned.

5. If you want to manually adjust the measurement, click **Show Advanced Controls** to access the cursor positioning controls and slope calculations choices. See Figure 2-21.

You can choose either of two types of slope calculations:

- **Two-Point Slope.** In two-point slope calculations, the two-point loss is divided by the two-point distance, using the data point at each intersection between the loss cursor and the trace. Select the two-point type of slope calculation for most two-point measurements.

- **LSA Slope** (least-squares average). In LSA slope calculations, the data points on the trace between the distance cursors are used to determine the best-fitting straight line using the least-squares average algorithm. Use the LSA slope calculation method for measuring fiber loss on featureless sections of backscatter.

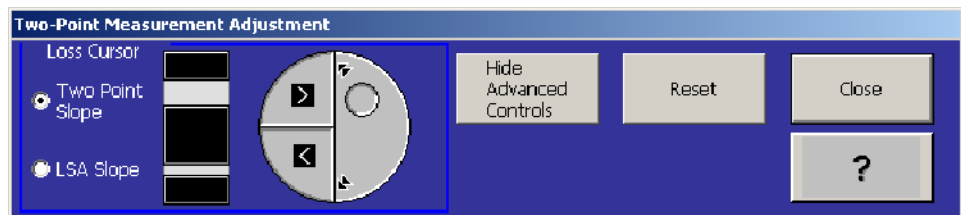


Figure 2-21: Two Point Measurement advanced controls

Two distance cursors and a single loss cursor define two-point measurements. You can move the distance cursors to make two-point measurements at various locations along the trace. New automatic two-point measurements are made at each new position of the distance cursors, if you have not made any manual measurements.

- **Loss cursor.** The loss cursor is located between the A and B distance cursors, positioned at the intersection of each distance cursor and the trace. The loss cursor moves horizontally as the distance cursors are moved, and moves vertically automatically with the slope of the trace.
- **Two-point distance.** The two-point distance is the distance between the distance cursors. The two-point loss is the difference between the decibel level of the trace at the right loss cursor and the decibel level at the left cursor, regardless of which distance cursor is active. The numeric loss and distance values are displayed in the cursor readouts across the top of the display area.

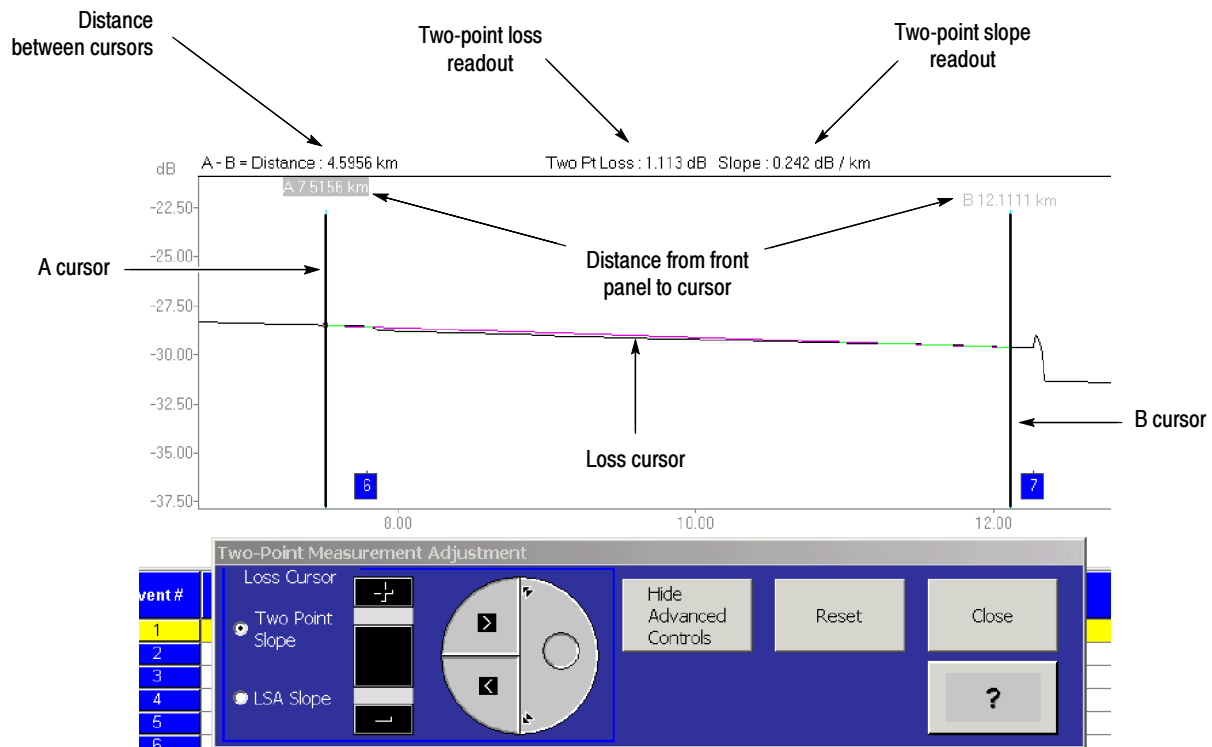


Figure 2-22: Two-point measurement display

Refer to *Positioning Loss Cursors* on page 2-35 for more information.

To manually adjust two-point measurements, adjust the slope and vertical position of the loss cursor using the Advanced Controls shown in Figure 2-19. Once the loss cursors are adjusted manually, they maintain the same two-point loss (or gain) when you move the distance cursors, and the amplitude of the point where the loss cursor intersects the distance cursor remains constant as the distance cursor moves. The loss per distance unit is recalculated at each new distance-cursor position.

Reflectance Measurements

NOTE. Before performing reflectance measurements, check that the backscatter coefficient in the Test Settings Tab is set to the correct value for the fiber being tested. Refer to Backscatter Coefficient on page 2-22.

Using reflectance measurements, you can measure the transmission loss due to reflectance at a point on a fiber, such as at a connector or splice.

To measure reflectance:

1. Place a cursor at the point of interest on the trace. The reflectance from that point appears as a readout at the top of the trace region.
2. Select **Measurement > Reflectance**.

The reflectance value is displayed at the top of the trace display area.

3. If you want to manually adjust the measurement, click **Show Advanced Controls** to access the cursor positioning controls. See Figure 2-23.

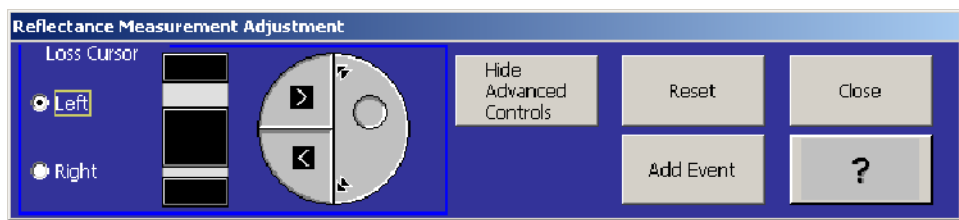


Figure 2-23: Reflectance measurement advanced controls

In Reflectance mode there are two loss cursors, matched to the trace on either side of the active distance cursor. Make manual adjustments to reflectance measurements by adjusting the slopes and vertical positions of the loss cursors. Refer to *Positioning Loss Cursors* on page 2-35 for more information.

4. Place the left loss cursor on the backscatter before the reflection being measured.

The left loss cursor is fitted to a segment of trace data to establish the backscatter level before the reflection being measured. This cursor extends from the distance cursor to the left edge of the expansion window when the trace is zoomed in.

5. Place the right loss cursor at the top of the reflection. See Figure 2-24.

The right loss cursor is used to mark the top of the reflection being measured, and extends slightly more than a pulse width to the right of the distance cursor.

On-screen Reflectance Loss measurements may vary from the Event Table on some traces. Table measurements use a more accurate area measurement for reflectance.

NOTE. TFP2/A FS Series modules include a masking capability. The masking setting used for acquisition is shown in the Mod Info field on the parameter tool bar. Reflectance measurements on a reflective event yield the most accurate results on a trace that was acquired with masking off; however, you can perform reflectance measurements on reflections that were masked using the AccuMask masking type. Reflectance measurements on reflections that were masked using the QuickMask masking type are not accurate.

Once the loss cursors are adjusted manually, they maintain the same slopes and vertical positions when you move the distance cursor, and reflectance is calculated at each new distance-cursor position.

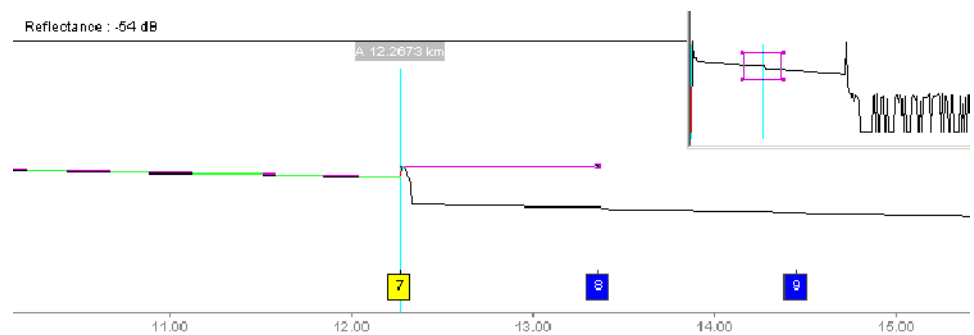


Figure 2-24: Manual Reflectance measurement

ORL Measurements

NOTE. Before performing ORL measurements, check that the backscatter coefficient in the Test Settings Tab is set to the correct value for the fiber being tested. Refer to Backscatter Coefficient on page 2-22. If a trace contains multiple fiber types, set the backscatter coefficient to the value for the fiber section under the left cursor.

Optical Return Loss measures the transmission energy reflected from a section of fiber or from the whole fiber. This measurement tells you the portion of the light entering from the left cursor that will be reflected back by the fiber and events between the cursors. ORL measurements are made on the fiber and events between the cursors.

1. Place the cursors to the left and right of the area of interest on the trace. Do not place the left cursor on an event; place it on a section of normal backscatter.
2. Select **Measurements > ORL**.

The ORL readout appears at the top of the trace region. See Figure 2-25. The ORL value is recalculated at each new section between cursors as you move a cursor. Move the distance cursors to exclude features from the ORL measurement, such as noise.

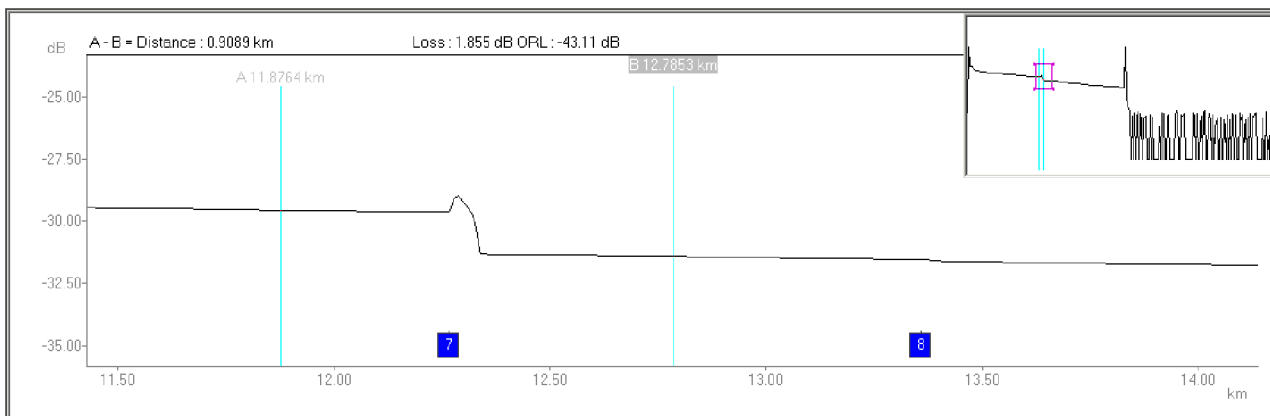


Figure 2- 25: ORL measurement

NOTE. TFP2/A FS Series optical modules have masking capability. For traces acquired using one of these modules, the masking setting that was used for acquisition is shown in the Mod Info field on the parameter tool bar.

ORL measurements yield the most accurate results on a trace that was acquired with masking off; however, you can perform ORL measurements on reflections that were masked using the AccuMask masking type. ORL measurements on reflections that were masked using the QuickMask masking type are not accurate.

Bidirectional Measurements

The bidirectional event-averaging feature allows you to use measurement files obtained from both ends of a fiber link, to average the event losses for each event on the link. To perform bidirectional event averaging on a fiber, you must have two trace files that represent the same fiber link, acquired from each end of the fiber. To average events on these traces together, follow these steps:

1. Open the first trace file into tab A, and the second trace file into tab B. (Refer to *Open a Trace File* on page 2-1.)
2. Select **Measurements > Bidirectional Averages**. This selection turns on dual trace (if it is not already on), displays a third tab called Averages, displays a mirror image of the second tab, and aligns the traces (see Figure 2-26). This view allows you to see the matching events on each trace, and makes it easier to check that each event has a matching event on the other trace.
3. Make sure the beginning and end of the fiber are marked with event markers on both traces and both are the same length. If they are not the same length, a length mismatch error message appears.
4. Remove any markers that appear past the end of either trace.

