SPEC SHEET

FTBx-740C xWDM OTDR Series

C-BAND DWDM AND 18-WAVELENGTH CWDM TUNABLE OTDR SERIES FOR METRO ETHERNET AND C-RAN LINK CHARACTERIZATION

- C-Band DWDM and all 18 CWDM ITU channels in single OTDRs for testing through MUX/DEMUX channels, providing a complete end-to-end link characterization or troubleshooting for commercial services, C-RAN networks and metro Ethernet deployments.

KEY FEATURES

- CWDM+DWDM combo available in compact FTB-1v2
- C-BAND ITU DWDM grid channels 12-62 selection in a single OTDR port
- 18 CWDM channels covered in a single OTDR port
- Test through MUX/DEMUX/OADM
- In-service testing of active networks
- High-resolution and short dead zones
- Select favorite channels list
- iOLM-ready: one-touch multiple acquisitions, with clear go/no-go results presented in a straightforward visual format
- iOLM's SFP-Safe Troubleshooting: guarantees no damage to SFP
- Market-leading onboard PDF reporting solution and essential PC-based post-processing included for all users

APPLICATIONS

- Single-ended construction and troubleshooting solution
- CWDM and DWDM metro Ethernet links
- Commercial services deployments
- Fiber deep, remote PHY and node splitting
- CBH antenna feeds and C-RAN networks

COMPLEMENTARY PRODUCTS AND OPTIONS

Platform
FTB-1v2/FTB-1 Pro

Platform
FTB-2/FTB-2 Pro, FTB-4 Pro

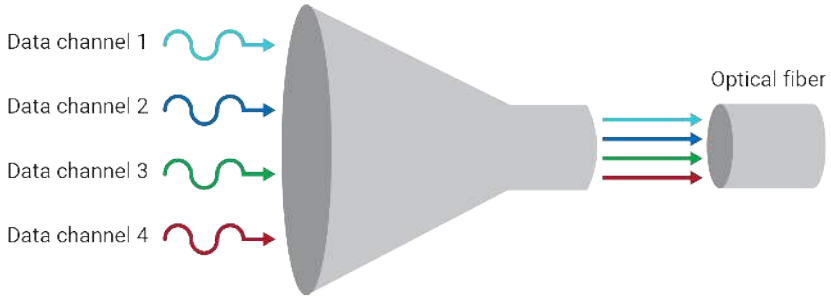
Fiber inspection scope
FIP-400B (WiFi or USB)

FastReporter

Advanced data post-processing software FastReporter

WAVELENGTH-DIVISION MULTIPLEXING BASICS

Wavelength-division multiplexing (WDM) is a technology that multiplexes (aggregates) several optical carrier signals onto a single optical fiber link by using different wavelengths in order to increase the bandwidth of an optical fiber link.

