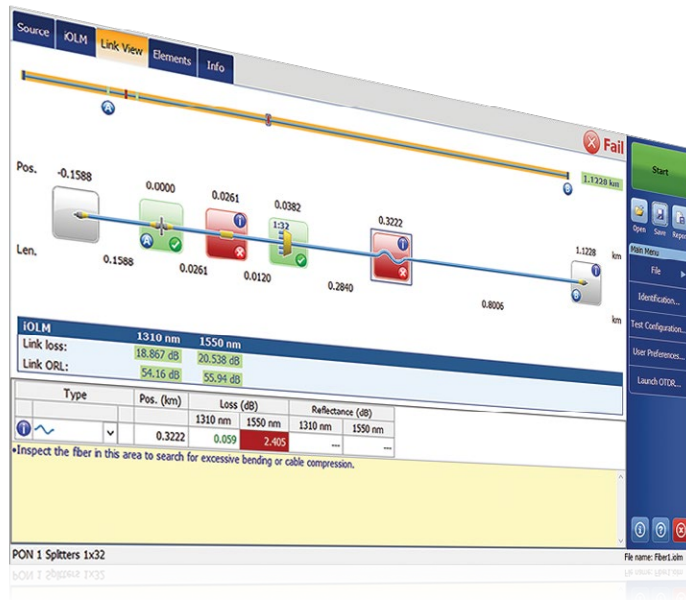


intelligent Optical Link Mapper (iOLM)

OTDR-BASED APPLICATION MAKING EXPERT-LEVEL FIBER TESTING ACCESSIBLE TO ALL



- Simplify OTDR tests while optimizing characterization accuracy for all network topologies. iOLM is powered by intelligent algorithms that can adapt to the context. Still unmatched in the industry, iOLM dynamically locates and identifies all network components and faults with maximal resolution—all at the push of one button.

Powered by
LINK AWARE
TECHNOLOGY



Available on:

- MaxTester 700B/C OTDR Series
- FTBx-700C OTDR Series
- FTB-7000e OTDR Series

KEY FEATURES

- Self-setting unit dynamically adapts to any fiber link
- Intelligent multi-acquisitions at multiple wavelengths in a single icon-based link view
- Comprehensive fault diagnosis and guidance
- Consolidated bidirectional link view (patent-pending)
- OTDR trace file generation (.sor)
- TIA/IEC automated pass/fail thresholds for enterprise/data centers (optional)
- Test two fibers at once with loopback testing mode (optional)

COMPATIBLE PLATFORMS

FTB family platforms



Handheld OTDR
MaxTester 700B/C Series



FTB-1v2/
FTB-1 Pro



FTB-2/
FTB-2 Pro

FTB-4 Pro

KEY NETWORK APPLICATIONS

- Point-to-point (P2P) access
- FTTx last mile
- LAN/WAN, enterprise and data center certification
- FTTx/PON MDU
- Fronthaul (FTTA, DAS and small cells) and backhaul
- FTTH unbalanced/tapered PON
- Passive optical LAN (POL)
- Metro core and long haul
- CWDM/DWDM
- Cable certification (IL/ORL measurement)
- Multifiber MPO cable characterization

GO BEYOND OTDR TESTING

Innovation is front and center at EXFO, and the intelligent Optical Link Mapper (iOLM) is a prime example of a game-changing solution. The iOLM lets you take advantage of the full power of your OTDR—bringing automation to a new level and enabling technicians of any skill level to become test experts in no time.

The iOLM integrates EXFO’s fiber testing expertise into simple, easy-to-use software that will step up your OTDR testing capabilities. Moreover, EXFO designs and optimizes each OTDR model to offer the best possible performance for its specific application, giving you a tailored solution to meet your needs and context.

iOLM | intelligent Optical Link Mapper

OTDR testing comes with its load of challenges...

iOLM—REMOVING THE COMPLEXITY FROM OTDR TESTING



**WRONG
OTDR TRACES**



**COUNTLESS
TRACES TO ANALYZE**

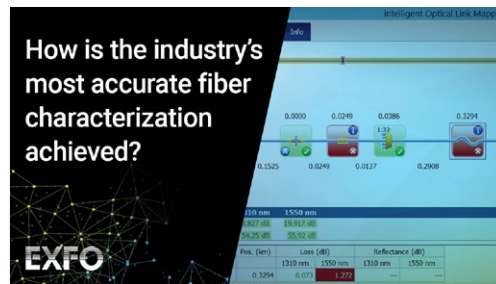


**REPEATING
THE SAME JOB TWICE**



**COMPLEX INSTRUMENT
TRAINING/SUPPORT**

To take on these challenges, EXFO developed a better way to test fiber optics



Watch it in action: [How iOLM works?](#)

How does it work?

