

FLX380 FlexTester

User Guide

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Safety Information



WARNING! Use of procedures or adjustments other than those specified herein may result in hazardous radiation exposure.

1310/1550 nm OTDR/OLS port 1310/1490/1550 nm OTDR/OLS port 1310/1550/1625 nm/Live Fiber filter/PON meter OTDR/OLS port	This is a CLASS I LASER output
VFL port	This is a CLASS II LASER output. Do not stare into beam



WARNING! Use only the specified AC adapter. Use of another type of AC adapter can damage the instrument and create the danger of fire and electrical shock.



WARNING! To avoid the danger of fire and electrical shock:

- Never use a voltage that is different from that for which the AC adapter is rated.
- Do not plug the unit into a power outlet that is shared by other devices.
- Never modify the power cord or excessively bend, twist, or pull it.
- Do not allow the power cord to become damaged. Do not place heavy objects on the power cord or expose it to heat.
- Never touch the AC adapter while your hands are wet.
- Should the power cord become seriously damaged (internal wiring exposed or shorted), contact the manufacturer to request servicing.



CAUTION! Do not run any tests or perform functions that activate an FLX380 laser unless fiber is attached to the corresponding OTDR port.



CAUTION! To avoid serious eye injury, never look directly into the optical outputs of fiber optic network equipment, test equipment, patch cords, or test jumpers. Refer to your company's safety procedures when working with optical systems.

NOTICE: A FLX380 contains no user serviceable parts. Except for changing batteries and cleaning optical ports, this instrument must be returned to NOYES or authorized agents for repair and calibration.

IMPORTANT: Proper care in handling should be taken when using any precision optical test equipment. Scratched or contaminated optical connectors can impact the performance of the instrument. It is important to keep the dust caps in place when the unit is not being used.

General Information

This user’s guide provides operating instructions for testing fiber optic networks with the FLX380 FlexTester and assumes that you have basic knowledge about testing fiber optic networks. The purpose of this user’s guide is to explain how to use and maintain your FLX380 FlexTester. Please check our web site at www.AFLglobal.com, NOYES Test and Inspection for updates to this manual, software updates, and additional application information. If you have any questions about your FLX380 and recommended accessories, or if you need technical or sales support, please contact NOYES Customer Service.

Contacting Customer Service

You may call NOYES Customer Service between 8 AM and 5 PM, United States Eastern Time.

Phone 800-321-5298

603-528-7780

Fax 603-528-2025

Mail: NOYESTechSupport@AFLglobal.com

Recommended Accessories

Fiber optic test jumpers are required to connect an FLX380 to the fiber under test. Test jumpers must have the same core and cladding size as the fiber under test. The connector at one end of the test cable must mate with the appropriate optical port on the FLX380. The connector on the other end must mate with the fiber optic link under test.

Launch and Receive cables are required to measure the insertion loss and reflectance of the near-end and far-end connectors respectively, on the fiber link being tested. NOYES Fiber Rings may be used as Launch and Receive cables. Fiber Rings with a variety of lengths and connector styles are available from AFL. The table below helps in selecting the right test jumpers or cables for a test.

To do the following	Use the following accessories to connect OTDR to the fiber under test	Use the following accessories to terminate far-end of the fiber under test
<ul style="list-style-type: none">Fault locate - find a breakMeasure link length	Test Jumper (1-2 m typical)	None
<ul style="list-style-type: none">Measure near-end connector lossMeasure near-end connector reflectance	Launch cable *	None
<ul style="list-style-type: none">Measure both near-end connector loss and reflectance, and far-end connector loss and reflectanceMeasure end to end link loss and return loss	Launch cable *	Receive cable *

* Such as NOYES 150 m Fiber Ring.

Minimum fiber ring length may be determined as follows:

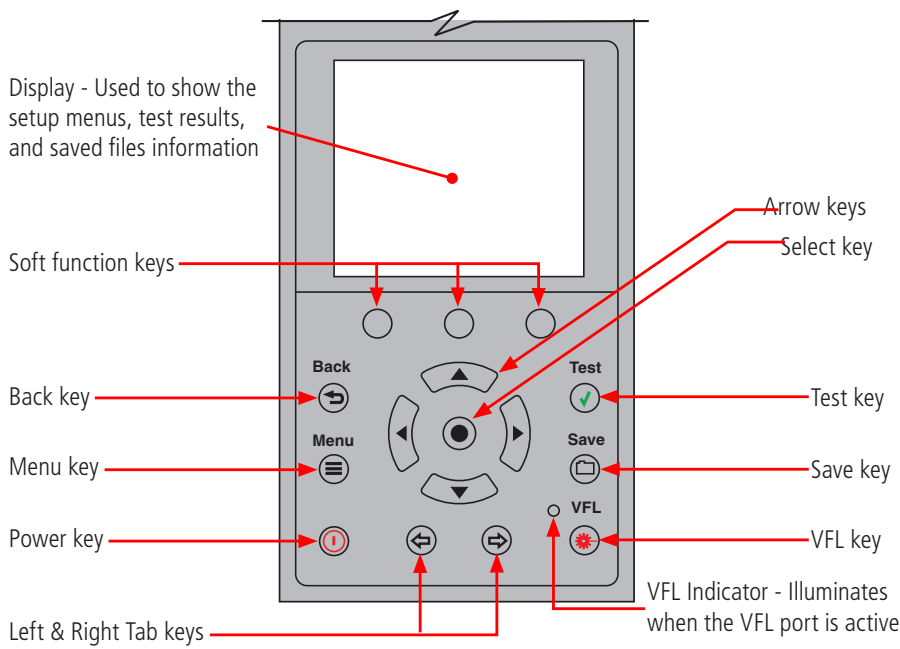
- Determine the widest pulse width you expect to use for your testing application (e.g. 1 us).
- Divide the pulse width (in ns) by 10 ns/m, the approximate speed of light in glass fiber. This provides a length in meters.
- Multiply the length in meters by 3 to determine the minimum length of the launch fiber you should use.

FLX380 Hardware Features

Front Panel (Keys and Display)

The FLX380 front panel contains keys, indicator, and a display. The use of the [Power], [Menu], [Test], [Back], [Save], and [VFL] keys are fixed. The use of the soft function keys and arrow keys depends on which menu or editor submenu is displayed.

Function of each key is explained in the section titled 'Using FLX380 Keys'.

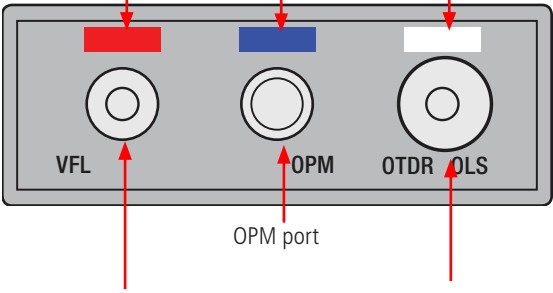


Top Panel (Test Ports)

Red colored bar indicates the VFL test port

Blue colored bar indicates the OPM test port - Input for the standard optical power meter

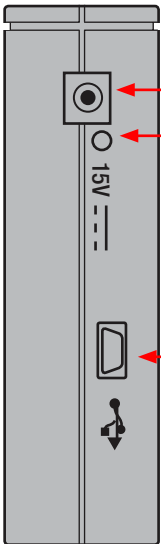
OTDR/OLS test port
Silver bar - UPC ferrule
Green bar - APC ferrule



VFL port - This is a CLASS II LASER output.
Do not stare into beam!
The visual fault locator (VFL) port is a 650 nm (red) laser.

OTDR/OLS port
This is a CLASS I LASER output
and input for FTTx PON meter
(FLX380-103 model only)

Side Panel (USB and Power Ports)



Power port - This is the interface for the AC power adapter/charger.











AC/Charger indicator - When ON, indicates that an AC adapter is connected to the FLX380.

- Red light - rechargeable battery is charging.
- Green light - rechargeable battery is fully charged.

USB function port - Allows connection to a PC for transferring stored test results.

Front Panel Keys

The use of each key is summarized in the table below.