The bidirectional averaged event table contains each event on the fiber, the distance to the event as it appears on each trace, the event loss of the event as measured on each trace, and the average of the event losses.

OTDR Trace Analysis Mode

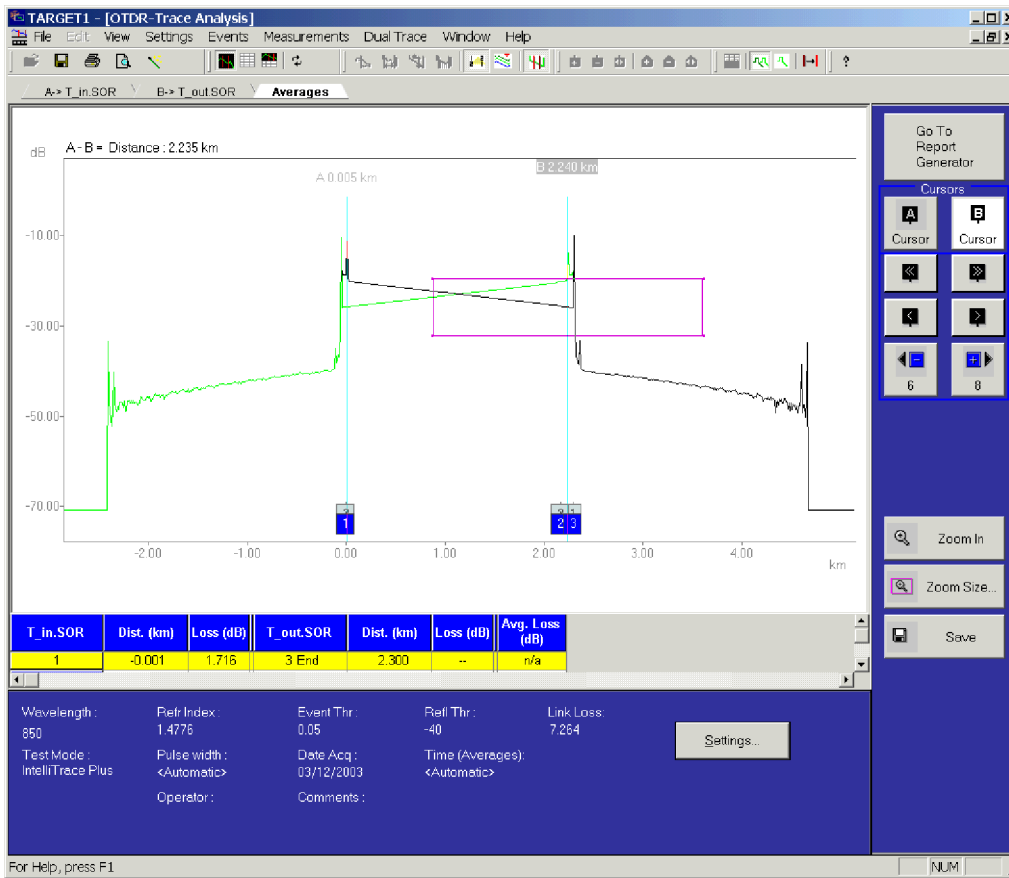


Figure 2-26: Bidirectional average trace display

Difference Measurements

Use this measurement to compare two similar trace files, such as traces taken on two fibers in the same cable, or traces from the same fiber taken at different times, to evaluate for changes over time.

The Difference function subtracts one trace from another and displays the results as a third trace. This measurement generates a third tab with a trace and event table that show the difference between the two trace files. The differences in the event loss values show you either the changes in the fiber between the acquisitions or the differences between two adjacent fibers.

You must have two files displayed to create difference data.

1. Open a trace file in tab A.
2. Open a second trace file in tab B.
3. Select **Measurement > Difference**. (If you have not opened a second trace file, a dialog box asks you to do so.)

Dual-trace mode is automatically turned on. The two traces and the difference trace are all displayed in the third tab.

The tabs above the trace region are labeled with the file name of the trace data. Select the tab of the trace data you want to be active. The event markers of the active trace are displayed in color; the event markers of the inactive trace are gray. The event table shows the events of the active trace data.

4. Select the third tab (Difference) to display the difference data in the Event table.

You cannot save the third tab as a file, but you can regenerate the data at any time from saved trace files.

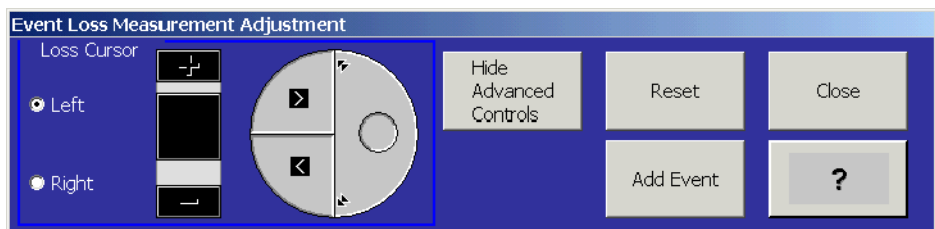
Select **Measurement > No Third Tab** or **Dual Trace > Dual Trace Off** to turn off the difference trace display.

Editing the Event Table

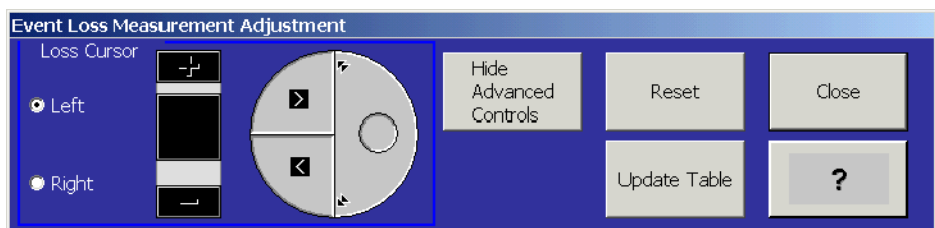
Measurements are made automatically at the locations of the event markers and entered into the event table. You can also make manually adjusted event-loss and reflectance measurements on the trace display and enter these into the event table, replacing the existing measurements.

To edit the event table:

1. On the trace display, move the distance cursor to an event marker by clicking that marker.
2. Make either an event-loss or a reflectance measurement (by selecting Event Loss or Reflectance from the Measurement menu).
3. You can adjust measurements manually. Adjust the zoom box and zoom in to better see the event area. Click the **Advanced Controls** button to manually adjust the left and right loss cursors using the controls shown below. Use Reset to go back to the automatic cursor settings.



If an event is selected, you can click the **Update Table** button, shown below, to update the event table with your manually adjusted loss data. See the online help for more information.



The event-marking fields below the trace display show the event-loss and reflectance measurements from the event table. The adjusted data is marked with an asterisk to indicate that it was entered manually.

NOTE. *For automatically placed event markers, if a new event-loss or reflectance measurement is below the current event-loss or reflectance threshold, the event is hidden from the trace display and from the event table.*

To save changes to the event table, you must save the trace file.

For information on editing event notes, refer to page 2-27.

After entering manually adjusted measurements into an event table, you should save any changes you make into a different file using the Save As dialog box. There may be occasions when you want to restore the original measurement values. To do this, reload the original trace file.

OTDR Report Generator Mode

The OTDR Report Generator provides a means of compiling the results of multiple fiber tests into a comprehensive report format. You can import and analyze certain file types from other manufacturers' optical test equipment. You can use the Report Wizard feature to step you through the process of generating reports.

Functional Overview

Figure 2-27 shows the main screen of the Report Generator with a report file open. This view is of both the trace and the table (View > Split Trace and Table). You can select View > Event Table Only to hide the trace, Report Summary, and Cable Information. This gives the maximum screen space for viewing the table.

Table 2-6 on page 2-53 lists the functions of each of the Report Generator menus.

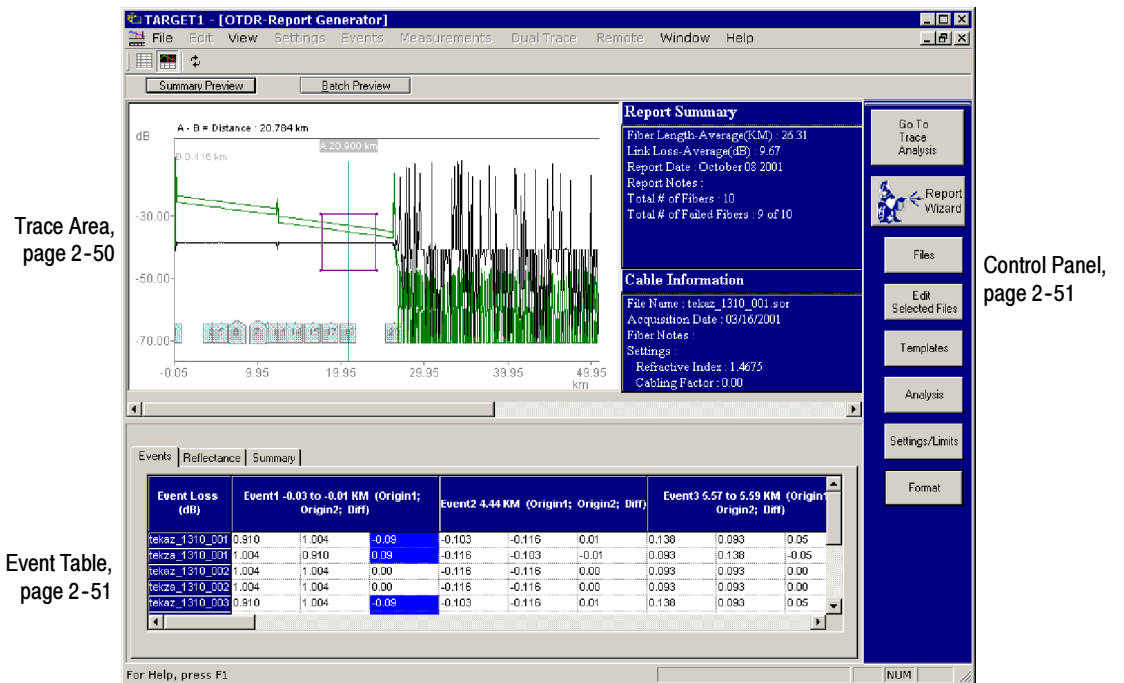


Figure 2-27: Report Generator display with both trace and event table showing

Trace Area The trace area is blank until either a report is compiled or a report file is opened, at which time the trace of the sample fiber file is displayed in an abbreviated display area.

When multiple fiber files are included in the report, select the trace that is displayed by clicking a file row in the table (see Figure 2-27). The display in the Cable Information area data updates to show that fiber file.

Report Summary	
Fiber Length-Average(KM) :	26.31
Link Loss-Average(dB) :	9.67
Report Date :	October 08 2001
Report Notes :	
Total # of Fibers :	10
Total # of Failed Fibers :	9 of 10

This information summarizes all the fiber data in the table.

Cable Information	
File Name :	tekaz_1310_001.sor
Acquisition Date :	03/16/2001
Fiber Notes :	
Settings :	
Refractive Index :	1.4675
Cabling Factor :	0.00

Cable information changes depending on the selected fiber in the table.

Figure 2-28: OTDR report summary and cable information boxes

Report Summary. Selected measurements for a compiled report are displayed to summarize the report findings. The default contents are the Fiber Length - Average, Link Loss - Average, and the Report Notes if any are in the file. Many additional measurement parameters can be added to the summary list (as shown in Figure 2-28) using the Report Summary selection in the Format choices. Use the vertical scroll bar that appears when you click inside a summary box to view the complete list when extra items are displayed. Refer to *Report Formats* beginning on page 2-74 for details on making the report summary selections.

Cable Information. The summary cable information for a compiled report provides identifying information on the file such as the filename, acquisition date, and fiber notes as a default. Additional selections that you can add to the Cable Summary include settings, two-point loss, two-point ORL, and two-point distance numbers. Use the vertical scroll bar to view the complete list when extra items are displayed. Refer to *Report Formats* beginning on page 2-74 for details on selecting the cable information.

Event Table

The event table provides a quick view of the events on the fiber. Each fiber file in the report is shown in the table as a single line. Select the information displayed for the events using the measurement tabs above the event table. Use the tab selections to display either event loss or reflectance for each event. A third tab provides a summary of the total loss and fiber length.

The three measurement tabs, Events, Reflectance, and Summary, are displayed by default; to change which tabs are displayed, use the Events Table. You can show all, any combination, or none of the measurement tabs in the Events Table. Refer to *Report Formats* beginning on page 2-74 for details on how to include or exclude these tabs from the report. The minimum event table display shows the event loss for each event in the trace.

Use the cursor placement and the right mouse button to display pop-up menus for additional functions. With the cursor on the file name, use the right mouse button to go to the Trace Analysis view of the file (Go to File). With the cursor on a column header, use the right mouse button to delete the column (Delete Column). With the cursor on any table cell, the right mouse button displays both pop-ups.

Events Tab. The Events tab provides a column for each event with the distance to the event shown in the table heading. The Event Loss for each event is displayed in the table cells.