**DYNAMIC
MULTIPULSE
ACQUISITION**

iOLM adjusts test parameters dynamically for ANY link under test—using a mix of short, medium and long pulses as needed.

➔

**INTELLIGENT
TRACE ANALYSIS**

Based on multiple acquisitions and with the help of advanced algorithms, iOLM is able to detect more events with maximum resolution.

➔

**ALL RESULTS
COMBINED INTO A
SINGLE LINK VIEW**

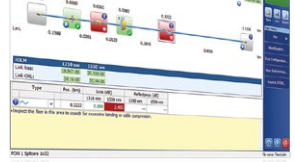
Results are visually displayed in an icon-based fiber-link view to quickly assess each event’s pass/fail status per standard selected, eliminating any risk of misinterpretation.

➔

**COMPREHENSIVE
DIAGNOSIS**

Delivers an analysis of failed events and suggests solutions; guides technicians in fixing faults quickly and successfully.

➔



Turning traditional OTDR testing into clear, automated, first-time-right results for technicians of any skill level.

Three ways to benefit from the iOLM

- 1** **OTDR combo (Oi code)**
Run iOLM and OTDR applications on one unit
- 2** **Upgrade**
Add the iOLM software option, even while in the field
- 3** **iOLM only**
Order a unit with the iOLM application only

UNIQUE FEATURES (INCLUDED IN iOLM STANDARD)

Single-ended fiber deployments made easy



Link-Aware™ technology

Optimize the test run: With one click, the unit automatically performs link recognition, sets the optimal parameters and launches multiple acquisitions and analyses—at multiple wavelengths—consolidating the results obtained for every link section and every network element. Get accurate information right away on each link element and export it to a single report.



Self-setting unit

Be the expert: Powered by Link-Aware™ technology, the iOLM self-manages the setting of all test parameters for ready-to-use intelligence that dramatically shortens the learning curve. Minimize training, avoid test misconfiguration and facilitate your technicians' transition from copper to fiber.



Optical link view

Crunch the data: Leaving complex OTDR traces behind, the simplified link mapper provides a straightforward view of the fiber under test, with clear icons and pass/fail verdicts. Get actual results: end-to-end visual assessment of your link, complete with event characterization and fiber status.



Intelligent diagnostics

Let it show you the way: Loaded with countless algorithms and a database of potential network failures, the iOLM guides you through your network's problem-solving process. Say goodbye to trace misinterpretation and ensure that all your technicians—not just the most experienced ones—can efficiently fix network issues right on the spot.



OTDR trace file generation

Fits your existing procedures: The iOLM can generate a universal and enhanced Bellcore format (.sor) OTDR trace to comply with your existing reporting and post-processing requirements. This OTDR trace integrates all the additional information gathered by the iOLM, providing more complete results.



Single iOLM file per link

Consolidate test results: While iOLM gives you more link information based on multiple acquisitions, it will not annoy you with plenty of messy files for a given link. iOLM simplifies reporting. What you get in the field is what you can see and process on your PC!



Bidirectional analysis

Automate process and results: Recommended to ensure true splice characterization, bidirectional analysis combines results from both directions to provide an average loss for each event. Use of bidirectional analysis with the iOLM ensures that you benefit from maximum resolution in both directions (multiple pulse widths at multiple wavelengths), as well as a consolidated view. iOLM is suited for both single- and dual-ended automated bidir solutions.



iOLM

Supports any network topology: P2P, centralized PON, cascaded PON or unbalanced/tapered PON (covered by standard iOLM).

OPTIMODES: SITUATION-SPECIFIC TESTING

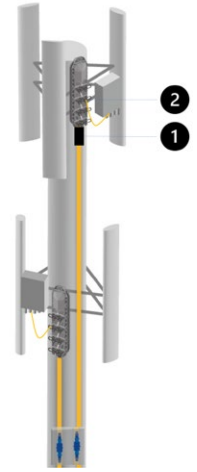
Optimodes are test configurations tailored to optimize specific use cases and go a step beyond recognized iOLM performance.