Key Symbol	Key Name	Key Function
	Power	Press and hold (~1 second) to turn the FLX380 on or off.
	VFL laser	Visual Fault Locator (red laser) ON - Press and hold (~1 second) LED will flash ON - Press and hold (~1 second) LED will be solid OFF - Press and hold (~1 second) LED should be OFF
	Menu	Press to access the Main Menu.
	Left and Right Tab keys	Press to display the next/previous available Menu Tab or Test View Tab.
	Arrow (Navigation) keys	The arrow keys provide several functions: <ul style="list-style-type: none">• Main Menu: these keys are used to navigate menus and change setup parameters.• Trace Page: in the Zoom mode these keys are used to adjust zoom. In the Move mode, Left and Right keys are used to move cursors.
	Select (A/B)	This key provides several functions: <ul style="list-style-type: none">• Main Menu: press this key to display a submenu (if available).• Trace Page: press this key to toggle the active cursor between A and B
	Back	Press once to return the previous page. Press one or more times, depending on which menu or editor submenu is displayed, to return to the Main Menu.
	Test	Press to start or stop a test.
	Save	This key provides several functions: <ul style="list-style-type: none">• Save the currently displayed test results• Set current folder• Set current file name• Review results
	Soft function keys (under display)	The label shown in the display above each soft key (F1, F2 or F3) indicates the current function for that key. Press to select the indicated function.

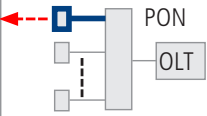
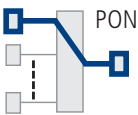

FLX380 Models

The FLX380 FlexTester is available in four models as indicated below:

AFL No.	Description
FLX380-100	1310/1550 OTDR with integrated 1310/1550 OLS, OPM and VFI
FLX380-102	1310/1490/1550 OTDR with integrated 1310/1490/1550 OLS, OPM and VFI
FLX380-103	1310/1550/1625 OTDR / Live PON OTDR with integrated 1310/1550 OLS, OPM, VFI, ServiceSafe™ live PON detection and PON Power Meter

FLX380 Setup

OTDR Modes

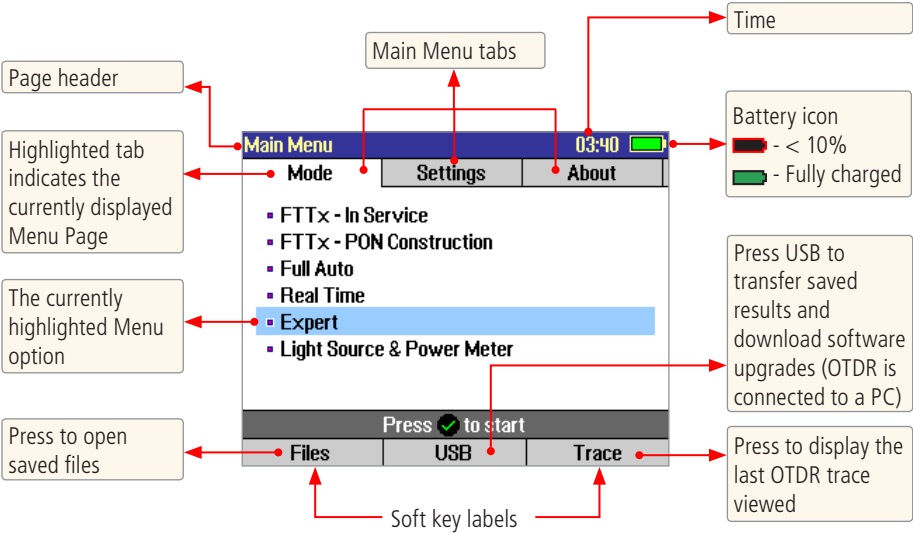
Test Mode	Network	Applications	Setup
FTTx – In Service		PON power meter Customer fiber fault location (fiber may be live or dark). Test live fibers through splitter.	Auto or Semi-Auto
FTTx – PON Construction		End-to-end loss Splitter loss Feeder fiber fault location	Semi-Auto
Full Auto	Long-haul Metro Access 	Fault location End-to-end loss Connection loss & reflection Splice loss	Auto
Real Time	Any	Short range fault location First connector check Fusion splice check Mechanical splice tuning	Semi-Auto
Expert	Any	For experienced users	Manual or Semi-auto

Light Source and Power Meter Mode


Test Mode	Application
SOURCE	Measure end-to-end loss or trace fibers using the tone feature and a NOYES Optical Fiber Identifier (OFI)
METER	Measure optical power or fiber loss

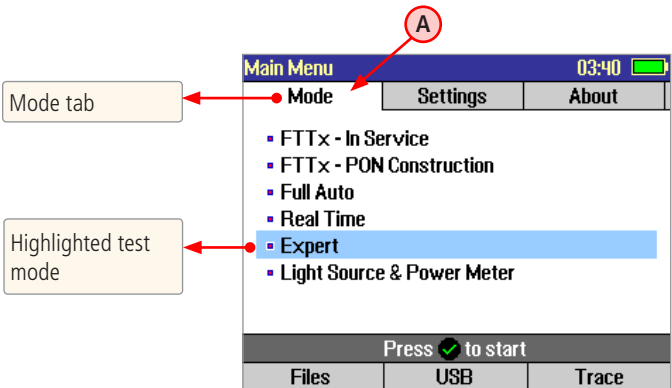
Main Menu

Main Menu - FLX380-103 model shown



Selecting a Test Mode

1. Press the Menu key to display the Main menu. The Mode menu page **A** is displayed by default.
2. Use ▲▼ keys to highlight the desired Test Mode.
3. Press the Select -  key to display a settings submenu for the highlighted Test Mode. From this submenu:
Use ▲▼ keys to highlight the desired setup parameter.
Use ◀▶ keys to set/change the highlighted parameter.



Understanding OTDR Test Parameters

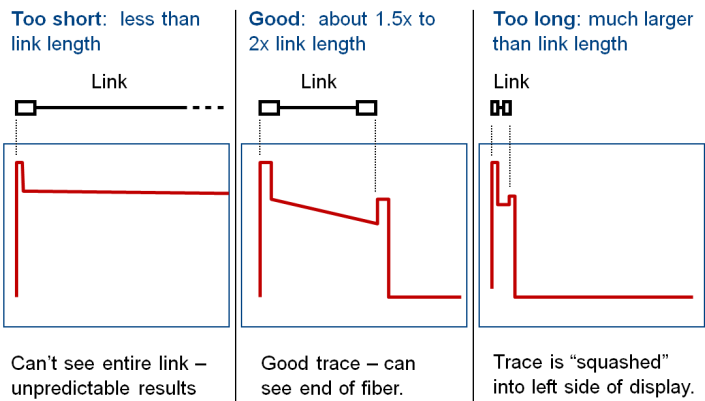
Parameter	Description
Range	The [Range] parameter determines the distance range of the full (unzoomed) trace. It also determines the distance between data points in the trace: the longer the range, the wider the data point spacing. We recommend selecting the shortest distance range that is longer than the fiber under test. For example, to test a fiber that is 1.5 km long, select the 3 km range. Available [Range] values: 250 m, 500 m, 1, 1.5, 3, 6, 15, 30, 60, 120, 240 km
Pulse	The FLX380 can operate using different pulse widths. Short pulse widths provide the shortest event and attenuation dead zones. Long pulse widths provide the range needed to test long fibers. Available [Pulse] values: 5, 10, 30, 100, 300 ns, 1, 3, 10 μ s.
Averaging	The [Averaging] parameter determines the duration of a timed test and the number of trace averages performed. The longer the test the smother the trace. Available [Averaging] values: 5, 10, 15, 30, 60, 90, 180 sec.
Resolution	Available: [Normal] or [High]. Set to [High] to see events that are close together; set to [Normal] for longer range.

Setting Test Parameters

Range

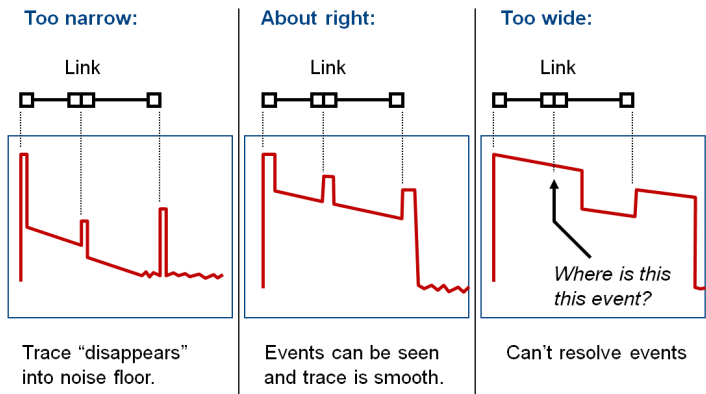
Range should normally be set to a value longer than the known length of the fiber under test. Shorter values may be used to obtain a higher resolution trace of the initial portion of the fiber. If you do not know the length of the fiber, start with a quick scan using a long range to determine where the fiber end is, then re-scan with a more appropriate range setting.