Reflectance Tab. The Reflectance tab provides a column for each event with the distance to the event shown in the table heading. The Reflectance for each event is displayed in the table cells.

Summary Tab. The Summary tab provides a summary of the selected measurements on the fiber and the test wavelength. You can show all or none of the measurements in the Summary table. Refer to *Report Formats* beginning on page 2-74 for details on selecting the summary measurements.

Control Panel

The control panel buttons give you access to all the major functions of the report generator. The **Report Wizard** button walks you through all the functions. The buttons below the Report Wizard provide quick access to functions of the Report Wizard, allowing you to make changes without stepping through the Report Wizard. The **Go To Trace Analysis** button toggles to Trace Analysis mode. See the button descriptions in Table 2-5 on page 2-52.

Table 2-5: Report Generator control panel

Button	Description
	Returns to the Trace Analysis mode. See <i>OTDR Trace Analysis Mode</i> on page 2-1.
	Starts the Report Wizard, which asks you questions about the report content and finds files based on the answers you check. The Report Wizard guides you through the report generation process to produce a report file that can be saved and printed, or exported to third-party data processing applications. Refer to <i>Using the Report Wizard</i> beginning on page 2-56.
	Allows you to define the type of report you want to make: one-way or bidirectional, in either a batch output of individual OTDR traces or a fiber group summary report.
	Allows you to add files to or replace files in the list of files that will be included in the report.
	Allows you to use data from a sample file as a template for all the files in a report. You can add events, landmarks, and notes to all the files in the report.
	Allows you to select additional measurements: Auto 2-Point Loss and ORL. You can place the cursors at specific events or distances in the trace, and you can zoom in on specific portions of the trace.
	Allows you to assign common settings for all the traces in a report. This affects what events will appear. You can also assign common limits for all the traces in a report; this allows you to highlight out-of-limit data in the report event table.
	Allows you to select the elements that you want included in the report and set up the layout of the report. You can set up a title, headers, footers, and page numbering. Refer to <i>Report Formats</i> beginning on page 2-74.

Menu Selections Table 2-6 lists all the menus and their functions.

Table 2-6: TARGET1 Report Generator menu selections







Menu / Selection	Toolbar button	Description
File		
New...		Prompts you to save an unsaved report if appropriate. Opens a blank report.
Open...		Displays the Open dialog box, allowing you to open a saved report file.
Close...		Prompts you to save an unsaved report if appropriate. Closes an open report file.
Save		Saves changes to a previously saved file. For a new file, opens the Save As dialog box, allowing you to name and save the active file to a location you choose.
Save As...		Opens the Save As dialog box, allowing you to name, choose a format, and save the active file to a location you select.
Export...		Allows you to save the active report to another file format (XML, HTML, CSV, or RTF). See page 2-25 for details about the file formats you can use for exporting files.
Page Setup...		Allows you to set paper type, page margins, page orientation, and other values for printed documents. See your Windows documentation.
Print Preview		
Summary Preview		Displays a sample page of a summary report.
Batch Preview		Displays a sample page of a batch report.
Print...		Displays the Print dialog box so you can print the active file. See your Windows documentation.
Report Wizard...		Starts the Report Wizard, which walks you through creating a report. See page 2-56.
Report Notes...		Allows you to enter notes about the report. See page 2-55.
Report Date...		Allows you to enter a date for the report. See page 2-55.
Recent Report Files		Allows you to open a recently opened report file.
Exit		Closes the TARGET1 application.
View		
Split Trace and Event Table		Displays both the trace and the event table.
Event Table Only		Displays the event table only. The trace, report summary, and cable information are hidden.
Show Wizard Control Panel		Allows you to show or hide the control panel buttons.
Refresh		Updates the trace and event table for the current view.

Table 2-6: TARGET1 Report Generator menu selections (cont.)

Menu / Selection	Toolbar button	Description
Window		
Cascade		Displays the Report Generator and Trace Analysis windows (if both are open) one on top of the other (the active window will be on top). See your Windows documentation.
Tile		Displays the Report Generator and Trace Analysis windows (if both are open) without overlaying one window on top of the other. See your Windows documentation.
Arrange Icons		Arranges icons representing minimized windows to the lower left of the application window. See your Windows documentation.
Open files list		Shows the open windows (maximum of two). Select the window you want to display.
Help		
TARGET1 Help		Displays the TARGET1 online help with the Contents tab selected.
Report Wizard Help		Displays the TARGET1 Report Generator online help with the Contents tab selected.
Contents and Index		Displays the TARGET1 online help with the Index tab selected.
About TARGET1		Displays copyright and version information for the TARGET1 application.

Saving Reports

Select **File > Save** to save changes to a previously saved file, or select **File > Save As** to choose a name, format, and location for saving the active file.

You can save files in the following formats:

- Report File (*.rpt) saves the report with all the trace data.
- Report Format (*.rpf) saves pointers to the trace files used to create the report file. When reopened, the report is regenerated. You can use these files as a template to generate similar reports.
- Report and Data Files saves .rpt and .rpf to a directory along with the OTDR trace files in the report. This is the most robust way of saving files.

Exporting Report Files

Select **File > Export** to display a Save As dialog box that allows you to save the report data as XML, HTML, CSV, or RTF. See page 2-25 for details about the file formats you can use for exporting files.

Adding Report Notes and Date

After you have generated a report file, select **File > Report Notes** to record comments about the report. Click inside the report note window and type in the report note information.

To add a date to the report file, select **File > Report Date**. The default date is taken from the computer date-time. Click the down arrow in the Report date: window to display a calendar that you can use to select a different date for the report. See Figure 2-29. Use the Format dialog box to include the date in the Report Summary.

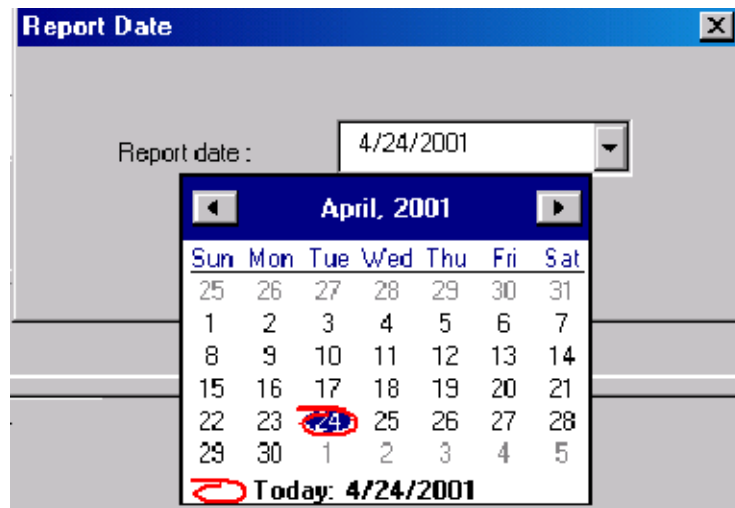


Figure 2-29: Report date selection calendar

Using the Report Wizard

The Report Wizard guides you through the complete setup procedure for creating a report. Based on the selections you check, the wizard accesses the files needed, analyzes the data in the files, and generates a report that gives the requested information for a set of fibers.

NOTE. *To create a report, you must fill in the first three dialog boxes of the Report Wizard to select files and the report type. Making changes to the other dialog boxes is optional; the default selections will give you a usable report.*

You can access any of the Report Wizard steps directly using the control panel selection buttons below the Report Wizard button. Each of the buttons goes directly to a setup dialog box. The direct access buttons are useful to modify the report after you have used the Report Wizard to make the initial selections.

In the Report Generator control panel, click the Report Wizard button to start the Report Wizard.

Files The Files dialog box, shown in Figure 2-30, is the first in the Report Wizard. You can also access it by clicking the File button.

1. You can select either or both types of report:
 - **Fiber Summary Report** is the default selection and creates a detailed report. Select this type of report to create a single table summarizing multiple traces.
 - **Batch Output Multi-page report** gives brief reports based on many files. Select this type of report to create similarly formatted tables, one for each trace (or one table for each pair of traces for bidirectional and difference measurements).

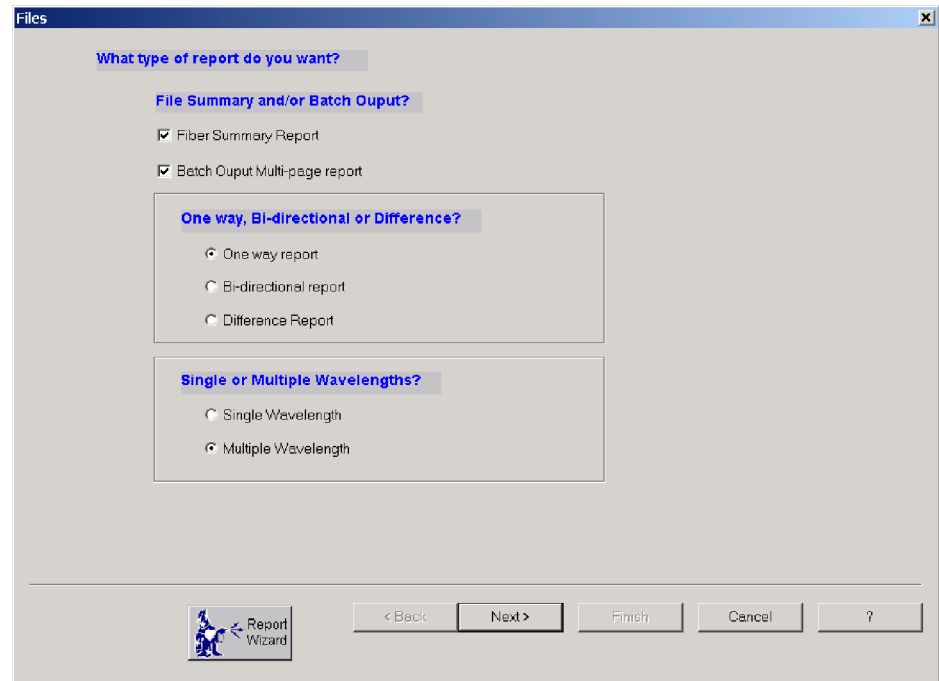


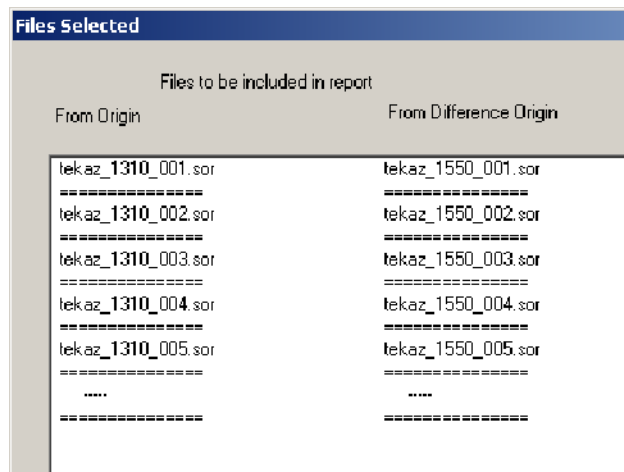
Figure 2-30: Report Wizard Files dialog box, part 1

2. Choose One Way, Bi-directional, or Difference report type. This option determines the selections available when you click Next. Descriptions for each report choice follows:
 - **One-way report** provides only one file selection. Select one-way reports when all the files that you want in your report are taken from the same end of the fiber.
 - **Bi-directional report** provides a second file selection, representing the Far End measurement file. Select Bi-directional report when there are measurement files taken from both ends of the fiber and you want to use bi-directional averaging. You will need to provide a sample file name for each direction in the bidirectional report.

Bi-directional characterization of the fiber (the same measurements taken from both ends of the fiber) can be used to cancel fiber mismatches, such as those caused by the joining of two fibers with different scattering coefficients. When the two files are compared with bidirectional averaging, the mismatch errors are cancelled.
 - **Difference report** provides a second file selection, representing the second file that was used to create difference average measurements.

3. Choose the **Single** or **Multiple Wavelength** report type depending on how many wavelengths were used to take traces. You can include up to three wavelengths for each trace in one report. If you have more than three wavelengths to make reports for, create additional reports.
 - Select **Single Wavelength** when all the traces were taken with the same wavelength.
 - Select **Multiple Wavelength** when all the traces were taken with more than one wavelength.