Optimode: Short-link close events

Application: fiber-to-the-antenna (FTTA), data centers, FTTx, central offices

Tailored to short links with close connectors, this Optimode offers the highest resolution achieved so far. No more hidden connectors creating false fails (merged losses), and no more guesswork to locate faulty connectors. When climbing up a tower, you want to know if the faulty connector is the one feeding the junction box (1) or the jumper (2) that connect to remote radio unit (RRU) to quickly and safely fix issues. This in turn reduces both installation and repair time.

Demerging closely spaced connectors is also key when troubleshooting data centers or central offices with closely spaced patch panels.



FTTA junction boxes and jumper connecting RRUs.

SPECIFICATIONS	720C SERIES	730C/735C/750C SERIES
Maximum link length ^a	2500 m	2500 m
Maximum link loss	8 dB	10 dB
Detection of 5 m patchcord ^{b, c}	Up to 2.5 dB loss	Up to 3.5 dB loss

- a. Total length, unidirectional or total loopback, including launch, loop and receive fibers.
- b. At 1550 nm, fiber length after reflection <= -55 dB, fiber section before event must be detectable.
- c. Typical.

Optimode: Fast short link (FSL)

Application: Data centers, enterprise LAN/WAN, FTTA

FSL Optimode is designed to quickly test short connectorized links in high-volume contexts. It tests up to five times faster than any regular iOLM characterization and provides accurate link loss, length and high-level mapping of the link, all in less than 10 seconds per fiber. FSL Optimode turns a powerful multipulse-width iOLM test unit into an extremely fast validation tool that enables quick assessment of short fiber optic links.

SPECIFICATIONS	MaxTester 715B	720C	730C/735C	750C
Fiber type	Singlemode	Multimode ^a	Singlemode	Singlemode
Maximum link length ^b (m)	2500	800	2500	10 000
Maximum link loss				
Simplex (dB)	3	4	3	6
Duplex ^c (dB)	5	6	5	8
Measurement time ^d (s)			< 10	

- a. 850 nm only.
- b. Total length, unidirectional or total loopback, including launch, loop and receive fibers.
- c. Duplex measurement in loopback mode. Requires activating iLOOP.
- d. Typical total time per wavelength, in Simplex and Duplex mode, excluding launch and receive calibration sequence.

Optimode: Fast medium range (FMR)

Application: FTTH feeder and distribution cables characterization, DCI, backhaul

FMR Optimode will quickly test P2P spliced links in high volume context.

No more dilemma between ease of an automated solution with built-in diagnosis, accuracy from dynamic multipulse, and speed. Within 30 seconds, characterize a < 20 km link at 2 wavelengths.

SPECIFICATIONS	
Fiber type	Singlemode
Testing time for two wavelength ^a (s)	< 30

- a. For a typical 20 km link, with 730C series.



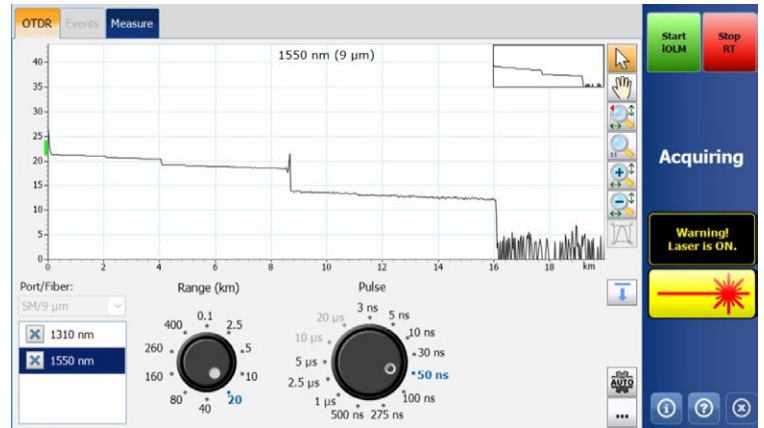
Example of a 3456 fibers cable.

