intelligent Optical Link Mapper (iOLM)

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

Powered by LINK-AWARE™ TECHNOLOGY

4BTR BROADBAND TECHNOLOGY REPORTS 2012 Diamond TECHNOLOGY REVIEWS

Available on:

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

FROST & SULLIVAN 2016 BEST PRACTICES AWARD GLOBAL PORTABLE FIBER OPTIC TEST EQUIPMENT MARKET LEADERSHIP AWARD

Patent protection applies to the intelligent Optical Link Mapper, including its proprietary measurement software. EXFO's Universal Interface is protected by US patent 6,612,750.

The iOLM is designed to simplify OTDR testing by eliminating the need to configure parameters, and/or analyze and interpret multiple complex OTDR traces. Its advanced algorithms dynamically define the testing parameters, as well as the number of acquisitions that best fit the network under test. By correlating multipulse widths on multiple wavelengths, the iOLM locates and identifies faults with maximum resolution—all at the push of a single button.

SPEC SHEET

KEY FEATURES

- Self-setting unit dynamically adapting 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)

KEY NETWORK APPLICATIONS

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

PLATFORM COMPATIBILITY

FTB Family Platforms

FTB-1 V2/
FTB-1 Pro

FTB-2/
FTB-2 Pro

FTB-4 Pro

Handheld OTDR
MaxTester 700B/C Series

EXFO

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 even the untrained technician to become a test expert in no time.

The iOLM integrates all our expertise into a simple, easy-to-use software that will take your OTDR testing capabilities further than they've ever been. Moreover, because EXFO designs and optimizes each OTDR model to offer the best possible performance for its specific application, your solution will fit your need and context.

iOLM—REMOVING COMPLEXITY FROM THE OTDR

OTDR TESTING COMES WITH ITS SHARE OF CHALLENGES...

WRONG OTDR TRACES

COUNTLESS TRACES TO ANALYZE

REPEATING THE SAME JOB TWICE

COMPLEX INSTRUMENT TRAINING/SUPPORT

IN RESPONSE TO THESE CHALLENGES, EXFO DEVELOPED A BETTER WAY TO TEST FIBER OPTICS

iOLM | intelligent Optical Link Mapper

HOW DOES IT WORK?

Dynamic multipulse acquisition → **Intelligent trace analysis** → **Combine all results into a single link view and single report file** → **Comprehensive diagnosis** →

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

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

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.

Delivers an analysis of failed events and suggests solutions; guides the technicians in fixing the fault 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

THREE EASY STEPS TO A PERFECT FIT

STEP 1: Choose your network application

True OTDR performance goes far beyond simple product specifications.
It's about optimizing your network services, based on application-specific parameters.

STEP 2: Choose your form factor

› MaxTester 700B/C Series: Compact, dedicated, tablet-inspired, handheld OTDRs designed to perform singlemode tasks under tight budget constraints

› FTB-1 V2/FTB-1 Pro: Compact, modular handheld platform for multitest applications and advanced frontline troubleshooting

› FTB-2/FTB-2 Pro: The most compact multitechnology platform for the supertech

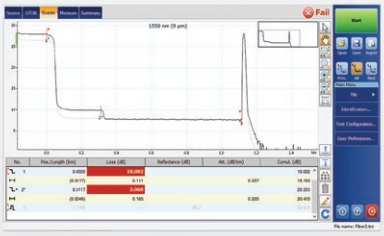
› FTB-4 Pro: The most flexible solution to test multiple technologies and high speed networks

PUT IT TOGETHER. FIND THE SOLUTION.