NOTE. For difference measurements for which you want to compare traces acquired with two wavelengths, it doesn't matter whether you choose *Single* or *Multiple*. In the second part of the Files dialog box, put the second wavelength files in the the column on the right. The third dialog box, Files Selected, should then look something like what is pictured below:



4. Click Next to go to the next part of the Files dialog box. See Figure 2-31.

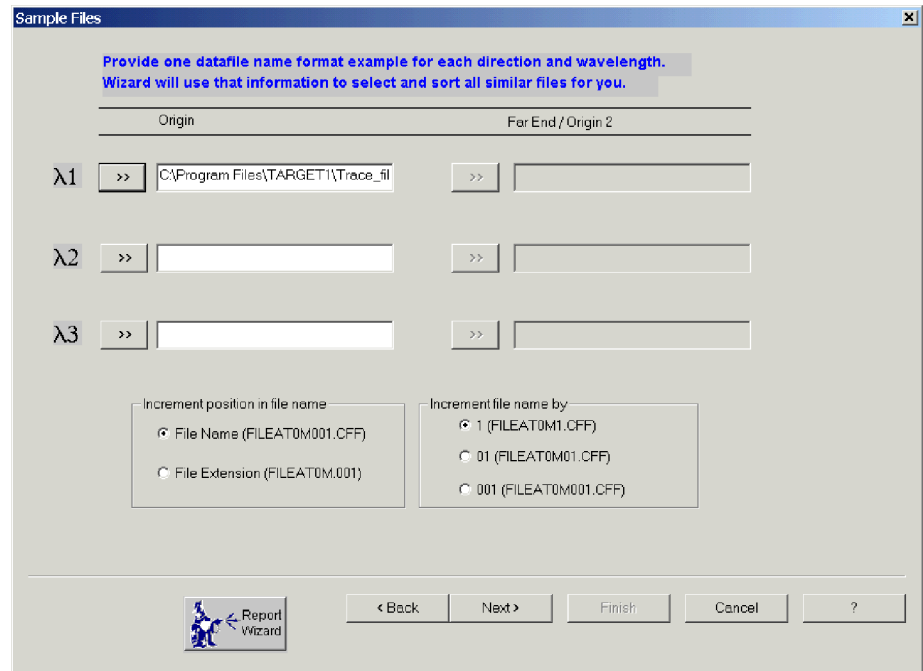


Figure 2-31: Report Wizard Files dialog box, part 2

5. Choose example files for up to three wavelengths that you want in your report.

You can use files from any accessible file directory. If the computer is connected to a network, any connected file system is accessible. Start your selection of files by clicking the >> button next to the $\lambda 1$ wavelength file name window. The **Select File** dialog box, shown in Figure 2-32, is displayed. Select the directory and locate the file or files you need for the report.

Refer to *File Search* on page 2-63 for more information about how to find files.

The Report Wizard needs examples of the type of files you want to include in the report. A good file naming convention is important. Provide an example file name of the matching files for each direction and each wavelength you have selected.

Fiber No.	Point of Origin File	Far End of Fiber File
1	AFIBER01.SOR	BFIBER01.SOR
2	AFIBER02.SOR	BFIBER02.SOR
	and so forth	

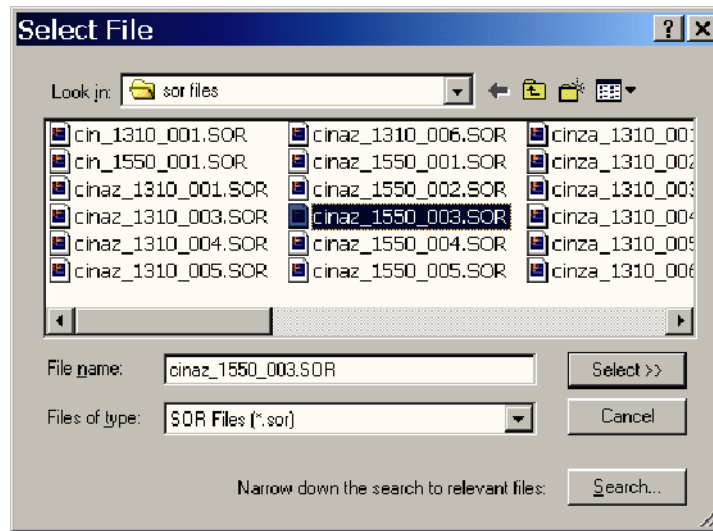


Figure 2-32: Select file navigation screen

6. Indicate what file extensions the Report Wizard should look for and how many digits are used in your file incrementing.

If there are multiple files, the Report Wizard matches the files to compare by a parameter of the file name, usually the number in the file name or the file extension. The file increment selections provide a guide as to how the filenames should be looked at for matches. For example, if the files are incremented in the name such as AtoB001.sor and AtoB002.sor, then the File Name selection is correct. If the files are incremented in the extension, for example AtoB1310.001 and AtoB1310.002, then the file extension choice is correct.

Use the selections in the box **Increment position in file name** to indicate whether the file number appears just before the file extension (FILEAT0M001.CFF) or as the file extension (FILEAT0M.CFF). Use the selections in the box **Increment file name by** to indicate whether your files are numbered with one digit (1), two digits (01), or three digits (001).

7. Click **Next** in the Files dialog box to view the list of files that the Report Generator finds based on the samples you identified. The Files Selected dialog box appears. See Figure 2-33.

The Report Wizard searches the file system for files that match the example file name(s) you provided and generates a Report File List. Using the examples you provide, the Report Wizard searches for all matching file types and generates a file list as shown in Figure 2-33.

Review the list to see if the correct files are listed for the report you want made. You can then accept, add, or remove files from the list as needed to

create the file list to use for the report. Click the file name and then **Remove** to remove a file. Click **Add Files...** to browse for a file name to add to the list.

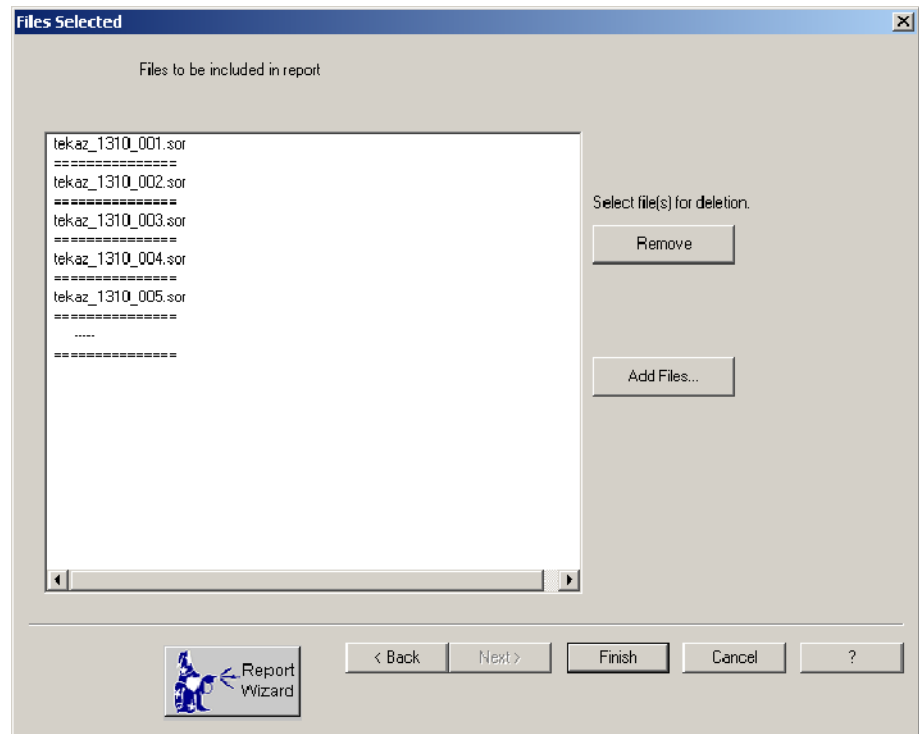


Figure 2-33: Report Wizard File Selected dialog box

When building a report file list, the position of the file name in the list has meaning. Files are listed in groups with all the trace files for one fiber together. Columns designate which end of the fiber the files are from (that is, their point of origin). If there is more than one row per group, then each row is a different wavelength. The number of file slots per group is based on the number of sample file names entered and their position.

TARGET1 analysis looks at relationships between the trace files for each fiber for critical measurements. Failure to group files as described above can lead to measurement errors.

For example, a bidirectional average report means that you have a file from each end of the fiber. The list will have two columns. If you test at two wavelengths, you will have two files from each end, one for each wavelength. So each fiber will have four test files. These are presented in a group like:

```
NearEnd-Wavelength1-Fiber001   FarEnd-Wavelength1-Fiber001
NearEnd-Wavelength2-Fiber001   FarEnd-Wavelength2-Fiber001
```

TARGET1 will leave a space for files not located. In the example above, let's say we were missing the Far End trace for Wavelength 1. The list would look like:

```
NearEnd-Wavelength1-Fiber001   -----
NearEnd-Wavelength2-Fiber001   FarEnd-Wavelength2-Fiber001
```

If you manually add the missing file you need to put it in the empty space. You can also replace one of the other traces, as long as the replacement is put in the right file position. At the end of the file list TARGET1 provides an empty file group:

```
-----
-----
```

This allows you to add a new fiber group and maintain the file relationship information. When you add a name to this empty group, a new blank group is added to the bottom of the list.

8. Click Next (or the Report Generator button and then Next) to proceed to the Template Options dialog box. Go to *Template Selection* on page 2-66.

File Search

Use the Search feature in the Select File dialog box to locate a file you want to use for the example. You can search by file name or partial name, search by a date or range of dates, or search by certain file parameters. Click the **Search** button to display the **Search File(s)** dialog box shown in Figure 2-34. Select a search type tab to display the search options for that parameter.

NOTE. *The search criteria are Boolean ANDs, so a search will only find files that match all the search criteria you enter. The search is case sensitive.*

Name Locator. If you know the specific file name you want, type it in the **Named:** box. If you know only the type of files you want to look for, use a wildcard with the file extension in the **Named:** box. For example, if you want to look at all the SOR files stored in the file system, type ***.sor**. You can also use partial file names with wildcard characters (***filename*.***).

Look in. Select a directory in the **Look in** box to specify one of the connected file systems to search. Click the down arrow in the box to show the connected drives that you can select. You can also use the Browse button to select a folder for the search. All the connected and accessible directories are displayed for making your selection.

Search by Date Modified. If you know the date or range of dates of the files you want to look at, search by **Date Modified**. Click the desired search parameter and fill in the values. You can search for files modified in a specific range of dates, within a selected number of months, or within a selected number of days. See Figure 2-35.

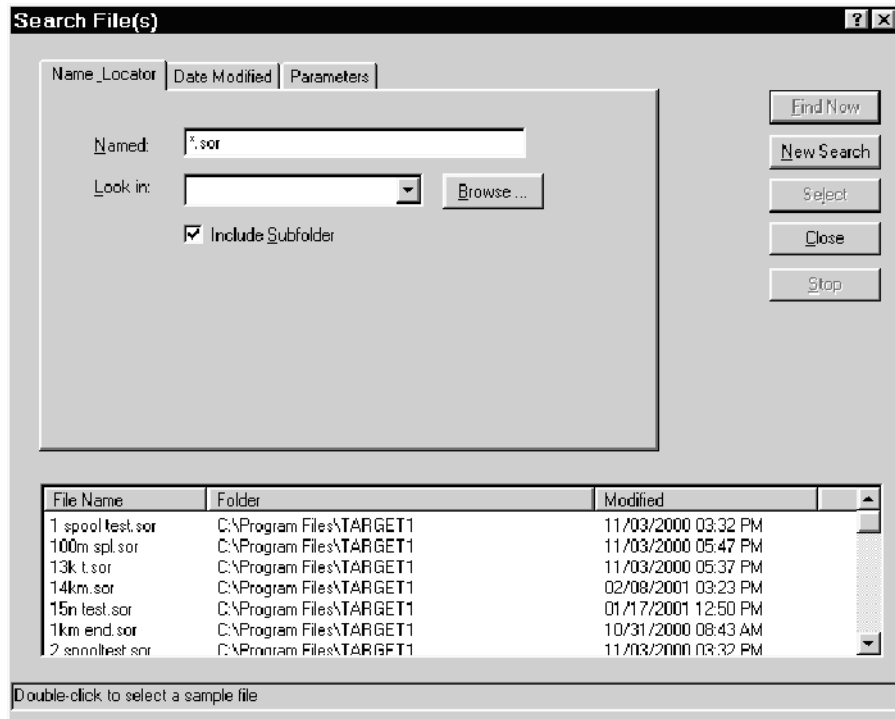


Figure 2-34: Search File dialog box

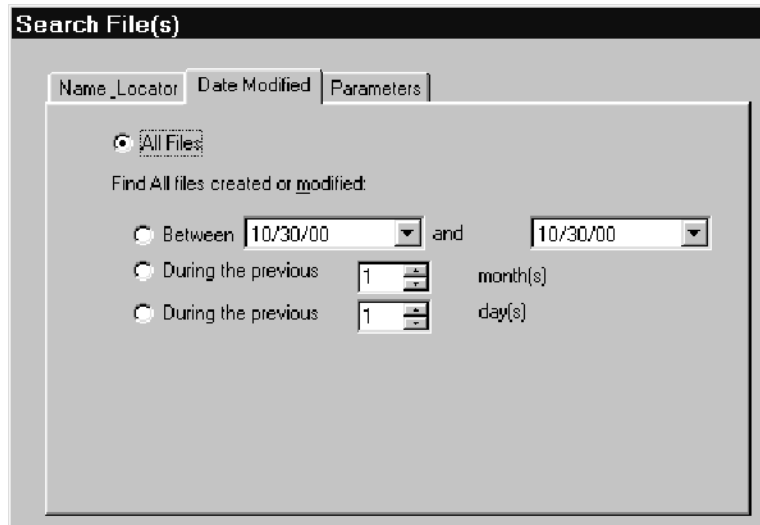
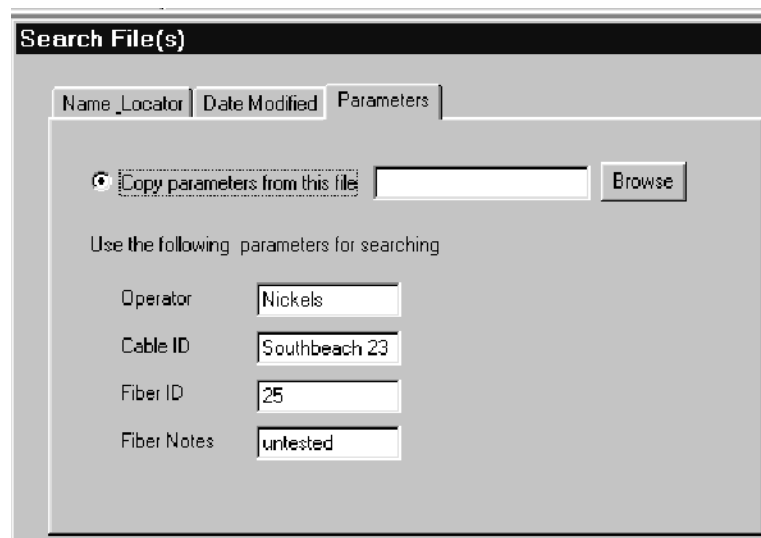


Figure 2-35: Search by date option

Search by Parameters. Use this option to locate files that match selected file parameters. You can fill in the file parameter or parameters to use or copy parameters from a selected file. To copy file parameters, click the **Copy parameters from this file** selection box, and use the **Browse** button to search the directory for the file to use. Any parameters associated with the file are loaded in the appropriate box in the parameters list. See Figure 2-36.