ADDITIONAL FEATURES TO BOOST YOUR EFFICIENCY

iOLM Advanced (iADV)

Real-time test results

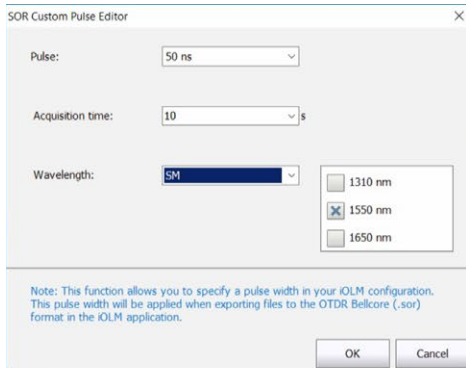
Activate the OTDR laser in continuous shooting mode directly from the iOLM interface. Have the unit adjust parameters on the fly without stopping or returning to submenus. The trace refreshes in real time, making it possible to monitor the fiber for sudden changes. It's perfect for a quick overview of the fiber under test, distance to break, to control field splicing or to check for obvious impairments before launching a thorough iOLM characterization. And you don't need to toggle between various interfaces or menus to get the right settings.



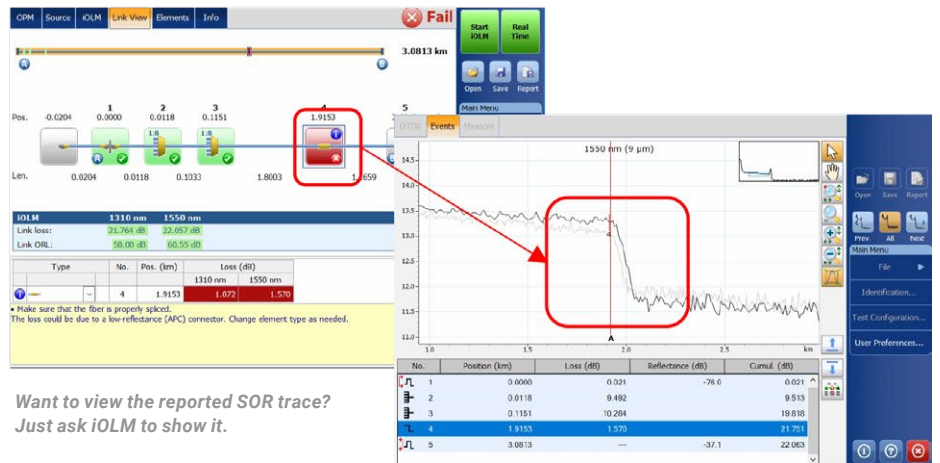
Dialing wheels allows to adjust real time acquisition parameters on the fly, immediately seeing the effect on the trace for optimal efficiency. Ready to launch the characterization? Just press the "start iOLM" button, no need to manually interrupt real time nor getting into any menus.

Advanced SOR support

iOLM delivers full job compliance without compromising on ease of use nor limiting the performance obtained from using dynamic multipulse acquisitions. iOLM manages an unrestricted number of acquisitions for optimal link characterization; simply input the pulse width, averaging time and wavelength(s) requested for the SOR file report to add it to the results package. You can also check the reported SOR trace right on iOLM.



Need a specific pulse width for the SOR in your close-out package? Just ask iOLM to include it to.



Want to view the reported SOR trace? Just ask iOLM to show it.