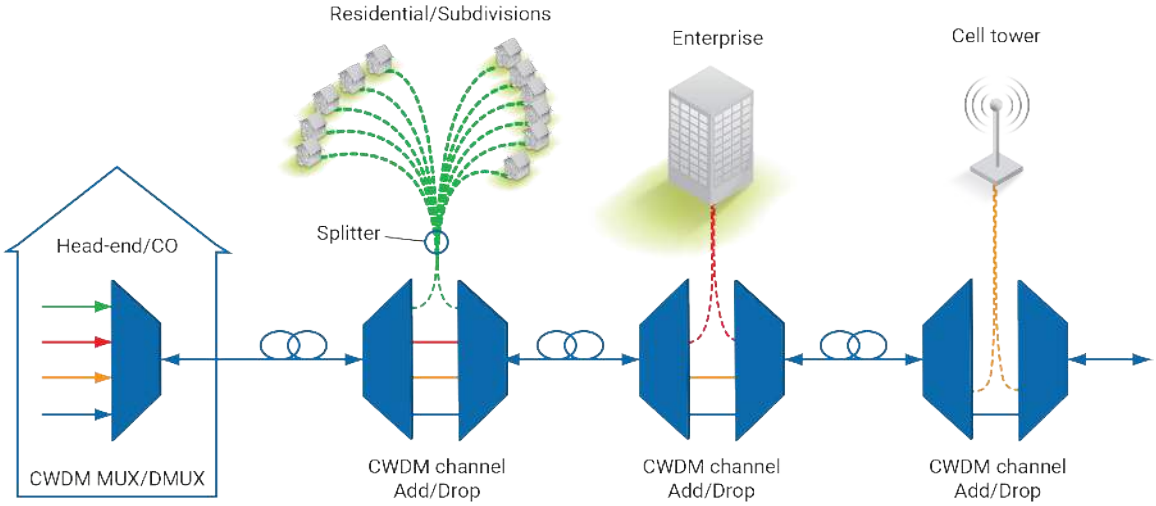


WDM acts as an "optical funnel" using different colors of light (wavelengths) for each signal.

CWDM VS. DWDM

Besides traditional WDM that relies on 1310 nm and 1550 nm, there are two main patterns aggregating a greater number of wavelengths/signals that have been widely used to expand the capacity of a network without adding more fiber: coarse wavelength division multiplexing (CWDM) and dense wavelength division multiplexing (DWDM).

CWDM uses up to 18 wavelengths, from 1271 nm to 1611 nm, with a channel spacing of 20 nm[a]. DWDM has been mainly deployed over the C-Band (1525–1565 nm) with channel spacing from 1.6 nm (200 GHz) to 0.4 nm (50 GHz)[b].



Each customer (enterprise or tower) receives a wavelength via an add/drop multiplexer (OADM)

APPLICATIONS

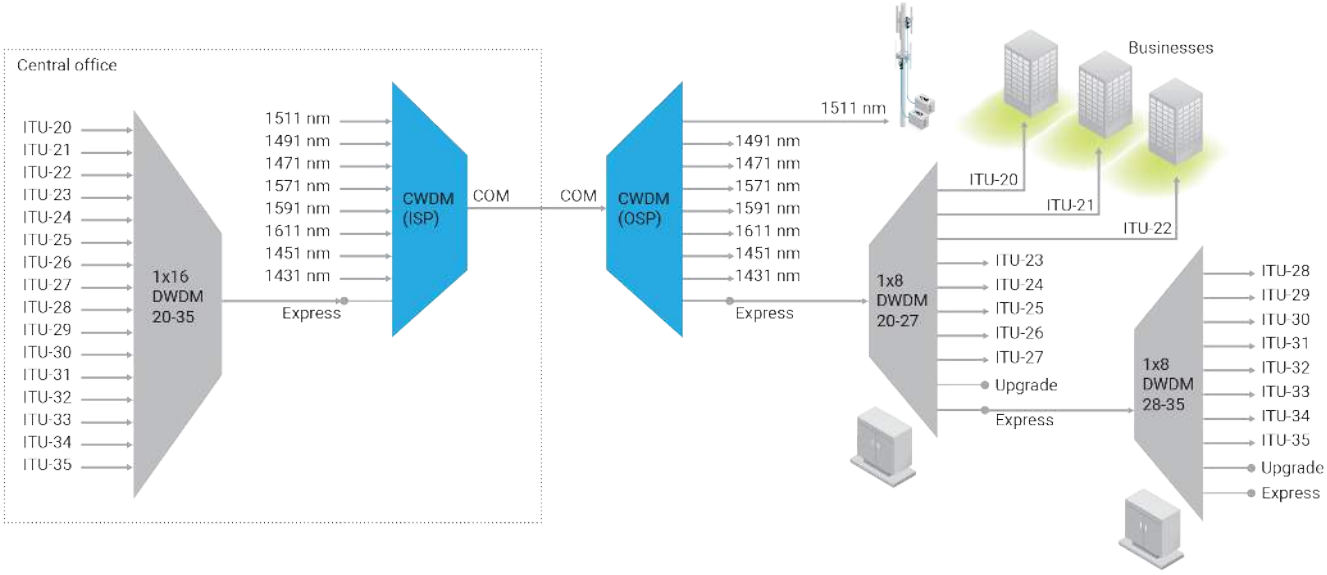
CWDM and DWDM are gaining popularity for C-RAN or commercial services deployments in which each wavelength can address a specific site, such as a cell tower or a customer.