NOTE. The search parameters in the Parameters tab are all fields that you can modify with a template. You can use a template to alter the file description fields to make future searches easier. See Template Selection on page 2-66.



Search File(s)

Name Locator | Date Modified | Parameters

Copy parameters from this file

Use the following parameters for searching

Operator	<input type="text" value="Nickels"/>
Cable ID	<input type="text" value="Southbeach 23"/>
Fiber ID	<input type="text" value="25"/>
Fiber Notes	<input type="text" value="untested"/>

Figure 2-36: Search by parameter option

Search File Control Buttons. The control buttons direct the action of the search:

- **Find Now.** When you have made your search selection, click **Find Now** to conduct the search.
- **New Search.** Click **New Search** to clear any files in the search list from a previous search.
- **Select.** Select a file in the list and then click **Select** to choose that file.
- **Close.** Click **Close** to exit the Search Files(s) dialog box.

Template Selection

The Template dialog box allows you to use data from a specific trace file as a template or to create your own template. When you apply a template to the report, events and other information are added to each data file in the report.

The data that is transferred from the template trace to other trace files includes:

- Events and event notes
- Operator name
- Fiber ID
- Cable ID
- Fiber notes

Events Info Tab. The events in the template file are implemented across all the selected files in the report file list. You can browse for and select a file to use as a template. You can then edit the template by adding or deleting events. If you choose to Delete Non-template Events from the files for the report, only the events at the locations listed in the table of the Event Info tab will be shown in the report. See Figure 2-37.

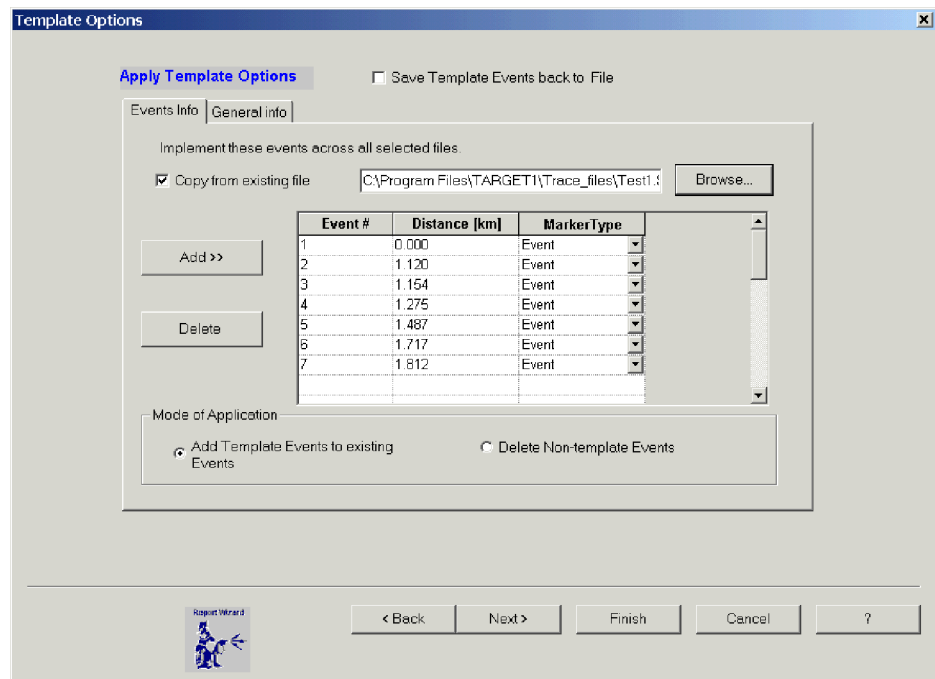


Figure 2-37: Template events info tab

General Info Tab. The following information can also be applied from a template: Operator ID, Cable ID, Fiber ID, and Comments. Select the General Info tab to add or replace the information in the files. See Figure 2-38.

You can add or delete events and landmarks to and from the template. You can also add template events to the existing events of a file or delete the non-template events from a file or set of files.

Select the **Save Template Events back to File** box to save the added events as part of the existing file.

Figure 2-38: Template general information dialog box

Add Event to Template. In general, all occurrences on the trace are events, but they can be classified as measurement events such as splice loss, reflectance, and end of fiber, or as landmarks that are added by the operator to indicate physical locations of points of reference. Click the **Add Event** button to display the dialog box shown in Figure 2-39.

Designate the event type by clicking the appropriate check area. Enter the distance to the event. Distance is specified from the front panel of the OTDR.

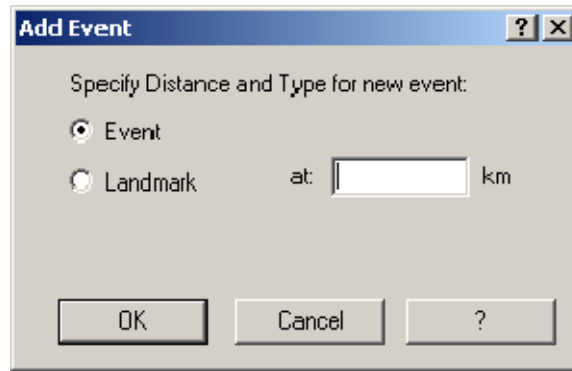


Figure 2- 39: Add event or landmark to template dialog box

Building a Template File

You can use any trace file as a template or the basis of a new template.

To build a template from an existing file, click **Copy from existing file** in the Apply Template Options dialog box (see Figure 2-40). Click the **Browse** button to display the Open dialog box. Locate the file you want to use for a template. Highlight the file name and click **Open** to display the events of the file.

In the **Events Info** tab, add, delete, or modify the events to your template requirements.

Click the **General Info** tab to enter or edit the Operator ID, Cable ID, Fiber ID, and Comments to your template requirements. In the General Info tab, select either **Append fields** or **Replace fields** as the method for adding general information from the template file to the files of the report.

If you want to build a template without loading anything from an existing file, leave **Copy from existing file** unchecked. Make the appropriate template entries directly into the table cells. The **Marker Type** column has a selection arrow that you can use to designate the event type as an **Event** or a **Landmark**. You can also use the **Add Events** or **Delete Event** buttons to alter the template events.

Before applying the template to the report files, select either **Add Template Events to the existing events** on the trace file or **Delete Non-template Events**.

After all the template choices are made, click the **OK** button. The report will be recalculated based on the new template applied to the file.

To save the template changes for later use or as a record of the template changes, check **Save Template Events Back to File**. The changes are saved to the file.

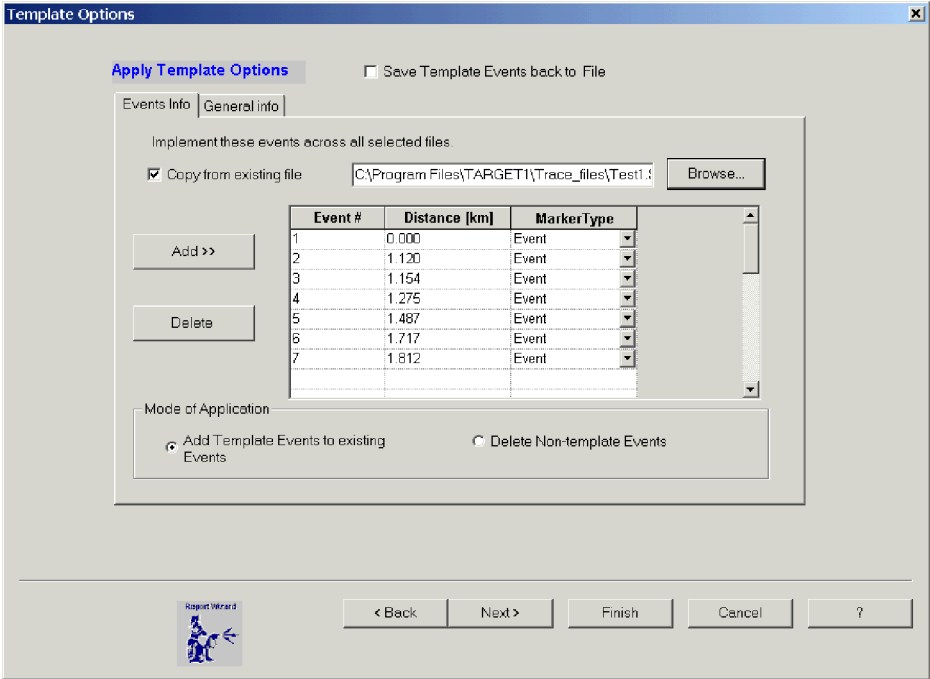


Figure 2-40: Template Options dialog box

Analysis Selection

The Analysis dialog box, shown in Figure 2-41, is next in the Report Wizard. You can also access it by clicking the Analysis button.

You can select additional analysis options for the report. You can select Auto 2-Point Loss or ORL measurements and you can zoom on selected portions the fiber trace.

Auto Two Point Measurement Options. You can select either or both of these auto measurements for additional analysis of the report data (see Figure 2-42):

- Make Auto two-point loss measurement. Use the cursor position options to place the distance cursors for the automatic measurement.
- Make Auto two-point ORL measurement. Use the cursor position options to place the distance cursors for the automatic measurement.

Cursor Position Options. You can place the cursors in the report trace to indicate where the Auto Two-Point Measurement is to be made. The placement options are as follows:

- Place cursors at location saved in each file.
- Place cursors on the first and last events.
- Place cursors on the second and last events. (Use this option if the first event is the connector to the OTDR.)
- Place cursors at specific distances. Enter distance values for the Left and Right Cursors in the distance edit boxes to define the cursor placement for the auto two-point measurement.

Auto Zoom Options. Use the Auto Zoom selection to choose a zoom area for the trace that is displayed for the report. See Figure 2-43. Select one of the following zoom choices if you want to see a zoomed display in the report trace:

- Zoom in to section saved in each file (same size, centered on the active distance cursor).
- Zoom between the first and last events. This expands the graph to show the trace between the first and last events.
- Zoom between the second and last events.
- Zoom to between distances: Enter the left and right edge distances in the edit boxes to define the zoom area.