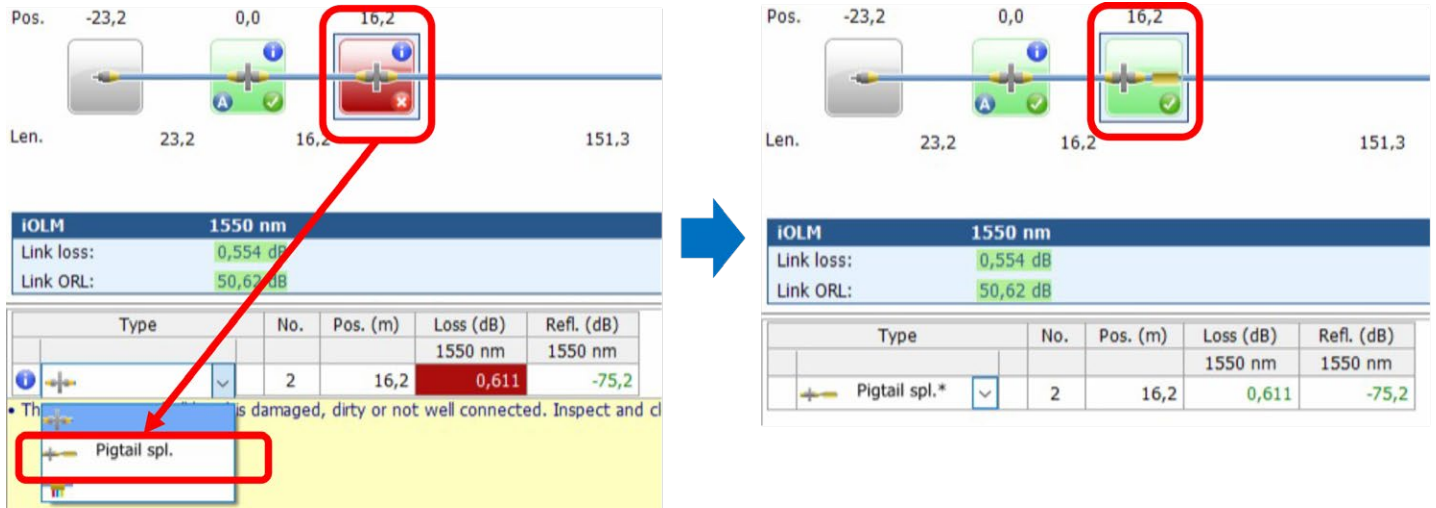
2:N splitter characterization

The iOLM is the only solution on the market capable of characterizing the 2:N splitter with a clear pass/fail verdict for multi-input or redundancy networks. The iOLM identifies 2:N splitters, as well as both of their input branches, allowing users to accurately document the network with one test (compared to three tests when using traditional methods).

iOLM expert mode

Specifically designed for the fiber test expert or manager requiring more flexibility in documenting the trace files for reporting purposes.

They can create their own custom network elements, define their specific icon and own thresholds to better match network plans and avoid false failures. For example, when splicing a G.657 fiber onto a G.652 fiber type, due to the fiber core diameter mismatch, an exaggerated loss reading is expected from unidirectional OTDR test (G.657-> G.652). Being able to identify those events and apply relaxed threshold accordingly will avoid false failures without resorting to a more expansive bidirectional measurement approach for splice characterization. Another common example is a spliced pigtail connector that will combine loss from a splice and from mating.



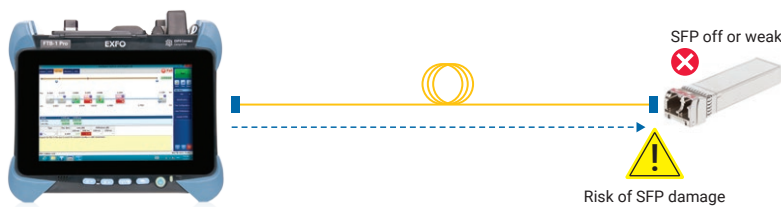
When you change events from a regular connector (threshold at 0.5 db in the example above) to a custom "pigtail spliced connector," a custom-built icon appears and the unit adjusts to a custom threshold (0.75 db in the example above) so you can avoid false failures. Modified elements are tagged with an asterisk (*) for traceability.

Expert mode also allows advanced trace editing (adding and deleting extra events) or re-analyzing the trace from the field.

Optimode: SFP safe troubleshooting

Application: P2P troubleshooting up to 100 km, passive CWDM/DWDM

Ideal for P2P troubleshooting when an SFP might be connected on the far end. When technicians are dispatched, they are still unaware of what is wrong and may accidentally damage a transceiver with an uncontrolled pulse width. EXFO's patented solution prevents this risk and guarantees no damages to the SFP while troubleshooting, yielding cost savings and faster time to recovery.



Watch it in action: [SFP safe mode](#)

Optimode: PON last-mile certification

Application: Last-mile FTTx

Tailored to last-mile certification, this Optimode tests all connections between customer premises and the splitter (including continuity at the splitter but excluding elements after the splitter).

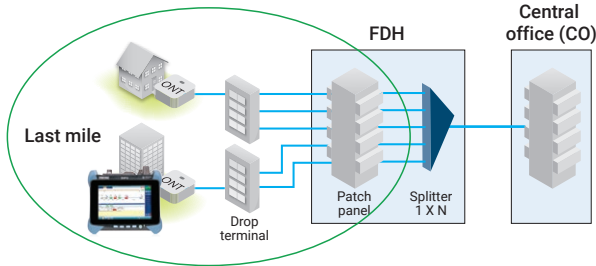


Figure 1. Certification of last-mile FTTH including continuity at splitter.