Both CWDM and DWDM approaches are not mutually exclusive and co-exist in hybrid passive networks that feature DWDM over CWDM to maximize fiber capacity.

a. As defined in ITU-T G. 694.2

b. As per ITU-T G. 694.1, DWDM is also available over the L-Band (1570–1610 nm) and spectral grids are defined down 12.5 GHz channel spacing.

CWDM/DWDM PASSIVE NETWORKS

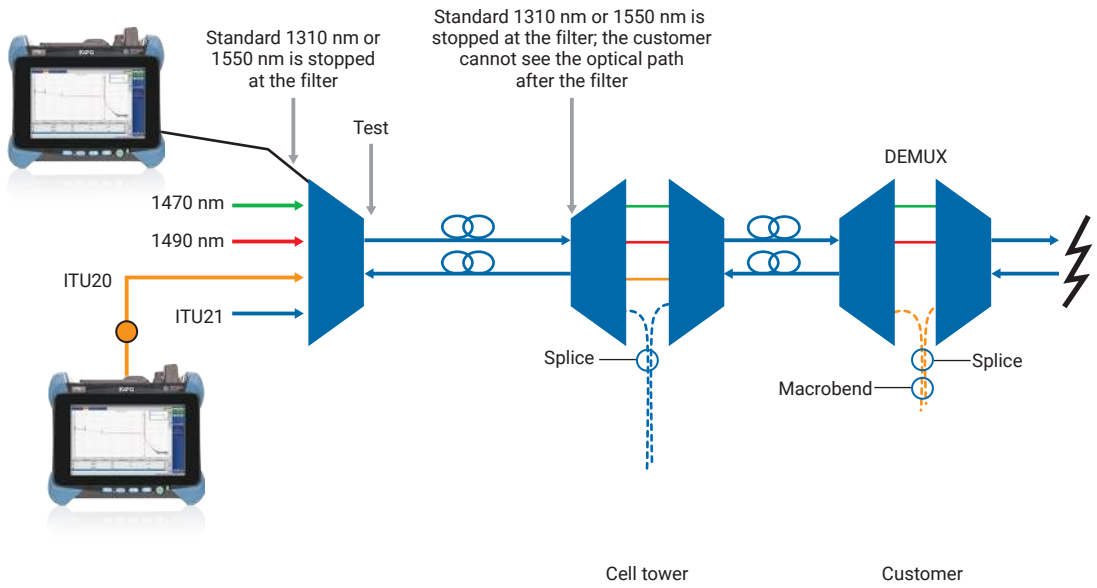


WHY USE AN xWDM OTDR DURING CONSTRUCTION?

Point-to-multipoint xWDM systems (CWDM and/or DWDM) in access networks, such as C-RAN or commercial services deployments, feature different topologies than in metro/core networks. In these scenarios, it is critical to ensure link continuity, meaning that the right wavelength is connected to the right port on the WDM multiplexer (MUX), demultiplexer (DEMUX) or optical add-drop modules (OADM). Wavelengths must be dropped at the right site by using the right OADM, and by connecting the fiber to the right port. It is a simple but very common issue in access networks of cable operators or fronthaul rings that could be avoided or fixed on-site before leaving the job site. An OTDR using the same channel/wavelength to test through MUX/DEMUX/OADM can provide users, from a single-ended, single operator, with a complete view of the link and total loss budget. Knowing the actual distances between the head-end and the target site, an OTDR can confirm that a wavelength is properly addressed.