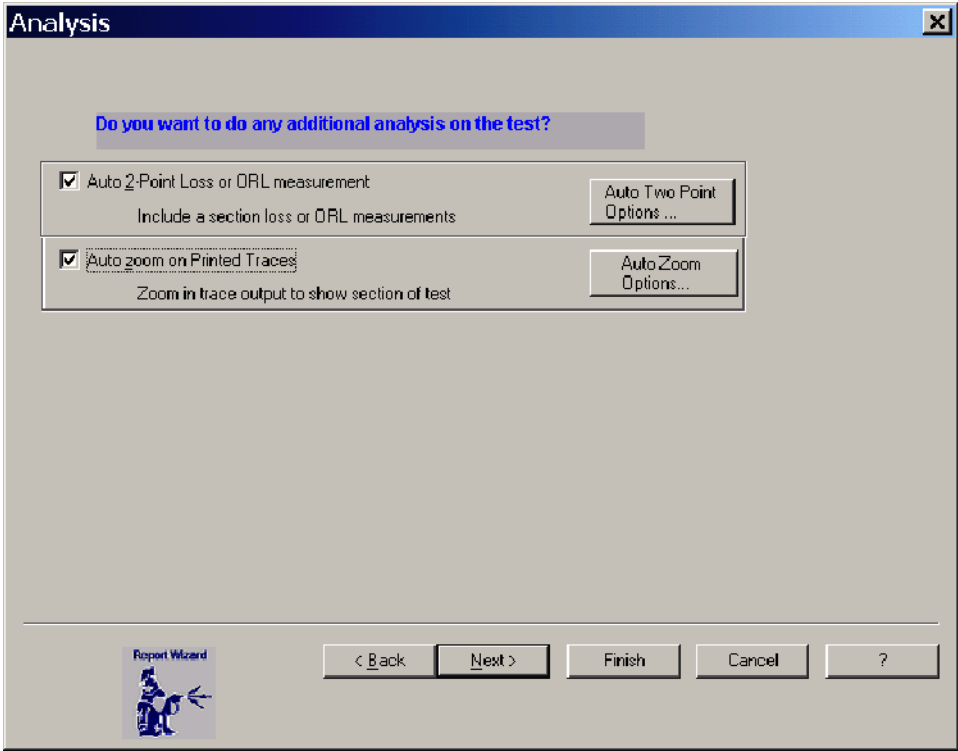


Figure 2-41: Report Wizard analysis dialog box

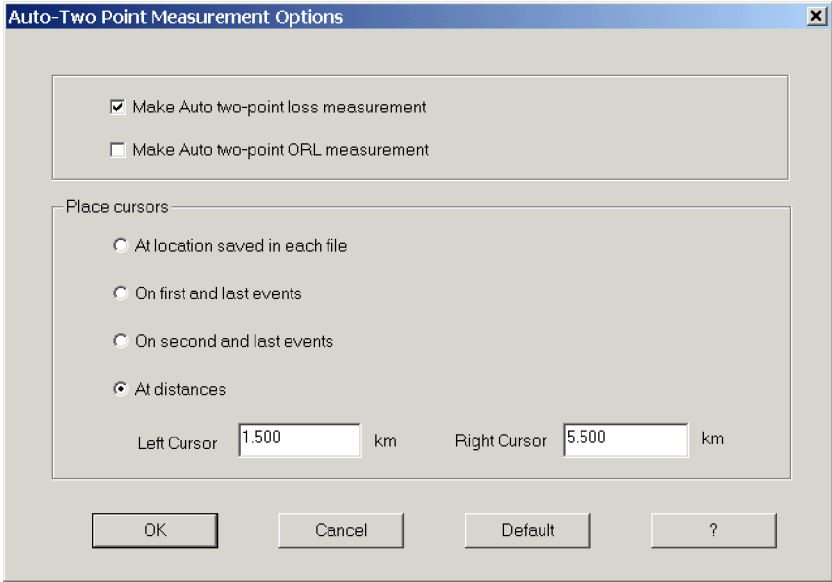


Figure 2-42: Analysis Auto Two-Point Measurement options

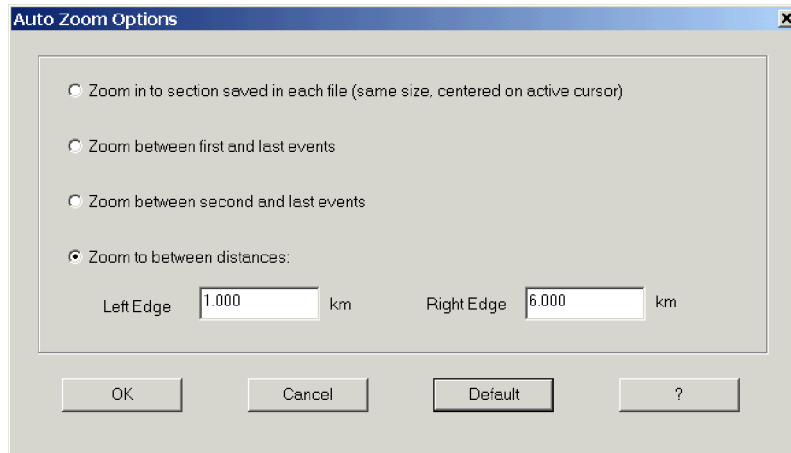


Figure 2- 43: Analysis Auto Zoom options

Test Settings and Limits

TARGET1 checks the files listed in the first file name group to determine what wavelengths are present. A settings tab is generated for each unique wavelength found in that group (see Figure 2-44). The test settings for the first file read for each wavelength are loaded into the dialog box.

If you need to correct a setting or make new limit choices (to find events or delete events at different limits), you can make those changes in the Test Settings and Limits edit boxes. (Changes made to a wavelength tab do not affect other wavelength tabs.) When all the changes have been made, click the **Next** button (if you are using the Wizard to set up a report) or **OK** (if you are not using the Wizard). If the report has been generated once, or no other changes are needed, click the **Finish** button.

The report is regenerated with the changed test settings and limits. If new limits cause more events to fail, then in the original file those events are marked in the event table. If fewer events fail, those events become unmarked in the event table.

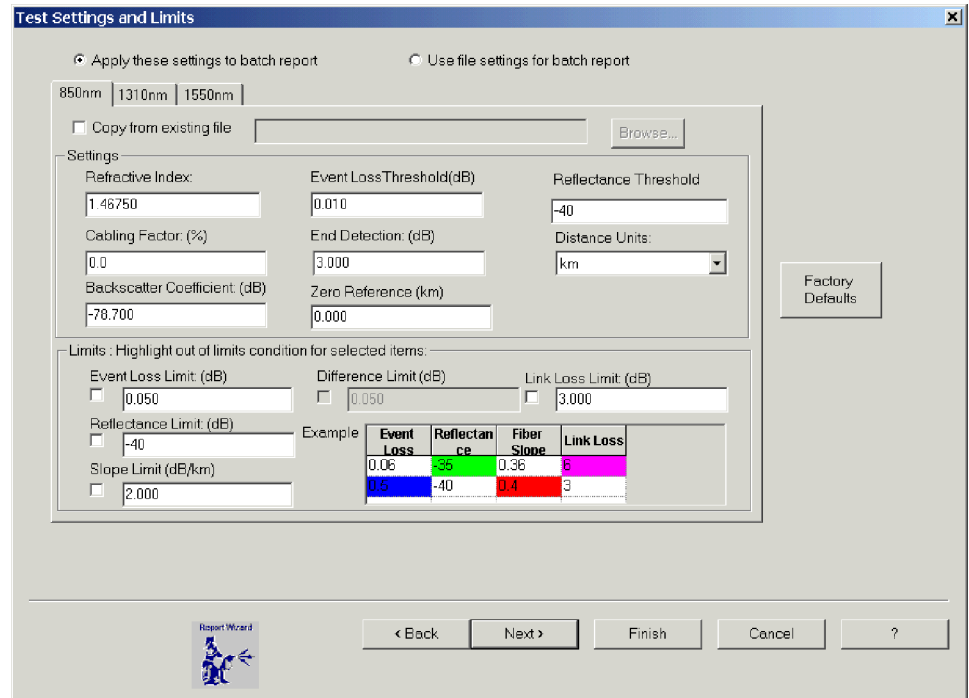


Figure 2-44: Test Settings and Limits

Use or Modify Existing File. Select an existing file from which to load settings. Click the **Copy from existing file** selection box, and then use **Browse** to select a file. Settings associated with the selected file are entered in the settings windows. You can use the settings as loaded or modify them.

Settings. Set the values for Refractive Index, Cabling Factor, Backscatter Coefficient, Event Loss Threshold, End Detection, Zero Reference and Reflectance Threshold values. You can also set the distance units to feet, miles, meters or kilometers. If the event marking puts an event past the end of the fiber, you can reduce the End Detection level to correct the situation. The End Detection level can be set to a value from 1 to 20 dB. A typical setting might be 5 dB.

Limits. Use the limits to define out-of-tolerance conditions. You can set limits for Event Loss, Reflectance, Slope, Difference or Link Loss. Values that exceed these limits are highlighted in the report.

Factory Defaults. The factory default settings provide reasonable values for the settings and limits for testing. You can use the factory defaults as a starting point if you are not using a sample file as a template.

Report Formats

There are two report types: Fiber Summary Report and Batch Output Multi-page report. You can select either or both types to output from the Report Wizard.

The formatting choices depend on the report tab you select in the Report Format dialog box (shown in Figure 2-45). A summary report compiles information from the selected fiber files in one report. A batch output is a separate report for each fiber file selected.

Fiber Summary Report

Select components you want to appear in the report. You can include the Summary Table, the Sample Trace, a Report Summary, the Summary Cable Information, and a Summary Header/Footer. When you select one of these components to be included in the report, you can also select elements for that component (except for the Sample Trace).

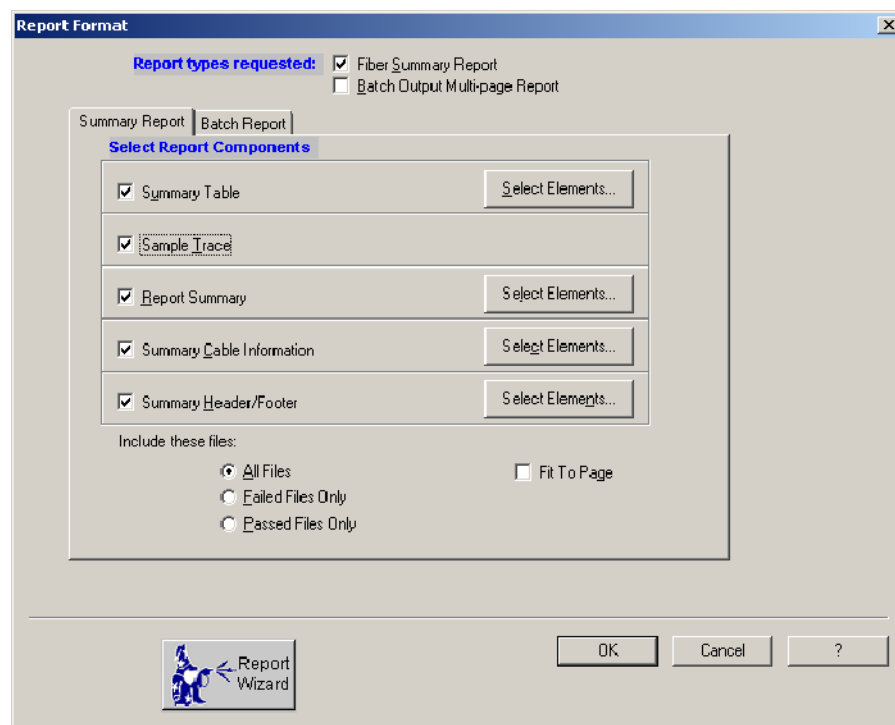


Figure 2-45: Summary Report component selection

Summary Table. The Summary Table is always included in the report. Check any additional components you want to appear in the report (see Figure 2-45), and then click the **Select Elements...** button to make additional selections to add items to that component. Once selected, the component remains checked for the duration of the active session. Exiting the application and starting it again reverts

to the default selections for all report components and elements of the component.

You can change the order in which the selected measurements appear in the report. Click an element in the list, and then click the up arrow or the down arrow to change the element's position in the list.

Sample Trace. Check to include the trace view in the report.

Report Summary. Several elements can be added to the default selection. The defaults are Fiber Length Average, Link Loss Average, and Report notes. The maximums and minimums for those and others can be added to the report. Click the Change the Order arrows to move a selected element to a higher or lower place in the display order. Click in the Report Summary display box to add the vertical scroll bar so that you can view the complete list if it exceeds the default display area.

Summary Cable Information. The default selection components are filename, acquisition date, and Fiber notes. You can add test settings, Two Point Loss measurements, Two Point ORL measurements, and Two Point Distance readout to show in the Cable Information display area. Click in the Cable Information display box to add vertical scroll bar so that you can view the complete list if it exceeds the default display area.

Summary Header/Footer. Select this item and click the associated Select Elements button to set up the title, header, and footer. You can include page numbers, total page count, date, and time, as well as type in your own text. The default footer follows:

Tektronix TARGET1 Analysis SW [date] [time]
[page count]

Report Elements

Select any components you want included in the report. When you select a component checkbox, the **Select Elements** button becomes available.

- **Summary Table:** Click **Select Elements** to select the measurements and measurement tabs you want to appear in the summary table. This displays the dialog box shown in Figure 2-46. Click the **Select All** button to include the complete list in the table. Click the **Clear All** button to deselect any selected components. You can then select only those components you want in the summary table for the report. Click the **Default** button to check the factory default choices shown in Figure 2-46 for the summary table and measurement tabs.

You can change the order in which the selected measurements will appear in the report. Click an element in the list, and then click the up arrow or the down arrow to change the position of the element in the list.

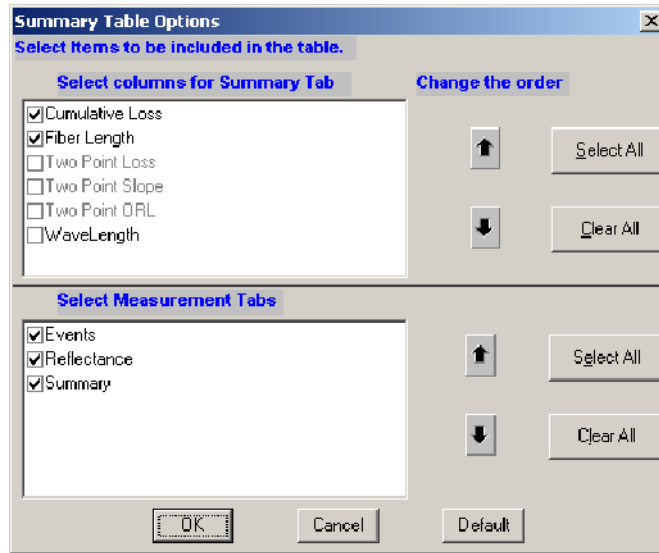


Figure 2-46: Summary table element selections

- **Sample Trace:** Select to include the trace view in the report.
- **Report Summary:** Select the summary elements you want to appear in the report. See Figure 2-47. The default selection provides a short list of elements. You can choose other elements from the Average and Maximum choices for Fiber Length, Link Loss, Fiber Slope, Connector Loss, and Link ORL.