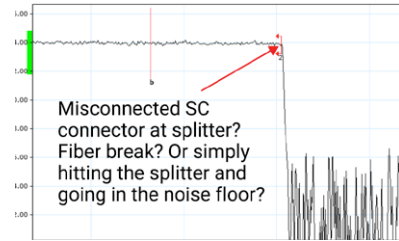


Figure 2. Last-mile OTDR trace.

With traditional last-mile OTDRs, the splitter is indicated as a fiber end (Figure2). However, just by controlling the distance of the last mile, it is not possible to certify that the splitter is connected. This Optimode verifies that the last-mile fiber segment is actually connected to the splitter, confirming installation quality (Figure 3). In addition, with an OTDR equipped with a live port, this mode can be used on dark fiber or live networks.

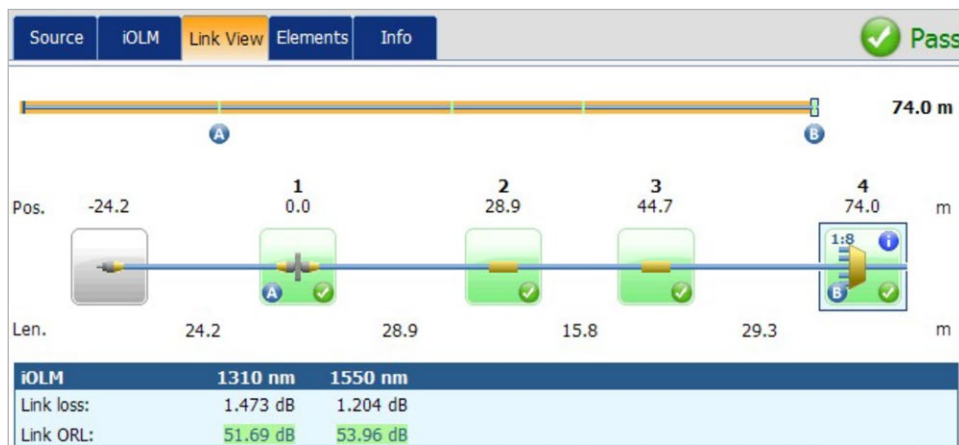


Figure 3. Test Pass—Last mile loss and ORL are within specifications. Splitter presence is confirmed, matching expected ratio and there is continuity to feeder. Last Mile installation is guaranteed.

SPECIFICATIONS		MaxTester 715B	730C/735C SERIES
Measurement time ^a (s)		35	20
Maximum link length (km)		20	20
Maximum last-mile fiber length (km)		5	5
Maximum last-mile fiber loss (dB)		2.5	2.5
Minimum fiber length after splitter or group (in the case of multistage PON)	1:2 splitter	30 m	25 m
	1:4 splitter	150 m	100 m
	1:8 splitter	400 m	150 m
	1:16 splitter	1500 m	400 m
	1:32 splitter	4500 m	1000 m
	1:64 splitter	—	3000 m

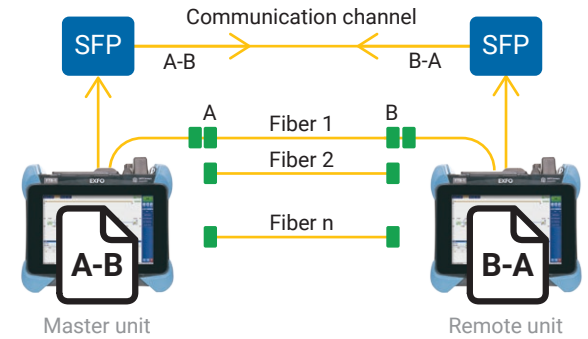
a. For a single-stage splitter, single wavelength, typical.

iLOOP

Use iLOOP with iOLM to increase productivity and accuracy using three different test methods to obtain bidirectional OTDR results. All situations can be covered with one software license, giving you the versatility to pick the right tool for the job.

Dual-ended automated bidirectional results ^{a, b}

Using two end-to-end devices, obtain bidirectional iOLM results without the need for post-processing or internet connections. Start a test from the main unit and take advantage of iOLM to make setup easy and avoid errors. Results are transferred to both devices through a communication fiber so both technicians stay up to date on test progress and quality. The full close-out package can be created on both devices directly in the field. Repairs or corrections can be done the same day to avoid redeploying resources while waiting for results in post-processing.