Note: The FLX380 automatically determines the appropriate Range setting In Full Auto and FTTx – In Service modes.



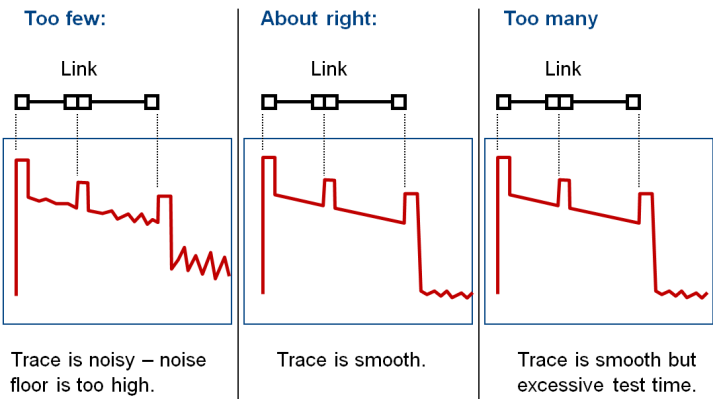
Pulse width

Narrow pulse widths provide better resolution. That is, they may be used to detect events which are close together. However, narrower pulse widths inject less optical energy into the fiber-under-test, resulting in a noisier trace (lower dynamic range). If a narrow pulse width is used on a long fiber, the trace may reach the noise floor before the end of the fiber is reached.



Averaging

Longer averaging times improve dynamic range and can be used to compensate for some of the range lost when selecting a narrow pulse width. However, tests take longer to complete.



Resolution

"Normal" resolution averages a higher number of traces than "High" resolution does in a given time frame by using a more coarse data-spacing. Events in the event table may be more precisely located using High resolution.

FTTx – In Service Test Mode Settings (FLX380-103 only)

In the FTTx – In Service mode (available only in the FLX380-103 model) the first page displays received FTTx PON power at 1490 and 1550 nm. On dark fibers users can test at 1310/1550 nm. On live fibers users can test only at 1625 nm.

FTTx - In Service

Downstream Power:

1490 nm Low dBm

1550 nm Low dBm

Dark Fiber

Press to start an OTDR test @1310/1550 nm

dBm/W

→OTDR

Freeze

FTTx - In Service

Downstream Power:

1490 nm -38.94 dBm

1550 nm -2.15 dBm

Live Fiber

Press to start an OTDR test @ 1625 nm

dBm/W

→OTDR

Freeze

Press to toggle display of power in dBm or Watts (mW, uW, nW)

Press to display OTDR Test Settings screen

[Freeze]/[Unfreeze] holds/resumes updating power readings continuously

In all other models, if users try to test a live fiber, a warning message is displayed and users are not allowed to continue the test.

- If a live fiber is detected, the 'Live Fiber' screen is displayed (OFL 280-103 only). Press the - Test key to continue testing at 1625 nm
- If a live fiber is not detected, an FLX380-103 OTDR will continue testing at the selected wavelengths.

FTTx – In Service OTDR Test Settings screen

FTTx - In Service

Test Event Fiber Cables

Wavelength 1310/1550/1625 nm

Test Through Splitter

PON 1x32

Press to start

Files

Power Meter←

Trace

FTTx - In Service

Test Event Fiber Cables

Wavelength 1310/1550/1625 nm

Test Customer Fiber Only

Press to start

Files

Power Meter←

Trace

Press to display PON power meter screen

This screen is used to configure FTTx – In Service to:

- test the customer drop fiber only
- or test through the splitter

When Test **[Through Splitter]** is selected, the user must specify the PON split ratio. Available PON split ratio settings are 1x8, 1x16, 1x32, and 1x64. If cascaded splitters are used and you wish to see through both, multiply together the larger numbers of the two cascaded splitters and use this value to select the PON split ratio.

Example: Cascaded 1x4 and 1x8: Multiply 4 and 8 = 32. Select PON split ratio of 1x32.

FTTx - PON Construction Test Mode Settings


In this test mode, the user may select the desired test wavelength(s) and set the [Range] and [PON] parameters.

From the Mode menu, display the FTTx - PON Construction page.

Use ▲▼ keys to highlight the desired test setup parameter to set.

Use ◀▶ keys to set/change the highlighted parameter.

- Use ◀▶ keys to select a single wavelength, dual or triple (if applicable) wavelengths.
- Use ◀▶ keys to set the [Range] parameter to a value that is greater than the longest end-to-end distance in the PON from central office to a customer.
- Use ◀▶ keys to set the [PON] parameter to a value that corresponds to the split ratio of the PON you are testing.
Notes: Pulse width and averaging time are automatically set based on Wavelength, Range, and PON split ratio. Wider pulse widths provide a smoother trace. Selecting a longer range or higher PON split ratio will result in a wider pulse width.


FTTx - PON Construction			
Test	Event	Fiber	Cables
Wavelength			1550/1625 nm
Range			30 km
PON			1x64
Press  to start			
Files			Trace

Full Auto Test Mode Settings

In this test mode, the user may select the desired test wavelength(s) while the [Range], [Pulse], [Averaging], and [Resolution] parameters are set by the FLX380.

- From the Mode menu, display the Full Auto page.
- Use ◀▶ keys to select a single wavelength or dual or triple (if applicable) wavelengths.

Use ◀▶ keys to select the desired single wavelength or dual and triple (if applicable) wavelengths.

Full Auto			
Test	Event	Fiber	Cables
Wavelength			1310/1550 nm
Press  to start			
Files			Trace

Real Time Test Mode Settings

In the Real Time test mode, the user may set the [Auto Setup] parameter to [Off] or [By Range].

- **[Off]:** Setting the [Auto Setup] parameter to [Off], allows the user to set the [Range], [Pulse], and [Resolution] parameters.
- **[By Range]:** Setting the [Auto Setup] option to [By Range], allows the user to set the [Range] and [Resolution] parameters while the [Pulse] parameter is set by FLX380.

1. From the Mode menu, display the Real Time page.
2. Use ▲▼ keys to highlight the desired setup parameter.
3. Use ◀▶ keys to set/change the highlighted parameter.

Set the desired single test wavelength.

If set to [By Range], set [Range] and [Resolution] while the FLX380 sets the [Pulse] parameter.

If set to [Off], set [Range], [Pulse], and [Resolution] parameters.

Real Time

Test	Fiber	Cables
Wavelength	1550 nm	
Auto Setup	By Range	
Range	500 m	
Pulse	30 ns	
Resolution	Normal	

Press to start

Files	Trace
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Expert Test Mode Settings

In the Expert test mode, the user may set the [Auto Setup] parameter to [Off] or [By Range].

- **[Off]:** Setting the [Auto Setup] parameter to [Off], allows the user to set the [Range], [Pulse], [Averaging], and [Resolution] parameters.
- **[By Range]:** Setting the [Auto Setup] option to [By Range], allows the user to set the [Range], [Averaging], and [Resolution] parameters while the [Pulse] parameter is set by the FLX380.

1. From the Mode menu, display the Expert mode page.
2. Use ▲▼ keys to highlight the desired test setup parameter.
3. Use ◀▶ keys to set/change the highlighted parameter.

Choose a single wavelength or dual or triple (if applicable) wavelengths.

If set to [By Range], set [Range], [Averaging], and [Resolution] while the FLX380 sets the [Pulse] parameter.

If set to [Off], set [Range], [Pulse], [Averaging], and [Resolution] parameters.

Expert

Test	Event	Fiber	Cables
Wavelength	1310/1550/1625 nm		
Auto Setup	By Range		
Range	120 km		
Pulse	3 us		
Averaging	60 sec		
Resolution	High		

Press to start

Files	Trace
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Event Threshold Settings

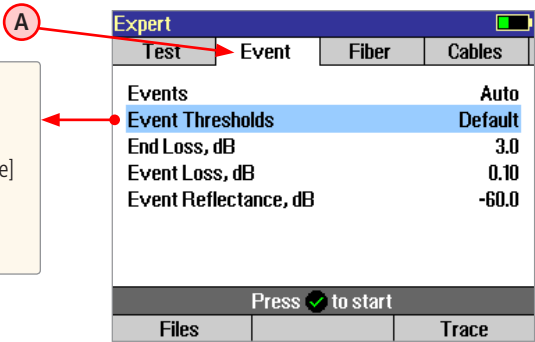
Event threshold settings may be modified in FTTx - In Service, FTTx - PON Construction, Full Auto, and Expert test modes.