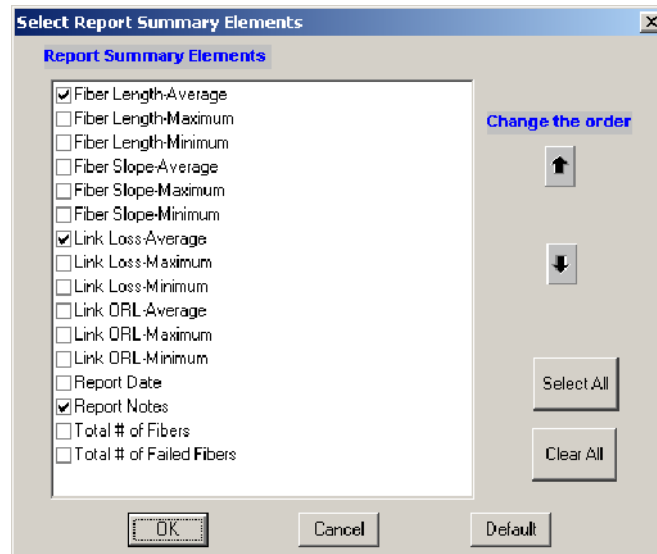


Figure 2-47: Report Summary element selections

- **Summary Cable Information:** Select the types of cable information you want to appear in the report. See Figure 2-48. The default selections are Filename, Acquisition Date, and Fiber Notes. You can add Settings, Two-Point Loss, Two-Point ORL, and Two-Point Distance to the cable information format. (The two-point measurements are only available if you have activated and defined them in the Analysis section.)

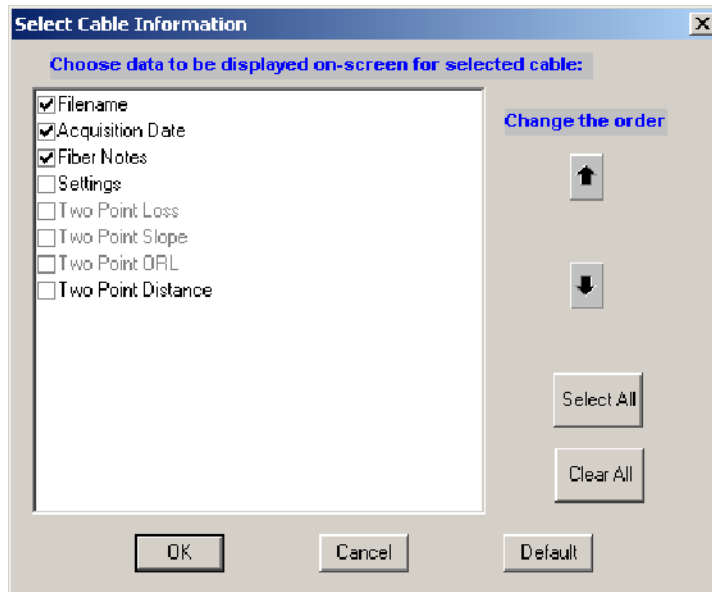


Figure 2- 48: Summary Cable element selections

- **Summary Header/Footer:** Enter the Report Title that you want to appear on the first page of the report. Enter the Header and Footer information that you want to appear on each page in the printed report. See Figure 2-49.

NOTE. *The Header/Footer formatting done in the Report Generator for the printed report is not exported.*

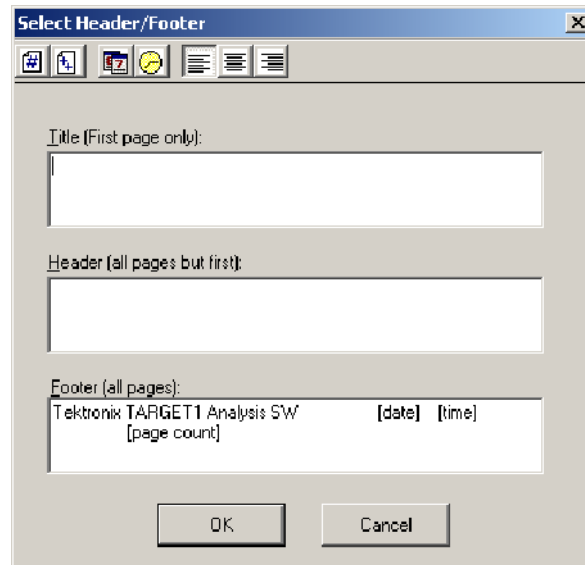









Figure 2-49: Report Header and Footer element selections

Page Format Elements. Use the shortcut icons described in Table 2-7 in the Select Header/Footer dialog box to set page numbering, time stamping, and text justification.

- **Include These Files:** Includes all files, failed files, or passed files only, depending on the report you produce.

Table 2-7: Header/Footer Page Element shortcut icons

Page elements	Action
	Adds the page number.
	Adds the page count.
	Adds the calendar date to the printed footer.
	Adds the computer time to the printed footer.
	Left justifies the text.
	Center justifies the text.
	Right justifies the text.

Select Batch Report Elements

On the Batch Report tab, you can choose to include Event Table, Trace, Cable Information, and a Header and Footer in the batch reports. See Figure 2-50. For each report component you want to include, you can select elements to include.

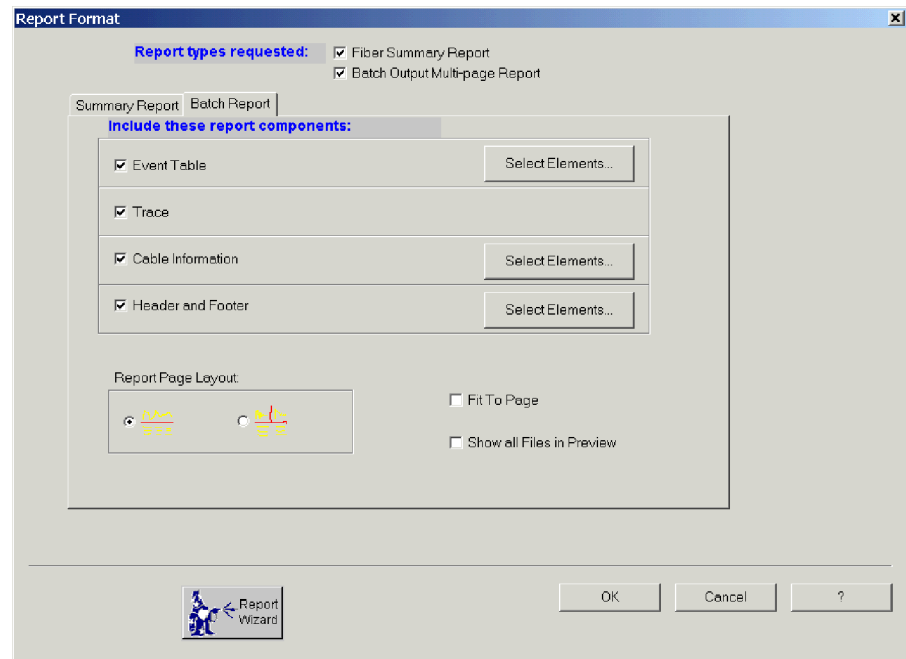


Figure 2-50: Batch report component selections

- Event Table:** Click **Select Elements** to select the measurement columns that you want to appear in each batch report. The list of items you can include are shown in Figure 2-51. You can also reorder the events as they will appear in the report. Click an element in the list, and then click the up arrow or the down arrow to change the element's position in the list.

Select the measurement tabs you want to appear in the event table. The default choices are: Distance, Event Loss, Reflectance, and Cumulative Loss, as shown in Figure 2-51.

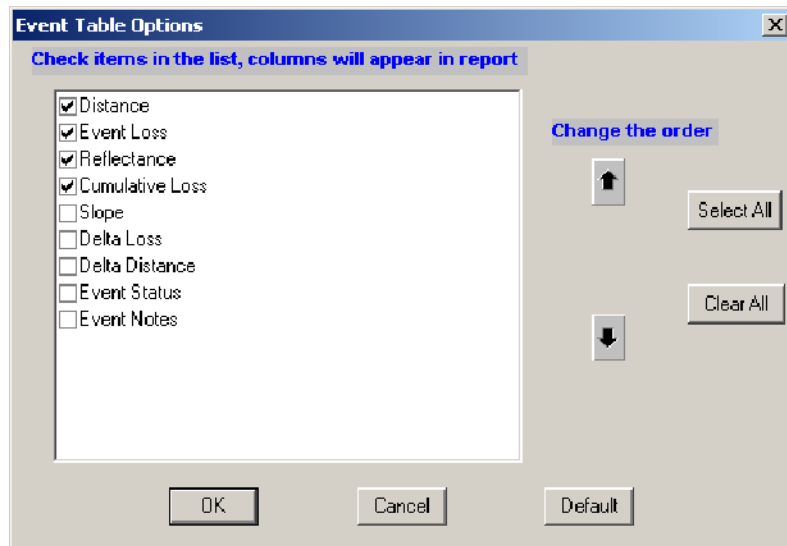


Figure 2-51: Batch Report Event Table Options dialog box

- **Trace:** Select to include the trace view in the report.
- **Cable Information:** Allows you to select the types of cable information you want to appear in the report. The information selections are Filename, Acquisition Date, Fiber Notes, Settings, Two Point Loss, Two Point Slope, Two Point ORL, and Two-Point Distance.
- **Header and Footer:** Enter the Title that you want to appear on the first page of the report. Enter the Header and Footer information you want to appear on the pages in the printed report.

Report Page Layout

Specifies the trace and table arrangement you want to appear in the report. See Figure 2-52. Select the left icon to print the graph over the table or the right icon to print two graphs side-by-side over the corresponding tables.



Figure 2-52: Selecting the report page layout

Fit to Page

Select Fit to Page to automatically make the fonts and column widths small enough and narrow enough to print the report on one page width. Check the

layout by selecting **File > Print Preview** to make sure you can read the report easily and that everything fits. You can also select **File > Page Setup** to toggle the page orientation between portrait and landscape.

Show all Files in Preview

Select **Show all Files in Preview** to include all files in the Batch Preview report; otherwise, only the first file is included in the Batch Preview.

Finish

When you have completed the report formatting selections, click the **Finish** button. Any template choices you made are processed on the selected files and the log file is saved as text. The report information (shown in Figure 2-27 on page 2-49) is displayed with the Report Summary, the Cable information, the trace, and the table. There will be a row in the table for each file included in the file. For reports that use more than one file per fiber (bidirectional, difference, and multiple wavelengths), files are grouped by fiber.

Preview and Printing

Preview either the summary file or the batch file by clicking the choice at the top of the display. A formatted page is displayed showing you what the printed file should look like when printed. When you want to print the file from the preview page, click the Print choice in the top menu bar. Refer to *Printing Trace Analysis Views* on page 2-31 for the procedures to setup the printer and printer page selections. The printing options depend on which printers are available on the network and which printer drivers are loaded in the computer.



Virtual CE for NetTek

Virtual CE for NetTek

You can use the Virtual CE for NetTek software to remotely control the NetTek Analyzer and any installed instrument modules. The software opens a virtual NetTek Analyzer display in a window on your PC. Using the mouse, you click elements of the virtual display as though you were tapping the display of the NetTek Analyzer. The software relays your actions to the NetTek Analyzer, which then performs them.

Requirements

Use of the Virtual CE for NetTek requires the following items:

- A NetTek Analyzer with Virtual CE enabled (unlocked)
- The client side version of Virtual CE for NetTek installed on the PC
- An active connection between the PC and the NetTek Analyzer

NOTE. *If your NetTek Analyzer came with Virtual CE, you may already have installed the Virtual CE for NetTek client software on your PC and have enabled Virtual CE on the NetTek Analyzer.*

There are no further installation requirements.

Installation

If your NetTek Analyzer did not come with Virtual CE, use the TARGET1 CD-ROM to perform two tasks:

- Install Virtual CE for NetTek client software on your PC
- Upgrade the NetTek Analyzer operating system to a version that includes Virtual CE

NOTE. *NetTek Analyzers with operating system hardware versions lower than version 1.117 require an operating system upgrade that includes the NetTek side of Virtual CE. You can download an operating system upgrade from www.tektronix.com.*

NetTek Analyzers with operating system hardware 1.117 or above include the NetTek side of Virtual CE although it may not be enabled. Use the procedure below to enable Virtual CE on the NetTek Analyzer.