Loopback testing mode

The iLOOP feature allows your iOLM to double its testing efficiency by testing two fibers simultaneously using the loopback single-ended measurement. This capability halves testing time. The application splits results into two individual links to generate individual iOLM and OTDR (.sor) files and a PDF report without waiting for post-processing. This option is particularly efficient in applications such as FTTH, distributed antenna systems and data centers where Rx/Tx fibers can be tested simultaneously. Once the measurement is completed, iLOOP gives a pass/fail assessment for each single fiber.



Using the loopback test method and iLOOP option on your iOLM enables you to test two fibers at once. View only the A link, B link, or the complete A-B link including the loop.

Bidirectional results can be achieved by testing the fiber loop in both directions but from the same end, then combining the results from each individual fiber.

Automated and flexible bidirectional characterization

When instruments are connected to the internet, bidirectional results can be achieved by testing a fiber from both ends and sharing test results wirelessly. Bidirectional test files are available on both devices while on-site with no post-processing, preventing the need for additional truck rolls.

The same results can be achieved offline by sharing the individual results (which are combined in post-processing) for a bidirectional close-out package. This means that a single technician with a single device can do bidirectional testing asynchronously from each end of the fiber.

WHICH BIDIRECTIONAL SOLUTION IS RIGHT FOR YOU?

	iOLM LOOPBACK	iOLM WITH CLOUD WORKFLOW	DUAL-ENDED AUTOMATED BIDIRECTIONAL
Asynchronous testing	✗	✓	✗
Internet required	✗	✓	✗
20-60 km fibers	✓	✓	✓
+60 km fibers	✗	✓	✓
Instant data on device	✓	✗	✓
Dual device required	✗	✗	✓
Additional hardware required	✗	✗	✓

iLOOP provides even more versatility for bidirectional testing. Choose the solution that fits for each job. All three solutions are available as soon as your license is activated.

a. Available for dual FTB units equipped with FTBx-730C/735C/750C modules, iOLM, and iLOOP.

b. Requires one accessory kit per FTB unit (PCK-BIDIR120 KIT).

iCERT



Data center multistandard certification

The iCERT option turns the iOLM into an intelligent Tier 2 certifier with automated pass/fail thresholds for SM/MM cables. iOLM iCERT helps fiber installers certify or troubleshoot any enterprise or data center network to multiple cabling and application standards simultaneously. You can therefore certify the cabling according to internationally recognized standards (including TIA-568, ISO 11801), as well as the application that the fiber can carry (including IEEE or Fibre Channel standards).

Having predefined cable standards built into the application ensures compliance with test requirements of different standard bodies without risk of error during testing.

USING LAUNCH AND RECEIVE CABLES

EXFO recommends using a launch cable to compensate for the loss of the iOLM's connector, or to allow UPC network testing. Thanks to the dynamic multi-pulse width approach, launch cables up to 15m are suitable for most applications, so you can use compact and cost-efficient cables.

Using a launch cable extends the instrument's connector's life by reducing the number of matings, which positively affects ownership cost.

Wondering about the appropriate length of the launch or receive fiber for your specific test? iOLM can recommend length ranges and calibrate your launch and receive fiber length for optimal results.



Typical Test Fiber Lengths		
Select the expected loss for the measured link:		
Unknown		
According to the test configuration and the test method, the suggested lengths are:		
Test Fibers	Min.	Max.
Launch	15 m	5 km
Receive	15 m	10 km

TROUBLESHOOTING HIGH-SPEED MULTIMODE NETWORKS WITH ENCIRCLED FLUX



Whether for an expanding enterprise-class business or a large-volume data center, new high-speed data networks built with multimode fibers run under tighter tolerances than ever before. In the event of failure, intelligent and accurate test tools are needed to quickly find and fix the fault.

Multimode fibers are the trickiest links to test because the test results are highly dependent on each device's output conditions. Troubleshooting with a unit other than the construction unit may mislead the technician or result in the inability to find the fault, creating longer network downtimes.

For multimode fibers, EXFO recommends using an external launch mode conditioner that is Encircled Flux (EF)-compliant. The EF standard (as recommended in TIA-568 via TIA-526-14-B and IEC 61280-4-1 Ed. 2.0) is a way of controlling the source launch conditions so that tier-2 troubleshooting can be performed with maximum accuracy and consistency.