Event Thresholds: FTTx – In Service mode

In the FTTx - In Service test mode the [Event] parameter is set to [Auto] by default.

- 1. From the FTTx - In Service test mode page, display the Event menu **A** using $\leftarrow \rightarrow$ keys .
- 2. Use $\blacktriangle \blacktriangledown$ keys to highlight the desired setup parameter.
- 3. Use $\blacktriangleleft \blacktriangleright$ keys to set/change the highlighted parameter.

This parameter may be set to:
[Default] - FLX380 sets [Event Loss] and [Event Reflectance].
[User] - [Event Loss] and [Event Reflectance] are set by the user. Allows the user to perform FTTx PON tests using manual settings.



Note: Event Loss and Reflectance threshold settings are used to determine whether or not a detected anomaly should be reported as an event and included in the event table, and if so how it should be classified by event type (e.g. as a reflective or non-reflective event).

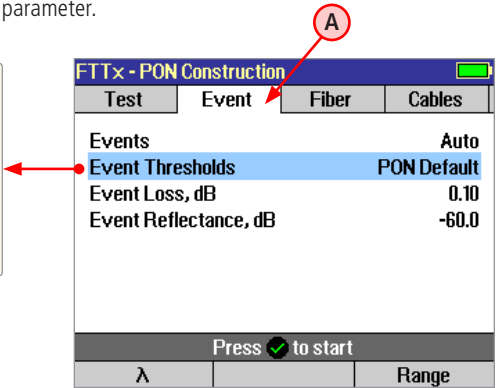
Types of events are described in section titled "Event Types".

Event Thresholds: FTTx – PON Construction mode

In FTTx – PON Construction mode, the [Events] parameter is set to [Auto] by default and may not be disabled.

- 1. From the FTTx - PON Construction test mode page, display the Event menu **A** using $\leftarrow \rightarrow$ keys.
- 2. Use $\blacktriangle \blacktriangledown$ keys to highlight the desired setup parameter.
- 3. Use $\blacktriangleleft \blacktriangleright$ keys to set/change the highlighted parameter.

This parameter may be set to
[PON Default] - OFL 280 sets [Event Loss] and [Event Reflectance].
[PON User] - [Event Loss] and [Event Reflectance] are set by the user. Allows the user to perform FTTx PON tests using manual settings.



Event Thresholds: Full Auto mode

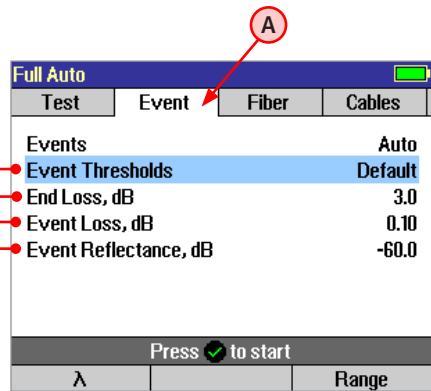
In Full Auto mode, the [Events] parameter may be set to [Auto] or [Off]. When set to [Auto], automatic event detection is enabled, applying user-set End Loss, Event Loss, and Event Reflectance thresholds. Thresholds are adjusted as follows:

- 1. From the Full Auto test mode page, display the Event menu **A** using $\leftarrow \rightarrow$ keys.
- 2. Use $\blacktriangle \blacktriangledown$ keys to highlight the desired setup parameter.
- 3. Use $\blacktriangleleft \blacktriangleright$ keys to set/change the highlighted parameter.

This parameter may be set to [Default] - OFL 280 sets [Event Loss] and [Event Reflectance].
[User] - [Event Loss] and [Event Reflectance] are set by the user.

Automatic event analysis declares the fiber end at the first event with event loss exceeding the End Loss threshold.

A detected event is reported in the event table (see section titled 'Event Types') if either:
the measured event loss exceeds the Event Loss threshold, or
the measured event reflectance exceeds the Event Reflectance threshold.

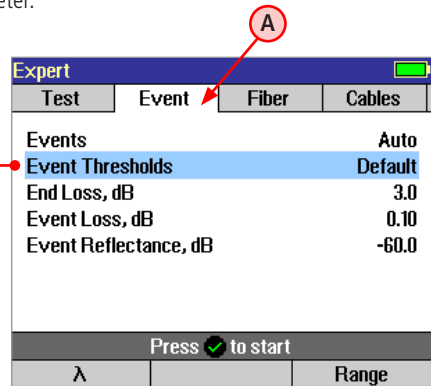


Event Thresholds: Expert mode

In Expert mode, the [Events] parameter may be set to [Auto] or [Off]. When set to [Auto], automatic event detection is enabled, applying user-set End Loss, Event Loss, and Event Reflectance thresholds. Thresholds are adjusted as follows:

- From the Expert test mode page, display the Event menu **A** using $\leftarrow \rightarrow$ keys.
- 1. Use $\blacktriangle \blacktriangledown$ keys to highlight the desired setup parameter.
 - 2. Use $\blacktriangleleft \blacktriangleright$ keys to set/change the highlighted parameter.

This parameter may be set to [Default] - OFL 280 sets [Event Loss] and [Event Reflectance].
[User] - [Event Loss] and [Event Reflectance] are set by the user.
[PON Default] - OFL 280 sets [Event Loss] and [Event Reflectance]. Allows the user to perform FTTx PON tests using default settings.
[PON User] - [Event Loss] and [Event Reflectance] are set by the user. Allows the user to perform FTTx PON tests using manual settings.



Fiber Menu Settings








The Fiber menu page allows selecting the Fiber Type between default - [SMF-28e] and [User]


- [SMF-28e] - sets the default Index (Group Index of Refraction) and BC (Backscatter Coefficient) values to those of SMF-28e type fiber
- [User] - allows entering user selectable Index (Group Index of Refraction) and BC (Backscatter Coefficient) values

Notes:

- Using the default Index and BC values is generally recommended.
- Enter the [User] Index and BC values only if you know the specifications of the particular fiber you are testing and these specifications are significantly different from the default SMF-28e numbers.

To Set Fiber Parameters

1. From the current OTDR test mode menu, use   keys to display the Fiber menu page .
2. Use   keys to highlight the desired parameter to set.
3. Use   keys to change the highlighted parameter.

Expert			
Test	Event	Fiber	Cables
Fiber Type		SMF-28e	
Index @1310		1.4677	
BC @1310, dB		-79.6	
Index @1550		1.4682	
BC @1550, dB		-82.0	
Index @1625		1.4690	
BC @1625, dB		-83.0	
Press  to start			
λ		Range	

Cables Menu Settings

Note: Launch and Receive cables are required to measure the insertion loss and reflectance of the near-end and far-end connectors respectively, on the fiber link being tested. See section titled "Recommended Accessories" for details and recommended launch and receive cable lengths.

Launch Cable (Launch Cord) - A test cable used to connect an OTDR to the near end of the link under test. To accurately measure the loss of the first connection to the fiber-under-test, determine the widest pulse width you expect to use (in ns), divide this by 10 ns/m to convert pulse width to its equivalent fiber length, then multiply by 3 to determine the minimum recommended launch fiber length.

Receive Cable (Tail Cord) - A test cable used to terminate the far end of the link under test. To accurately measure the loss of the last connection, use a receive cable at least as long as the recommended launch cable length.

To set Launch/Receive Cable parameter:

1. From the current OTDR test mode menu, use $\leftarrow \rightarrow$ keys to display the Cables menu page **A**.
2. Use $\blacktriangle \blacktriangledown$ keys to highlight the desired setup parameter.
3. Use $\blacktriangleleft \blacktriangleright$ keys to set/change the highlighted parameter.

This parameter may be set to None
Default 1: 150 m fiber ring
Default 2: 500 m fiber ring
Default 3: 1000 m fiber ring
Default 4: 2000 m fiber ring
User: Adjust Launch / Receive Length parameter to match the length of the user-provided launch and/or receive cable(s)

Test	Event	Fiber	Cables
Launch Cable			User
Launch Length			100.0 m
Receive Cable			Default 1
Receive Length			150.0 m

Press to start

λ		Range
-----------	--	-------

General Settings

The General Settings page contains [Language], [Date & Time], and [Distance] settings.

- [Language] - allows selecting a language from a list of available languages
- [Date & Time] - provides time & date setup functions
- [Distance Units] - distance units of measurement setting impact how new and saved traces are displayed. Changes made to distance units will impact currently viewed results and future tests.