STEP 1: APPLICATIONS	STEP 2: FORM FACTOR — CORRESPONDING SOLUTION		
	MaxTester 700B/C Series	FTB-1 V2/FTB-1 Pro	FTB-2/FTB-2 Pro/FTB-4 Pro
LAN/WAN DATA CENTERS ENTERPRISE/PRIVATE NETWORKS POINT-TO-POINT ACCESS	**MAX-720C** Lightweight, on-the-go alternative	**FTB-720C + iCERT** High-efficiency frontline testing **FTB-720G V2** Fast optical and Ethernet turn-up	
FIBER-TO-THE-ANTENNA (FTTA) REMOTE RADIO HEAD (RRH) DAS/SMALL CELLS CELL BACKHAUL CATV	**MAX-720C** Lightweight, on-the-go alternative	**FTB-700G V2 + iLOOP** Complete optical and Ethernet turn-up kit (+CPRI/OBSAI) **FTB-720C + iLOOP** Optical turn-up kit	
FTTx LAST-MILE FTTx/PASSIVE OPTICAL NETWORKS (PON) FTTH/MDU PASSIVE OPTICAL LAN (POL) SHORT METRO	**MAX-715B** Last-mile, handheld troubleshooting **MAX-730C** Handy splitter characterization	**FTB-720C/FTB-730C** Faster FTTx/MUD/POL testing	**FTBx-720C/FTBx-730C** Complete network construction solution
METRO/CORE LONG HAUL		**FTB-735C/FTB-750C** Efficient Metro/Core and Long-haul testing in handy form factor	**FTBx-735C/FTBx-750C** No-Compromise Metro/Long-haul versatility
CWDM/DWDM		**FTB-740C** Compact kit for C/DWDM and hybrid passive C/DWDM networks **FTB-740G V2** Complete and compact C-RAN turn-up kit	**FTBx-740C** Complete CWDM/DWDM networks testing solution

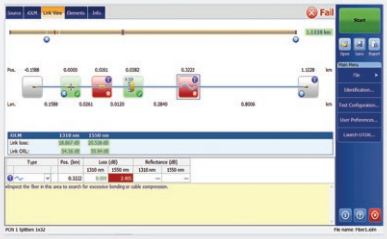
STEP 3: Choose your technology

Go traditional, go bleeding-edge, or combine the best of both worlds in a single unit:



› **Time-proven OTDR technology** with advanced modes, trace analysis and editing

and/or



› **Groundbreaking iOLM and Link-Aware™ technology**, with its multipulse approach, visual link depiction and per-event diagnosis

UNIQUE FEATURES

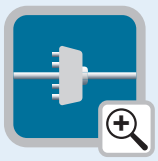
REVOLUTIONIZING SINGLE-ENDED FIBER DEPLOYMENTS

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 DIAGNOSIS

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 the 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 (VIA FastReporter 2 DATA POST-PROCESSING SOFTWARE)

Combine the 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 on both directions (multiple pulse widths at multiple wavelengths), as well as a consolidated view.

AUTOMATE ASSET MANAGEMENT. PUSH TEST DATA IN THE CLOUD. GET CONNECTED.

EXFO Connect

EXFO Connect pushes and stores test equipment and test-data content automatically in the cloud, allowing you to streamline test operations from build-out to maintenance.

EXFO

ADDITIONAL FEATURES [a]

BOOST YOUR EFFICIENCY

iOLM Advanced (iADV) [b]

REAL-TIME AVERAGING

Activates the OTDR laser in continuous shooting mode and adjusts 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 change. Perfect for a quick overview of the fiber under test, to control field splicing or to check the link before launching an iOLM acquisition.

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

iEX is a software option specifically designed for the fiber test expert or manager who requires more flexibility in documenting the trace files for reporting purposes. Because flexibility also means that you can create your own elements to better match your network plans, this option allows you to add extra events, delete events, or re-analyze the trace.

iOLM Pro [b]

(iPro includes iOLM Advanced)

LOOPBACK TESTING MODE (iLOOP)

The iLOOP feature allows your iOLM unit to double its testing efficiency by reducing testing time by 50% compared to a traditional unidirectional test method. This intelligent application relies on the loopback single-ended measurement method to characterize two fibers at once. The application splits the results into two individual links, thus eliminating the need for post-processing. iLOOP automatically generates individual iOLM and OTDR (.sor) files, in addition to PDF reports, for all your fibers directly from the field, enabling you to close your job immediately and move on to the next fiber pair faster.