Installing Virtual CE for NetTek on the PC

To install the Virtual CE for NetTek client software on your PC:

1. Insert the TARGET1 CD-ROM and navigate to the contents of the CD-ROM using Windows Explorer.
2. Double-click on the file named **virtualcefornetek.exe** to start the Virtual CE for NetTek client software installation.
3. Follow the on-screen instructions to install the Virtual CE for NetTek Software.

Refer to the NetTek Platform user manual for operation of the Virtual CE for NetTek software.

Enable Virtual CE on the NetTek Analyzer Platform

To use Virtual CE for NetTek, Virtual CE must be enabled (unlocked) on the NetTek Analyzer platform. The TARGET1 software includes a convenient method to enable Virtual CE on a connected NetTek Analyzer.

1. Connect your NetTek Analyzer to the PC (with TARGET1 software installed). Refer to the NetTek Analyzer platform user manual for instructions to make this connection.

NOTE. *Enabling Virtual CE on the NetTek Analyzer requires an ActiveSync connection. If your NetTek Analyzer did not include a Microsoft ActiveSync CD-ROM, you can download the program from the Microsoft Web site. Refer to the NetTek Analyzer User manual for ActiveSync installation instructions.*

2. Send the activation key to the NetTek Analyzer by selecting **Start > Programs > Tektronix TARGET1 > Activate Virtual CE on NetTek.**

Upgrading the NetTek Analyzer Platform

Refer to the TARGET1 ReadMe file for information about the NetTek Analyzer operating system requirements for using Virtual CE for NetTek. Access the ReadMe file by selecting **Start > Programs > Tektronix TARGET1 > ReadMe**. You can also navigate to the ReadMe file on the TARGET1 CD-ROM using Windows Explorer.

NOTE. *The NetTek Analyzer upgrade process requires that ActiveSync be disabled.*



Glossary

Glossary

Accuracy

The closeness of the indicated value to the true value.

Attenuation

A measure of the loss of optical signal power, expressed in decibels. Attenuation is a result of light absorption and scattering, caused by impurities in the fiber and the fiber's intrinsic material properties, and by extrinsic factors such as splices and physical bends in the cable. Loss is a function of fiber length; signal amplitude decreases as fiber length increases.

Attenuation coefficient

The attenuation of an optical fiber per unit length, typically expressed in dB/km.

Averaging

The number of times a trace is acquired and mathematically combined with previous tests to reduce the effect of noise and improve visibility of low-loss features. Averaging also increases the measurement accuracy and range for a given pulse width.

Backscatter

The portion of Rayleigh scattering that travels in the opposite direction of the optical signal. (See *Rayleigh scattering*.)

Backscatter coefficient

A number representing the amount of backscatter reflected by a particular fiber. The number is fiber dependent and can usually be obtained from the fiber manufacturer. The scattering coefficient affects reflectance measurements.

Cabling Factor

In an optical fiber, the optical length can be longer than the external length of the cable due to spiraling in the cable bundle. The cabling factor is a percentage applied to the optical distance measured to derive the physical distance in the bundled cable.

CFF

Tektronix OTDR Common Files Format.

Cladding

A layer of material such as glass or plastic that is fused to, and surrounds, the core of an optical fiber. The cladding has a lower refractive index than the core, which helps to contain the light travelling within the core.

Core

The center of an optical fiber where most of the light is carried. The core has

a higher refractive index than the surrounding cladding, which helps to contain the light travelling within the core.

Coupler

A device for splitting the optical signal from one fiber into two or more different fibers.

Dead zone, event

The event dead zone, sometimes called the two-point spatial resolution, is the minimum distance after a reflection before the OTDR can accurately measure the distance to a second reflection. Sometimes it is determined as the distance from the leading edge of the reflection to the point past the reflection where the OTDR signal drops at least 1.5 dB from the top of the reflection.

Dead zone, loss

The loss-measurement dead zone is the minimum distance after a reflective event before the OTDR can accurately measure the loss of a following event as a separate measurement from the first event. Typically, it is determined as the distance from the leading edge of the reflection to the point past the reflection where the OTDR signal returns to within 0.5 dB of the backscatter level.

Decibel

A unit of measure comparing two power levels. A decibel, or dB, is defined as ten times the base 10 logarithm of the ratio of two power levels. A gain or loss in power is expressed in decibels. For example, a 3-dB loss is an approximate 50% decrease in power, a 2-dB loss is an approximate 37% decrease in power, and a 1-dB loss is an approximate 21% decrease in power.

Detector, optical

A device that generates an electrical signal (typically an electric current) when it detects light.

Dynamic range

Several definitions exist for OTDR dynamic range. Bellcore defines the dynamic range as the displayed attenuation (in dB) from the backscatter level at the front panel to an imaginary line (past the end of the fiber) that lies just above 98% of the noise. Another common definition (based on SNR = 1) uses an imaginary line that lies just above roughly 63% of the noise. If the OTDR saturates near the front panel, the backscatter level at the front panel is inferred by extrapolating back to the front panel from the non-saturated region of the waveform.

Dynamic range, end detection

The maximum distance that an OTDR can detect the reflection from a cleaved fiber end. This is much greater than the distance over which the OTDR can make splice-loss measurements.

Event

1. Any break or connection in an optical fiber that appears on an OTDR display as change or discontinuity in the normal backscatter signature of the fiber. Events can be caused by mechanical and fusion splices, connectors, bends, and breaks in the fiber.
2. A square marker on the trace to indicate a change in fiber characteristics that exceeds the preset tolerance. Events can be added by the OTDR or operator.

End of Fiber Threshold

The loss level (in dB) used to indicate the end of the fiber.

Fresnel reflection

Reflection resulting from a discontinuity in the fiber's index of refraction. Fresnel reflections can be caused by a cleaved fiber end, an unterminated connector, a mated connector, or mechanical splices. On an OTDR, Fresnel reflections appear as sharp, upward-pointing spikes.

Fusion splice

A method of connecting two optical fibers that involves aligning and heating the fiber ends so that the glass structures of each fiber melt and are "welded" together.

Gainer

A splice that increases the backscatter reflections to the testing device. The slope of the loss per unit distance trace made with an OTDR shows a step up at the gainer rather than a loss (a small step down) as is usual at a splice. A gainer can be caused by a misalignment of the fiber when making a fusion splice. This effect can also occur when a fiber with a higher backscatter coefficient is spliced into a link.

Graded-Index Fiber

An optical fiber with a core having a refractive index that decreases with increasing radial distance from the fiber axis. The most common refractive index profile for a graded-index fiber is very nearly parabolic. The parabolic profile results in continual refocusing of the rays in the core, and compensates for multimode distortion.

IntelliTrace

IntelliTrace is a testing mode of the Tektronix OTDR that automatically locates and measures all events found on the fiber. It is the easiest and most commonly used testing mode of the OTDR. IntelliTrace is a single-button test that adjusts the test setups to produce the best resolution for measuring close-in events, while maintaining the dynamic range needed to measure distant events on the fiber. IntelliTrace testing mode automatically adjusts the Test Range, Pulse width, and Averages settings when real-time and high-density tests are made. All other test settings are set by the operator.

Kilometer (km)

1,000 meters or 0.6 statute miles.

Kilofeet (kf)

1,000 feet or 0.3 kilometers.

Landmark

A house-shaped marker on the trace that indicates a geographical location. Landmarks are added by the operator. Landmark notes can also be added to the test file to describe the landmark and explain the addition of the landmark marker to the test file.

Laser

Acronym for light amplification by stimulated emission of radiation. A device that produces a coherent beam of optical radiation by stimulating electronic, ionic, or molecular transitions to a higher energy level such that when they return to a lower energy level, light energy is emitted.

Macrobends

Macrobends occur when a fiber is flexed beyond its minimum radius bend and the fiber leaks light.

Mechanical splice

A method of connecting two optical fibers that involves mechanically joining or bonding the two ends of the fibers together.

Microbends

Microbends are very small distortions in the fiber. They are typically defects caused during manufacturing and appear as very small fusion splices on the OTDR display.

Mode

As used in this manual, a main window and the operations available from it. (To access Trace Analysis Mode, click the Trace Analysis button; to access Report Generation Mode, click the Report Generation button.)

Multi-mode fiber

1. An optical fiber that supports propagation of more than one bound mode.
2. One of two fundamental types of optical fiber (multimode and single-mode). A multimode fiber transmits multiple rays (or modes) of light. Multimode fiber cores are between 50 and 100 microns in diameter, larger than those of singlemode fibers.

Nanometer (nm)

A unit of length, one billionth (10^{-9}) of a meter. The wavelengths of light sources used in OTDRs are often expressed in nanometers. For example, singlemode fibers typically operate at wavelengths of 1310 and 1550 nanometers.

Optical fiber

A filament of transparent dielectric material, usually glass or plastic, and usually circular in cross section, that guides light pulses from a transmitter to a receiver at very high data rates. The light pulses are optical signals that can carry voice, data, and video information. An optical fiber usually has a cylindrical core surrounded by, and in intimate contact with, a cladding of similar geometry. The refractive index of the core must be slightly higher than that of the cladding for the light to be guided by the fiber (for total internal reflection of the light in the fiber).

OTDR (Optical Time Domain Reflectometer)

An optoelectronic device used to characterize an optical fiber. An OTDR injects a series of optical pulses into the fiber under test. It then extracts, from the sending end of the fiber, light that is scattered and reflected back to the source. The intensity of the return pulses is measured and integrated as a function of time, and is plotted as a function of fiber length. An OTDR may be used to estimate the length of a fiber and its overall attenuation, including splice and mated-connector losses. Another use is to locate faults in the fiber, such as breaks.

Package, software

See *Software package*.

Pulse width

The duration in time that the laser pulses the fiber. Large pulse widths provide greater range while small pulse widths provide greater distance accuracy.

Rayleigh scattering

Scattering produced from microscopic nonuniformities in optical fiber that are very small relative to the wavelength of light. In optical fiber, Rayleigh scattering represents the fundamental limit to the attenuation coefficient. OTDRs measure the optical loss of components by measuring the attenuation in the backscatter component of the Rayleigh scattering across the event. Rayleigh scattering is inversely proportional to the fourth power of the wavelength. (See backscatter.)

Reflectance (or return loss)

The ratio of returned power to input power in dB. Typical values are -20 dB (large reflectance) to -50 dB (small reflectance).

Reflectance Threshold

The reflection level (in dB) used to indicate a reflection event.

Refractive Index

The ratio between the speed of light in a vacuum to the speed of light in a transmission medium (fiber). Refractive index varies between fibers. Its value affects the distance accuracy of OTDR measurements.

Scattering Coefficient

See *Backscatter coefficient*.

Signal-to-noise ratio

The ratio of the signal power to the noise power in an optical detector or electronic amplifier.

Single-mode fiber

One of two fundamental types of optical fiber (multimode and singlemode). A single-mode fiber transmits only the lowest order bound mode of the wavelength of interest, as opposed to multimode fibers that can accommodate multiple wavelengths. Single mode core diameters range from 3 to 10 microns, smaller than those of multimode fibers.

Software package

As used in this manual, the part of the Target1 application that deals with files from a particular type of optical equipment, such as the OTDR Trace Analysis Package.

SOR

Telcordia standard optical record format.

Splice

The joining of two separate optical fibers. Splices can be mechanical (connectors) or fusion (joined by melting together the ends of the fiber).

Splice loss

The optical power attenuation at the point where two optical fibers are joined, typically expressed in dB. Any loss of optical power at a splice is a splice loss. A practical splice of optical fibers has losses for a number of reasons. Some losses are due to fiber properties and others are due to the method or device used to make the splice.

Splice threshold

The loss level (in dB) used to indicate a splice.

Step-index profile

For an optical fiber, a refractive index profile characterized by a uniform refractive index within the core and a sharp decrease in refractive index at the core-cladding interface. The step-index profile corresponds to a power-law index profile with the profile parameter approaching infinity. The step-index profile is used in most single-mode fibers and some multimode fibers.

Step-index fiber

An optical fiber with a core having a uniform refractive index.

Tail

In an optical time-domain reflectometer, the optical detector typically requires a recovery time following a reflective event before the signal returns

to the normal backscatter level. This appears on the waveform as a sloping region from the top of the reflection to the normal backscatter trace. This sloping region, or tail, following a reflection is partially responsible for the dead zone where backscatter cannot be measured accurately.

Two-point loss

The loss between two points on an optical fiber. Two-point loss can include loss caused by fiber backscatter, connectors, and splices.

Wavelength

1. The distance between zero cross over points 360 degrees apart in the sinusoidal representation of a periodic waveform (frequency / velocity of propagation).
2. The distance between two crests or troughs of light waves.

Window

In fiber optics, bands of wavelengths that are useful for communications through a glass fiber. These bands are determined by the propagation properties of the fiber. Several windows are defined:

- The first transmission window of silica-based optical fibers is at approximately 830 nm to 850 nm.
- The second window is at approximately 1300 nm. The second window is the minimum-dispersion window for silica-based glass fibers.
- The third window is at approximately 1550 nm. This is the minimum-loss window for silica-based glass fibers.

WFM

Tektronix FiberMaster file format.

Zoom

Expansion of a defined area of a waveform. The expansion can be vertical, horizontal, or both.

Zoom box

The visual representation (outline) of the area of the waveform that will be expanded to the full trace area when zoomed.



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