1. From the Main menu, display the Settings page **A** using $\leftarrow \rightarrow$ keys.
2. Using use $\blacktriangle \blacktriangledown$ keys navigate up/down the list to highlight the desired setup parameter.

Press to display submenu
Use $\blacktriangle \blacktriangledown$ to highlight the desired language
Press Set or when done

Press to display submenu
Use $\blacktriangle \blacktriangledown$ to highlight the desired setup parameter
Use $\blacktriangleleft \blacktriangleright$ keys to set/change date/time
Press Set when done

Use $\blacktriangleleft \blacktriangleright$ keys to change units

Main Menu		20:31
Mode	Settings	About
Language...		
Date & Time...		
Distance Units		Kilometers

Press to start

Files	USB	Trace
-------	-----	-------

Light Source and Power Meter Settings

Light Source Operation

After enabling the Light Source & Optical Power Meter test mode or turning the [Laser] option On, let the laser stabilize for approximately five minutes.

- 1. Use ▲▼ keys to highlight the desired light source setup parameter.
- 2. Use ◀▶ keys to change the highlighted parameter.

Turn the current light source laser on or off.

Set up the light source for CW (continuous wave), 1 kHz, 2 kHz, 270 Hz, or 330 Hz tone, or Wave ID operation.

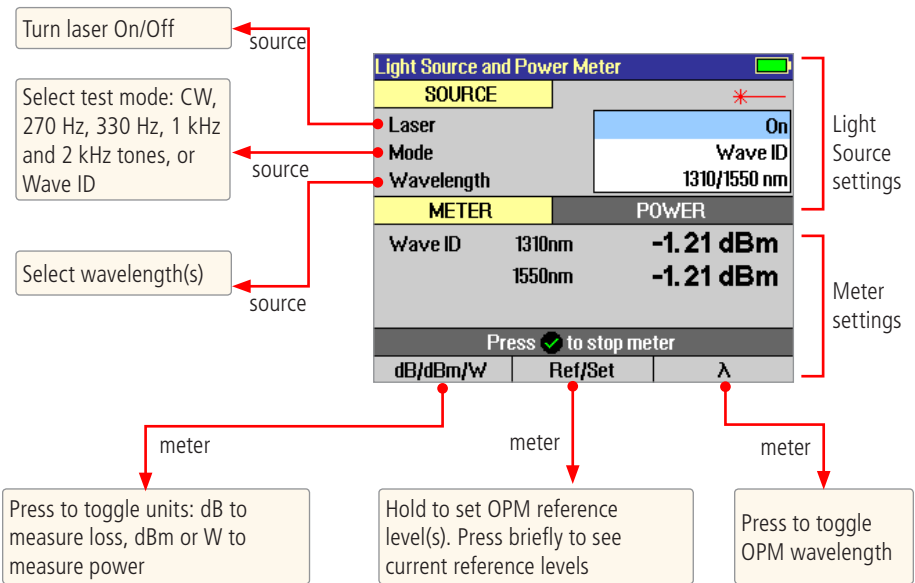
Set up the light source for the desired wavelength operation.

Optical Power Meter Operation

- 1. Press the [Ref/Set] soft key to see the Reference value (in dBm) for several seconds, then display will return to dB mode.
- 2. To set a new OPM reference level, hold the [Ref/Set] key until you see REFERENCE [SAVED]. This takes about one second.
- 3. When you release the [Ref/Set] soft key, the unit should display a loss value of about 0.0 dB.
- 4. You can sample and hold live POWER or LOSS readings by pressing the Test key. While a held value is shown you will see POWER [STOPPED] or LOSS [STOPPED].
- 5. Press the Test key again to return to the live data view.

Use ▲▼ to navigate source menu

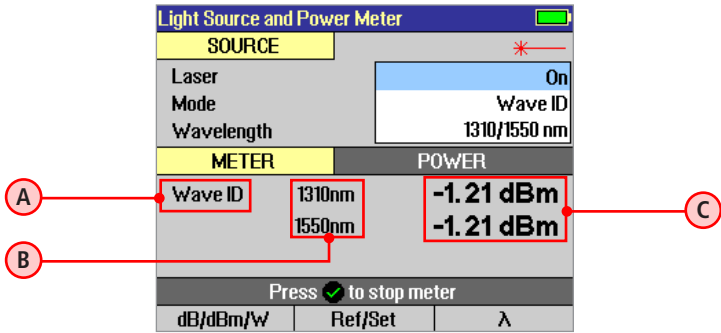
Use ◀▶ to change source menu items



Wave ID Mode Feature

Wave ID is a powerful feature which cuts multi-wavelength testing time in half and eliminates user setup errors.

1. When Wave ID is enabled in the Source, each wavelength is transmitted with a wavelength indicator. A Wave ID-compatible Power Meter will detect and synchronize its wavelength calibration factor to the transmitted wavelength, eliminating the need for the user at the Source fiber end from having to call the user at the Power Meter fiber end to tell him/her which wavelength is being sent.
2. When Wave ID is enabled with 1310/1550 or 1310/1490/1550 (FLX380-102 only) selected, the Source alternately sends each wavelength with its wavelength indicator. A Wave ID-compatible Power Meter detects and synchronizes to each wavelength in turn, enabling simultaneous, multi-wavelength measurements, cutting test time in half or more, eliminating the need for Source and Power Meter users to coordinate their wavelength settings, and avoiding measurement errors due to mismatched Source and Power Meter wavelength settings.
3. When Ref Set is pressed and held in Wave ID mode, references are set at each of the Wave ID wavelengths.



- A** **Modulation indicator** automatically detects and reports modulation on the received optical signal, as follows:
- Wave ID:** Indicates single or multi-wavelength Wave ID signal received. The displayed wavelength(s) are determined from the received Wave ID signal.
 - 270 Hz:** Indicates received optical signal is a 270 Hz fiber-identifying tone.
 - 330 Hz:** Indicates received optical signal is a 330 Hz fiber-identifying tone.
 - 1 kHz:** Indicates received optical signal is a 1 kHz fiber-identifying tone.
 - 2 kHz:** Indicates received optical signal is a 1 kHz fiber-identifying tone.
 - Blank:** Received optical signal is live traffic or an unrecognized test signal
- B** **Wavelength**
Wave ID detected or user-selected Power Meter wavelength calibration factor. When Wave ID is detected, the user may not change the wavelength value
- C** **Power or Loss Measurement**
Displays measured power in dBm or Watts, or displays loss relative to the previously set reference level. When the Power Meter detects multi-wavelength Wave ID, wavelength and measured power or loss is displayed simultaneously at each of the received wavelengths.

Trace Page Features

The illustration below and table on the next page describe the Trace Page features (example trace below includes a launch and receive cable).

Trace Page displays OTDR trace, A/B cursors, Loss, Distance, and max reflectance between A and B cursors

File name (cable name + fiber number), or "New Trace" if file has not been saved

Test Wavelengths (RED is current)

Grid units display dB/div on vertical axis and distance/div on horizontal axis

Event Table displays OTDR event measurements

Summary Page displays end-to-end link measurements

Information Page displays OTDR setup parameters, launch and receive cable data, and event thresholds

C001-001

1310 1550 1625

13.1 dB, 510 m /div

A	-0.0434	B	1.6698	A→B	1.7132	km
Reflectance			-51.403	Loss	1.044	dB
Wave		<input type="checkbox"/> Zoom		Rezoom		

Fiber under test

Launch cable
Note: this region is only present if the network was defined (in the Cables page) to include a Launch cable. The width of the shaded region is based on the length of the launch cable specified in the Cables page.

A and B cursors

Trace graph (RED is current)

Receive cable
Note: this region is only present if the network was defined (in the Cables page) to include a Receive cable. The width of the shaded receive region is based on the length of the receive cable specified in the Cables page.