Use of an external EF-compliant device^a such as the SPSB-EF-C30 is a fast and easy way to fix faulty networks.

a. For more information about EF compliance, please read the [Encircled Flux test solution specification sheet](#).

iOLM OPTIONS AND FEATURES SUMMARY TABLE

PACK/OPTIONS	FEATURES	MaxTester				FTB-1v2/Pro ^a , FTB-2 Pro, FTB-4 Pro				
		MAX-715B	MAX-720C	MAX-730C	MAX-740C	FTBx-720C	FTBx-730C	FTBx-735C	FTBx-740C	FTBx-750C
iOLM Standard	Dynamic multipulse multiwavelength acquisition	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Intelligent traces analysis	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Single link view and event table	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Intelligent diagnostics	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SOR trace generation	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Single iOLM file per link for easy reporting	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Unbalanced/tapered PON characterization and troubleshooting	✗	✗	✓	✗	✗	✓	✓	✗	✗
	Optimode: Short-link close events	✓	✓	✓	✗	✓	✓	✓	✗	✓
	Optimode: Fast short link	✗	✓	✓	✗	✓	✓	✓	✗	✓
	Optimode: Fast medium range	✗	✓	✓	✗	✓	✓	✓	✗	✓
iOLM Advanced (iADV)^b	Real-time OTDR	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SOR pulse and wavelength editor	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SOR trace view	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Custom elements	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Advanced link edition and re-analysis	✓	✓	✓	✓	✓	✓	✓	✓	✓
	2:N splitter characterization	✗	✓	✓	✗	✓	✓	✓	✗	✓
	Optimode: SFP safe troubleshooting ^b	✗	✓	✓	✓	✓	✓	✓	✓	✓
	Optimode: PON last-mile certification	✓	✗	✓	✗	✗	✓	✓	✗	✗
iLOOP^b	iOLM loopback (unidirectional and bidirectional)	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dual-ended automated bidirectional iOLM ^c	✗	✗	✗	✗	✗	✓	✓	✗	✓
	Single-ended bidirectional iOLM via workflow management tool ^{b, d}	✓	✓	✓	✓	✓	✓	✓	✓	✓
iCERT^b	Cabling certification option	✗	✓	✓	✗	✓	✓	✓	✗	✓

a. The FTB-1v2/Pro single and dual carrier now support FTBx modules.

b. Singlemode only, configuration without splitter.

c. Requires one accessory kit per FTB unit (PCK-BIDIR120).

d. Requires TestFlow.

THE BENEFITS OF APC CONNECTORS FOR OTDR/iOLM TESTING



Like any OTDR, the iOLM will be affected by strong reflections at the unit's port. To ensure low reflection and maintain measurement accuracy, the iOLM singlemode port must be used with APC connectors. Another advantage of using APC connectors is their ability to handle harsher conditions without becoming highly reflective, while maintaining the unit's performance.

On the other hand, ultra-polished connectors (UPCs) are prone to being highly reflective when contaminated, worn or damaged. This affects singlemode measurement and leads to premature connector replacement. Although a UPC unit is not needed to test a UPC network, using an APC/UPC test jumper or a launch fiber (SPSB) ensures compatibility.

For best results, APC connectors are mandatory on singlemode ports when using the iOLM application.

ORDERING INFORMATION

To configure your new instrument with iOLM, please refer to the ordering guide available on the spec sheet of the selected model:

www.EXFO.com/products/field-network-testing/bu3-optical/otdr-iolm-testing

To upgrade your OTDR/iOLM-ready instrument ^a:

XX-XX

Base software ^a

Oi = Enables iOLM standard application in addition to your existing OTDR application
 Oi2 = Converts your existing OTDR software into an iOLM software
 00 = No change to your current base software

iOLM software option ^b

00 = iOLM Standard software
 iADV = Enables iOLM Advanced
 iLOOP = Enables loopback testing mode and automated bidirectional analysis ^{c, d}
 iCERT = Enables iOLM tier-2 cabling certification

Example: Oi-iADV-iCERT

a. For iOLM-ready instruments only (look for the "iOLM-ready" sticker on your unit or contact EXFO); if your instrument is not iOLM-ready, please contact EXFO for upgrades options.

b. Requires iOLM base software.

c. TestFlow required for single-ended automated bidirectional analysis.

d. PCK-BIDIR120 accessory kit required for dual-ended automated bidirectional analysis.

EXFO headquarters T +1 418 683-0211 **Toll-free** +1 800 663-3936 (USA and Canada)

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For the most recent version of this spec sheet, please go to www.EXFO.com/specs.

In case of discrepancy, the web version takes precedence over any printed literature.