This option is particularly efficient for applications such as fiber-to-the-antenna (FTTA), distributed antenna systems (DAS) and data centers, where iLOOP enables you to simultaneously test Rx/Tx fibers with a simple loop jumper between the two fibers. Once the measurement is completed, iLOOP applies pass/fail assessments and generates a report for each single fiber.

MULTIFIBER MPO CABLE CHARACTERIZATION AND TROUBLESHOOTING (iMF)

In combination with an external 1x12 MPO switch (supplied by EXFO), the iOLM allows for faster-than-ever testing of singlemode MPO cables, with no need to use a fan-out cable or cassette. Human manipulation is reduced by 90%, which in turn significantly reduces the risk of error. Thanks to the intelligent multifiber algorithm (iMF), a single push of the Start button initiates a fully automated test sequence of the 12 fibers and results in 12 single measurements.

iCERT [b]

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.

Notes

a. To see which feature is available for which model, please see the table on the following page.

b. Requires enabling iOLM standard.

PACK	FEATURES	MaxTester			FTB-1 V2/PRO					FTB-2/FTB-2-PRO						FTB-500	
		MAX-715B	MAX-720C	MAX-730C	FTB-720C/G V2	FTB-730C/G V2	FTB-735C	FTB-740C/G V2	FTB-750C	FTBx-720C	FTBx-730C	FTBx-735C	FTBx-740C	FTBx-750C	FTB-7400E	FTB-7300E	FTB-7400E
iOLM Standard	Dynamic multipulse acquisition	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Intelligent trace analysis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Link view	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Intelligent diagnosis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SOR trace generation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Single iOLM file per link for easy reporting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Optimode: Short-link close events	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓
iOLM Advanced (iADV) [a]	Real-time acquisition	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Custom elements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Advanced link edition and re-analysis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	2:N splitter characterization	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓
	Optimode: PON last-mile certification	✓	✗	✓	✗	✓	✓	✗	✗	✗	✓	✓	✗	✗	✗	✓	✗
	Optimode: Fast Short Link	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✗	✗	✗
iOLM PRO (iPRO - includes iADV) [a]	iOLM Loopback (iLOOP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Automated MPO cable characterization and troubleshooting (with EXFO switch) (iMF)	✗	✗	✗	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✗	✗	✗
iCERT [a]	Cabling Certification option	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓

SPECIALIZE YOUR iOLM WITH OPTIMODES

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

Optimode: Short-Link Close Events

Applications: FTTA, Data Centers, FTTx

Tailored to short links with close connectors, this optimode offers the highest resolution achieved so far, and enables technicians to pinpoint which connector is problematic with greater accuracy to fix issues while on-site. This in turn reduces both installation and repair time.

SPECIFICATIONS	720C SERIES	730C/735C/750C SERIES 7300E/7400E SERIES
Maximum link length [b]	2500 m	2500 m
Maximum link loss	8 dB	10 dB
Detection of 5 m patchcord [c, d]	Up to 2.5 dB loss	Up to 3.5 dB loss

Notes

a. Require enabling iOLM standard.

b. Total length, unidirectional or total loopback, including launch, loop and receive fibers.

c. At 1550 nm, fiber length after reflection <= –55 dB, fiber section before event must be detectable.

d. Typical.

Optimode: PON Last-Mile Certification

Applications: FTTx

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

With traditional last-mile OTDRs, the splitter is indicated as a fiber end. However, by only 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, leaving no uncertainty as to the quality of the installation. In addition, with an OTDR equipped with an singlemode live port, this mode can be used on dark fiber or live networks.