Soft key labels

C001-002

1310 1550 1625

6.5 dB, 510 m /div

A	0.0006	B	1.5223	A→B	1.5217	km
Reflectance			-52.584	Loss	1.496	dB
Wave		<input checked="" type="checkbox"/> Zoom		Unzoom		

B cursor location (active cursor is highlighted)

A cursor location

Maximum Reflectance between A and B cursor

For multi-wavelength tests, press to toggle active trace

Distance between A and B cursor

2-point Loss between A and B cursor

Press to Unzoom or Rezoom

Press to toggle Zoom and Move mode. In Move mode, the key label will be displayed as [☐ Zoom]. In Zoom mode, the key label will be displayed as [☒ Zoom]

C001-002

1310 1550 1625

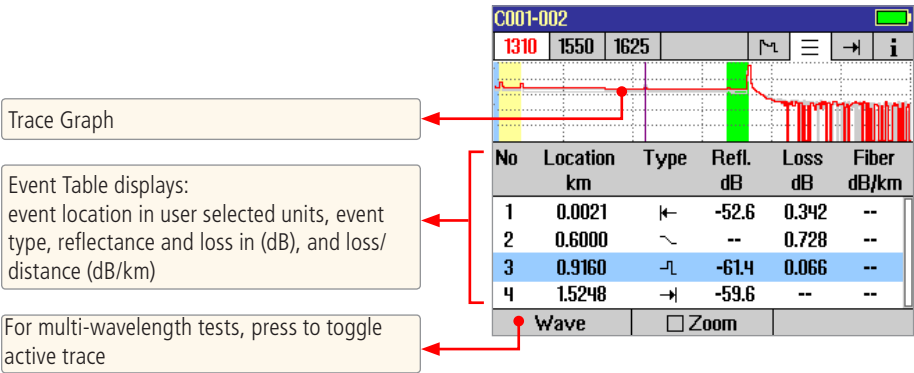
6.5 dB, 510 m /div

A	0.0006	B	1.5223	A→B	1.5217	km
Reflectance			-52.584	Loss	1.496	dB
Wave		<input checked="" type="checkbox"/> Zoom		Unzoom		

Event Table Page Features

Event Table is always generated if testing in the FTTx - In Service or FTTx - PON Construction test mode and optionally generated if testing in the Full Auto or Expert test mode.

1. In the FTTx - In Service and FTTx - PON Construction modes, [Events] are set to [Auto] by default.
2. In the Full Auto and Expert modes, set Events to [Auto].



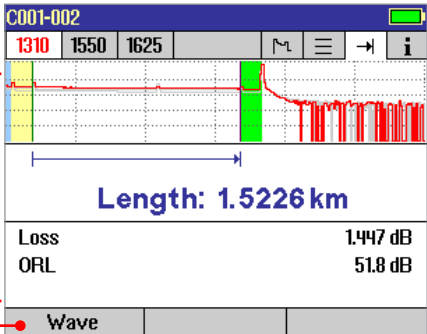
Event Types

Icon	Event Type	Description
←	Start	The start of the fiber under test.
→	End	The end of the fiber under test.
↘	Reflective Event	An event with measurable loss and reflectance, typically caused by a connection or mechanical splice.
↘	Non-Reflective Event	An event with measurable loss but very small or unmeasurable reflectance, typically caused by a fusion splice, PON splitter, or sharp bend in the fiber.
↘	Gainer	An event with 'negative loss,' which can occur in OTDR traces where two fibers with very different backscatter coefficients are spliced or connected. Normally a gainer will be seen as a normal (positive loss) event when tested from the other end of the fiber. The true loss of the event causing the gainer is approximately equal to the average of its loss measured from each end of the fiber under test.
	Multiple Event	An event table entry that accounts for two or more physical (real) events that are too close together to be measured separately by the OTDR, for example the start and end of a short jumper. The loss of a multiple event is the sum of the losses of the physical events that comprise it.

Summary Page Features

Summary page displays:
trace graph, fiber under test [Length] in user
selected units, [Loss] and [ORL] in (dB)

For multiple-wavelength tests, press to toggle
the wavelength and display [Length], [Loss]
and [ORL] test results for that wavelength



Information Page Features

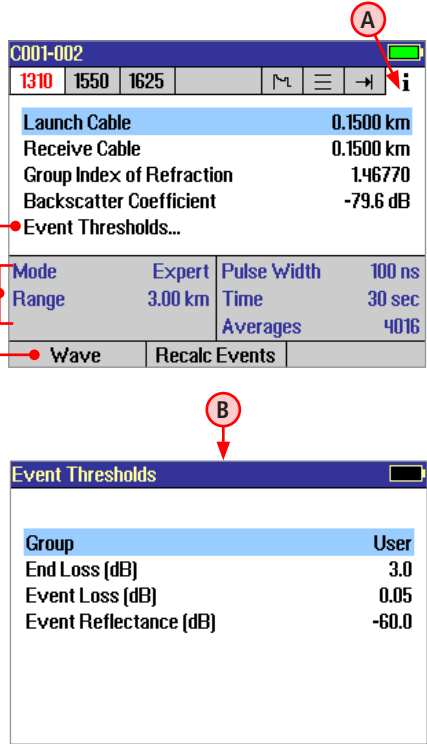
The information page displays how the test was created.

- From the test viewer, use $\leftarrow \rightarrow$ keys to display Information page **A**.
- Use $\blacktriangle \blacktriangledown$ keys to highlight the desired setup parameter.
- Use $\blacktriangleleft \blacktriangleright$ keys to change the highlighted setup parameter (except [Event Thresholds...] parameter. You may change these parameters to correct locations in the Event Table after the test is complete
- When done, press [Recalc Events] to recalculate the Event Table.

- Press \odot key to display submenu **B**
- Use $\blacktriangle \blacktriangledown$ keys to highlight the desired parameter
- Use $\blacktriangleleft \blacktriangleright$ keys to change the highlighted parameter
- When done, press [Recalc Events] to recalculate the Event Table

These fields show the current test data

For multiple wavelengths tests, press to toggle
the wavelength and display setup
conditions for that wavelength





Running OTDR Tests and Viewing Results

To Start a Test

- Press the  - Test key.

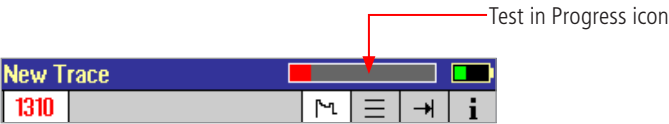
Note: After an OTDR test is started, it may take several seconds for the first results to appear and depending on setup, tens of seconds or even several minutes for tests to complete.

To Stop a Test

- Press the  - Test key. If pressed after a trace appears, it will stop the test, generate the event table (see Section titled Event Types) and show the partially completed trace.
- Press the  Back key. The FLX380 stops the test and displays the setup menu.







How can I tell if a test is running?

The FLX380 Page header will display the Test in Progress icon.



To display the desired Page for viewing, use Left and Right Tab keys 

Test Viewer Pages Description

Icon	Name	Description
	Trace	Displays OTDR trace, A/B cursors, Loss and Distance between A and B cursors, and max reflectance between A and B locations.
	Event	Displays OTDR trace and for each detected event: location (in current distance units), type, reflectance (dB), and insertion loss (dB). Press   to jump to next / previous event.
	Summary	Displays end-to-end link summary (length, loss, and ORL).
	Information	Displays test settings, test cable lengths, fiber parameters, and event thresholds.

Saving and Reviewing Test Results

File Manager System

The FLX380 File Manager system consists of four pages as follows:

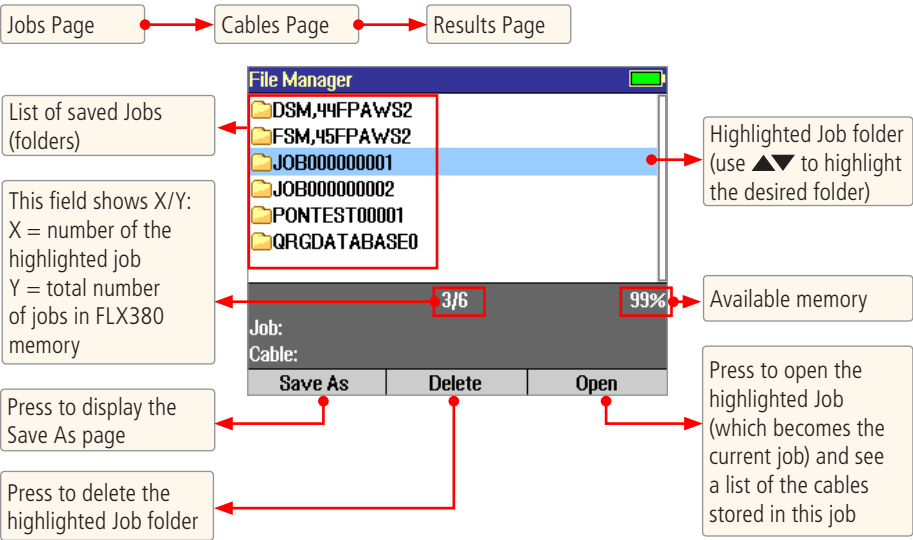
Page Name	Description
Jobs	Lists the Jobs (folders) stored in the FLX380 internal memory. Use to open or delete the highlighted job folder.
Cables	Lists the Cables (folders) in the currently open Job folder. Use to open or delete the highlighted cable folder.
Results	Lists the OTDR trace (.SOR) files and OPM results (.ATD) files in the currently open Cable folder. Use to open (view) or delete the highlighted results file.
Save As	Lists the current job, the current cable, and the fiber number that will be used the next time a group of traces is saved. Use to save the 'new' results created by the most recent test, or the results most recently opened (recalled from memory).

To display File Manager, press the [Files] soft key on the Main Menu page or when it appears.

File Manager – Jobs Page




Depending on the prior settings, the File Manager may be displayed as [Jobs], [Cables], or [Results] page. To display [Jobs] page (top level menu page in the FLX380 File Manager):

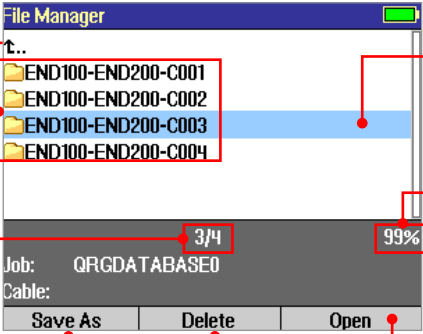
- Press the [Files] soft key.
- If the [Cables]/[Results] page is displayed, highlight the (⬆ ⬇) symbol at the top of the [Cables]/[Results] page.
- Press the [Select] soft key - (●) to display [Jobs] page.






File Manager – Cables Page

Depending on the prior settings, the File Manager may be displayed as [Jobs], [Cables], or [Results] page. To display [Cables] page perform the following.

- Press the [Files] soft key.
- If the [Jobs] page is displayed, highlight the desired job, and then press [Select] -  to display the [Cables] page.
- If the [Results] page is displayed, highlight the ( ..) symbol at the top of the [Results] page, and then press [Select] -  to display the [Cables] page.



The screenshot shows the File Manager interface with the following elements and callouts:

- Select ( ..) to return to Jobs page**: Points to the top navigation bar.
- List of saved Cables (folders)**: Points to the list of cable folders.
- This field shows X/Y: X = number of the highlighted cable Y = total number of cables in the current job**: Points to the "3/4" indicator.
- Press to display the Save As page**: Points to the "Save As" button.
- Press to delete the highlighted Cable folder**: Points to the "Delete" button.
- Highlighted Cable folder (use   to highlight the desired folder)**: Points to the highlighted "END100-END200-C003" folder.
- Free space (internal memory)**: Points to the "99%" indicator.
- Press to open the highlighted cable (which becomes the current cable) and see a list of trace (.SOR) and OPM (.ATD) files stored for this cable**: Points to the "Open" button.

File Manager – Results Page

Depending on the prior settings, the File Manager may be displayed as [Jobs], [Cables] or [Results] page.

- Press the [Files] soft key.
- If the [Jobs] page is displayed, highlight the desired job, and then press [Select] - ● to display the [Cables] page.
- From the [Cables] page, highlight the desired cable, and then press [Select] - ● to display the results files for the selected cable.

The screenshot shows the File Manager interface with the following elements and callouts:

- Top Bar:** Labeled "File Manager" with a battery status icon.
- Navigation:** A button labeled "t.." is highlighted with a callout: "Select (▲..) to return to the Cables page".
- File List:** A list of files is shown, with "END100-END200_001_S15" highlighted in blue. A callout points to this list: "List of saved results (OTDR .SOR files and OPM .ATD files)". Another callout points to the highlighted file: "Highlighted results (use ▲▼ to highlight the desired folder)".
- Summary:** Below the list, it shows "3/6" (highlighted with a callout: "This field shows X/Y: X = number of the highlighted results file Y = total number of results files in the current cable") and "99%" (highlighted with a callout: "Free space (internal memory)").
- Metadata:** It displays "Job: QRGDATABASE" and "Cable: END100-END200-C001".
- Actions:** Three buttons are at the bottom: "Save As", "Delete", and "Open".
 - "Save As" is highlighted with a callout: "Press to display the Save As page".
 - "Delete" is highlighted with a callout: "Press to delete the highlighted trace or OPM results file".
 - "Open" is highlighted with a callout: "Press to open the highlighted trace or OPM result. Opening the selected trace file will open traces for all wavelengths having the same fiber number."

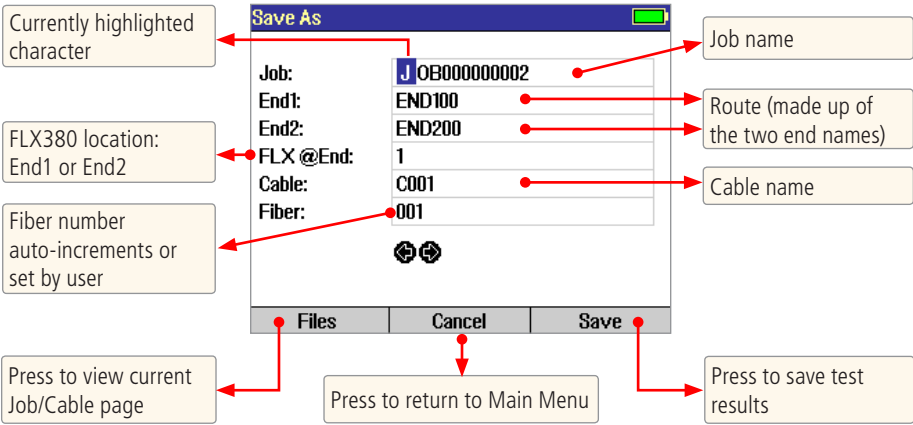
File Manager – Save As Page

The [Save As] page allows the user to save current test results and create new Jobs/Cables as needed. This page allows the user to review and change test IDs each time test results are saved.

To save test results

1. Display the [Save As] page by pressing the [Save] key or the [Save As] soft key when it appears.
2. When the [Save As] page is displayed, edit Job, End1, End2, Cable ID and Fiber number as needed:
 - Use ◀▶ keys to highlight any character position within the Job/End1/End2/Cable name fields and Fiber number field.
 - Use ▲▼ keys to change the highlighted character.
 - Use the ⇐⇒ keys to select the previous or next field.
3. If the Folder name is edited to a name that already exists, then pressing the [Save] (soft or hard) key will save the current test results in this folder and make this folder current.
4. If the Job/End1/End2/Cable name and Fiber number are edited to the name and number that already exist in the current folder, then pressing the [Save] key will cause the FLX380 to display "Overwrite file?".
5. If the Job/End1/End2/Cable name is edited to a new name, then pressing the [Save] key will cause the FLX380 to create a new folder of this name.
6. When done, press the [Save] soft key.

Note: This is the only way to create new folders!



Creating New Cables (folders) Using the Save As Page

New Folders are created in the File Manager - [Save As] page.
See section above 'File Manager - Save As Page'.

Selecting a Cable as the Current Cable (folder)

1. Access the File Manager - [Cables] page.
2. Use ▲▼ keys to highlight the desired cable.
3. Press either [Select] key or [Open] soft key to make the highlighted cable current.

Saving Test Results

Test results are stored on the FLX380 Internal Drive. Saved test results can be viewed, printed and analyzed on a PC using TRM® (Test Results Manager) software supplied with the FLX380.

- OTDR results are saved as industry standard .SOR files
- OPM Results are saved in .ATD file format and may be merged with OTDR results using TRM.

Save Results to an Existing Job/Cable

To save the currently displayed test results to an existing job/cable, perform the following steps:

1. Once a test is complete, press the [Save] key. The [Save As] page will be displayed.
2. From the displayed [Save As] page, press the [Save] key to save test results with the currently displayed Job/End1/End2/Cable name and Fiber number.

Saving Results to a New Job/Cable

To save test results to a new job/cable, use the File Manager - [Save As] page.

1. Once a test is complete, press the [Save] key to display the [Save As] page.
2. As needed, edit Job/End1/End2/Cable name and Fiber number as described in the section titled 'File Manager - Save As Page'.
3. When done, press either soft or hard [Save] key.

Opening Files (Reviewing Saved Results)

1. Access the File Manager - [Files] page by pressing the [Files - F1] soft key.
2. Use ▲▼ keys to highlight the desired file.
 - OPM results are labeled with "OPM" icon
 - OTDR results are labeled with "OTDR" icon
3. Press the [Open - F3] soft key to display test results.

Deleting Jobs/Cables/Results

1. Access the File Manager.
2. Use ▲▼ keys to highlight the desired job/cable/results file.
3. Press the [Delete] soft key to delete the highlighted job/cable/results file.