SPECIFICATIONS		MaxTester 715B	730C/735C Series/FTB-7300E
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

Note

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

Optimode: Fast Short Link

Applications: FTTA, data centers, enterprise LAN/WAN

Fast Short Link (FSL) Optimode is designed to quickly test short 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 s per fiber. The FSL Optimode turns a powerful multipulse-width iOLM test unit into an extremely fast validation tool that enables the quick assessment of short fiber optic links.

SPECIFICATIONS	MAX-715B	720C		730C/735C	750C
Fiber type	Singlemode	Mulitmode [a]	Singlemode	Singlemode	Singlemode
Maximum link length [b] (m)	2500	800	2500	5000	10 000
Maximum link loss					
Simplex (dB)	3	4	3	4	6
Duplex [c] (dB)	5	6	5	6	8
Measurement time [d] (s)	< 10				

Notes

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 (iPRO).

d. Typical total time per wavelength, in Simplex and Duplex mode, excluding launch and receive calibration sequence.

HOW TO PERFORM LOOPBACK MEASUREMENT USING EXFO PLATFORMS AND TEST METHODOLOGY

	iOLM		OTDR
Test Methodology	Unidirectional	Bidirectional	Unidirectional and bidirectional
MAX-700B/C	iLOOP	iLOOP [a]	FR2: PC
FTB-1/2/4	iLOOP	iLOOP [a]	FR2: PC/FTB
FTB-500	iLOOP	iLOOP [a]	FR2: PC/FTB

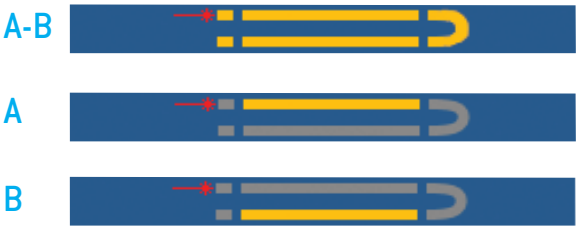
iLOOP = Loopback measurement achieved immediately in the field via iOLM iLOOP option.

FR2:PC/FTB = Loopback measurement achieved via post-processing in FastReporter2 software using a PC at the office, or using the FTB platform in the field.

FR2:PC = Loopback measurement achieved via post-processing in FastReporter2 software using a PC at the office.

Note

a. For singlemode fibers only. Bidirectional loopback measurement for multimode fibers achieved via post-processing in FastReporter2 software using a PC at the office, or using an FTB platform in the field.



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.

RECOMMENDATIONS

Angled Polished Connectors (APC) on a Singlemode Port

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 required for testing of a UPC network, using an APC/UPC test jumper or a launch fiber (SPSB) ensures compatibility.

Test Method

EXFO recommends using a 150-meter launch cable (SPSB) to compensate for the loss of the iOLM's connector, or to allow UPC network testing. This will also extend the instrument's connector life by reducing the number of matings–ultimately improving cost of ownership.

TROUBLESHOOTING OF HIGH-SPEED MULTIMODE NETWORKS WITH ENCIRCLED FLUX

EF READY

Whether for an expanding enterprise-class business or a large-volume data center, new high-speed data networks built with multimode fibers are running 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* such as the SPSB-EF-C30 is a fast and easy way to fix faulty networks.

*For more information about EF compliance, please read the Encircled Flux test solution specification sheet.

EXFO

THE BENEFITS OF APC CONNECTORS FOR OTDR/iOLM TESTING

To maximize the performance of your OTDR, EXFO recommends using APC connectors on singlemode ports. These connectors generate lower reflectance, which is a critical parameter that affects performance, particularly in dead zones. APC connectors provide better performance than UPC connectors, thereby improving testing efficiency.

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
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
UPG-iADV-iPRO = Converts your existing iOLM Advanced into iOLM Pro [c]
iPRO = Enables iOLM Pro [c]
iCERT = Enables iOLM tier-2 cabling certification

Example: Oi-iPRO-iCERT

Notes

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. iOLM Pro includes iOLM Advanced.

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