Transferring Files to a PC via USB

To transfer files from your FLX380 to a PC using a USB cable, perform the following:

1. Connect your FLX380 to a PC using the supplied mini-USB to USB cable. Make sure the mini-plug is fully seated in your FLX380.
2. Press the USB soft key on the FLX380's main menu.
3. On your PC, open My Computer. A new removable drive named [OFL X:] will appear, where 'X:' is the drive letter assigned to your FLX380.
4. Under [OFL X:] you should see two folders: [RESULTS] and [SOFTWARE].
5. Copy the [RESULTS] folder to your PC.
6. Under [RESULTS] you will see: [TRACES]
7. Under [TRACES] you will see all of the folders containing OTDR traces or OPM results.

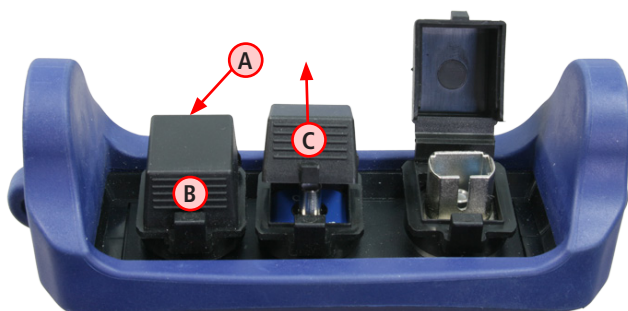
Note:

Before removing the USB cable connecting your FLX380 to your PC, or pressing the [Cancel] soft key on the USB page, left click the Safely Remove Hardware icon in the Start bar of your PC, then left click the [Safely remove USB Mass Storage Device – Drive (X:)] message, where 'X' is the drive letter assigned to your FLX380.

Maintenance Tips

Dust Caps

To open dust cap



- Place your middle finger on the back side of the dust cap you need to open - **A**.
- Place your thumb in the middle section of the dust cap front - **B**.
- Press your thumb in upward direction to open the dust cap - **C**.

Caution: do not twist the dust cover trying to open it: this will make an adapter to come loose. Verify that connector adapter is tight.

Clean Test Cables and Fiber-under-Test (FUT)

It is important to keep connector end-faces on the launch and receive cables and those on the Fiber Under Test (FUT) clean, to ensure accurate measurements and operation.

IMPORTANT! Inspect optical connectors after cleaning to ensure cleaning was successful and to verify the end-face is not damaged (cracked, pitted, etc.).

CAUTION! Never view a live fiber. Laser radiation is harmful to eyes.

Follow your company's approved cleaning procedures.

Clean Optical Ports

CAUTION! Before conducting the following procedures be sure to have the OTDR turned OFF.

Cleaning the OTDR/OLS and VFL optical ports without removing adapters

AFL One-Click Cleaner method

- Remove the protective dust cover from the tip of the One-Click Cleaner.
- Insert the tip of the One-Click Cleaner into the optical port adapter and gently press the body of the One-Click Cleaner until an audible "click" is heard.
- Remove the One-Click Cleaner.

AFL FCC2 fluid and CCT stick method

- Lean a can of FCC2 back (30°), press the button on FCC2 to fill the well.
- Dip a CCT stick into the well of the FCC2 to dampen the tip with optical cleaning fluid.
- Place the damp tip over the ferrule to be cleaned.
- Rotate the tip clockwise 10 revolutions while applying varying pressure to create a gentle pumping action where the tip contacts the ferrule.
- Discard the CCT stick after using both tips.

Cleaning the optical ports with adapters removed

To access the OTDR Port

- Rotate the adapter base counterclockwise approximately four times.
- Pull the adapter directly out away from the universal adapter mount to expose the ferrule.

To access the VFL Port

- Unscrew the adapter counterclockwise and pull the adapter straight out to expose the ferrule.

To access the OPM Port

- Unscrew the adapter cap from the adapter cap mount.

Cleaning the Exposed Ferrule or the OPM port

Use lint-free optical cleaning wipes such as AFL FiberWipes and optical quality cleaning fluid such as AFL FCC2 connector cleaning fluid.

Note: if using isopropyl alcohol (IPA), be sure to use 99% pure IPA that has not been contaminated.

8. Dampen a portion of the wipe with the cleaning fluid.
9. Gently wipe the exposed ferrule (OPM port) starting with the wet section of the wipe and pulling it to the dry section.

Note: Starting with the wet cleaning and finishing in the dry improves cleaning action, reduces static buildup, and finishes with the end-face dry.

Cleaning the adapters

Method 1:

1. Insert a Cletop adapter cleaning stick into the sleeve of the adapter and rotate 10 times.
2. Remove.
3. After cleaning the adapter, replace the adapter over the ferrule; centering it onto the alignment pin.
4. Tighten the adapter base.

Method 2:

1. Use a can of filtered compressed air (held vertically), blow out any contaminants from the adapter.
2. After cleaning the adapter, replace the adapter over the ferrule; centering it onto the alignment pin.
3. Tighten the adapter base.

Recharging Batteries

You may charge the batteries while the FLX380 is switched on or off by attaching an AC power adapter.

- Plug the AC adapter/charger into a standard wall outlet.
- Connect the AC adapter/charger to the Power port located on the FLX380 side panel.
- The [AC/Charger] indicator on the side panel will turn on - Red.
- Charge batteries until the [AC/Charger] indicator turns Green.

Repair and Calibration

Prepaid Calibration Plans

AFL recommends annual calibrations on NOYES Test and Inspection products. ISO certification also requires calibrations. Annual calibrations performed at NOYES calibration facilities ensure that you are getting the most out of your test equipment and that your equipment is operating at NOYES specifications.

Cal Plans

Cal plans save you money by offering two annual calibrations at a discounted price. In addition to the annual calibrations, Cal plans offer a convenient calibration expiration email service that notifies you when your equipment is due for calibration. Express calibration services get your equipment back to you quickly to minimize downtime. Prepaid Cal plans include access to the NOYES product knowledge base, which gives you access to white papers and answers to frequently asked questions. Get additional savings with access to preferred customer promotions on NOYES products.

Cal Plus Plans

Cal Plus plans offer the same services as the Cal plans with the addition of a two year extended warranty. If your test equipment is found defective NOYES will repair or replace your test equipment at no additional charge. All repairs are done with genuine NOYES specified parts by a trained NOYES repair technician. Save money with free return shipping from the repair facility back to you on all extended warranty repairs. Also, save money with free replacement of worn accessories (limited to adapter caps, power cords and batteries).

Please contact customer service for a return authorization number prior to sending your NOYES test equipment in for repair or calibration.

USA Repair and Calibration services

Please contact NOYES customer service for a return authorization number prior to sending your NOYES test equipment in for repair or calibration.

AFL, NOYES Test and Inspection Division
16 Eastgate Park Road
Belmont, NH 03220
603-528-7780 or 800-321-5298

Europe Repair and Calibration services

Fujikura Europe Ltd. is an Authorized European Repair and Calibration facility for NOYES Test and Inspection products from AFL and should be contacted directly for service.

Fujikura Europe Ltd.
C51 Barwell Business Park
Leatherhead Road
Chessington, Surrey, KT9 2NY
+44 (0) 208 240 2020

How to View Version Information

From the Main Menu, use [↵ ⇌] keys to open the [About...] menu and display the FLX380 software version number.

Note: It is helpful to have the FLX380 version number if you need to contact NOYES Customer Service or Technical Support.

Warranty

Warranty Terms and Conditions

All NOYES Test and Inspection products are warranted against defective material and workmanship for a period of (1) one year from the date of delivery to the end user. Extended Warranty starts at the end of the standard (1) one year warranty period. Any product that is found defective within the warranty period, will (at the discretion of NOYES) be repaired or replaced. Warranty will be voided if the product has been repaired or altered by other than an authorized NOYES repair facility or which have been subject to misuse, negligence, or accident. In no case shall NOYES liabilities exceed the original purchase price.

Standards Compliance Information

The FLX380 has been designed and tested to comply with the relevant sections of any applicable specifications including full compliance with all essential requirements of the applicable EU Directives.

Returning Equipment

To return equipment, please contact NOYES to obtain additional information and a Service Request (S.R.) number. To allow us to serve you more efficiently, please include a brief description specifying the reasons for the return of the equipment.

AFL, NOYES Test and Inspection Division
16 Eastgate Park Road
Belmont, NH 03220
800-321-5298 or 603-528-7780

Thank you for choosing NOYES Test and Inspection