USE A xWDM TUNABLE OTDR FOR:

- Single-ended CWDM/DWDM fiber characterization
- Validating the continuity and end-to-end loss through MUX, OADM and DEMUX, during construction
- In-service testing using the customer's wavelengths port—all without impacting other customer wavelengths and with no downtime
- Troubleshooting and characterization by a single operator from the head-end



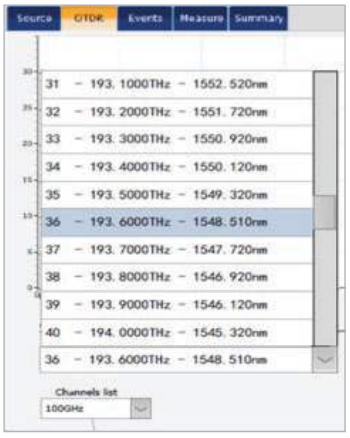
With a CWDM/DWDM OTDR, network service providers can see and validate the complete optical path prior to turning up the service.

FTBx-740C xWDM OTDR SERIES

This series includes one CWDM OTDR module to cover all 18 CWDM channels from a single port and one DWDM tunable OTDR module to cover DWDM C-Band channels. This solution is available in the FTB-1v2/FTB-1 Pro, FTB-2/FTB-2 Pro and FTB-4 Pro platforms.

The FTBx-740C xWDM OTDR Series has been designed with EXFO's renowned high-quality standards to stabilize central channels under test, preventing any drift/leakage into adjacent channels, which would otherwise affect other valuable customers. The OTDR's GUI lets the technician define a list of favorite channels over the C-Band (DWDM) or CWDM grid (CWDM) for quicker access and a more efficient test routine.

FTBx-740C-CWDM or FTBx-740C-DWC single module for FTB-1v2 single- and dual-carrier FTB-2/FTB-4 Pro mainframe



FTB-1v2 DC COMBOS: COMPACT AND FULLY LOADED FOR HYBRID PASSIVE CWDM/DWDM NETWORKS

Both CWDM and DWDM OTDRs can be housed in the compact and powerful FTB-1v2 dual-carrier platform[a].With the best CWDM and DWDM testing specifications in the industry, field technicians are empowered to capture accurate, first-time-right measurements in the fastest manner possible without carrying heavy equipment, missing a wavelength or requiring users to swap modules to cover the complete application.

The dual-carrier FTB-1v2 with CWDM and DWDM modules is ideal for use for commercial services in fiber-to-the building (FTTB), fiber-to-the-premises (FTTP) and fronthaul deployments that are evolving and migrating from CWDM to hybrid DWDM or any other WDM point-to-multipoint network architecture. With this test kit, multiple-service operators (MSOs) and contractors always have the required CWDM or DWDM wavelength to characterize through MUX, OADM and DEMUX, provide complete end-to-end link characterization and validate complete optical paths prior to turning up a service or troubleshooting for commercial services.

1. DWDM OTDR port
2. CWDM OTDR port
3. Mic/headset jack
4. Micro SD card slot
5. 1 GigE port
6. USB 3.0 port (1)
7. USB 2.0 ports (2)
8. VFL
9. Power meter

a. Refer to FTB-1v2 specification sheet for more details.

b. This picture is shown as a guideline only. Actual module may differ.

iOLM | intelligent Optical Link Mapper

iOLM—REMOVING THE COMPLEXITY FROM OTDR TESTING

OTDR testing comes with its load 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: the iOLM is an OTDR-based application 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.

How does it work?

DYNAMIC MULTIPULSE ACQUISITION → INTELLIGENT TRACE ANALYSIS → ALL RESULTS COMBINED INTO A SINGLE LINK VIEW → COMPREHENSIVE DIAGNOSIS →

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

Three ways to benefit from the iOLM

COMBO

Run both iOLM and OTDR applications (Oi code)

UPGRADE

Add the iOLM software option to your iOLM-ready unit, even while in the field

iOLM ONLY

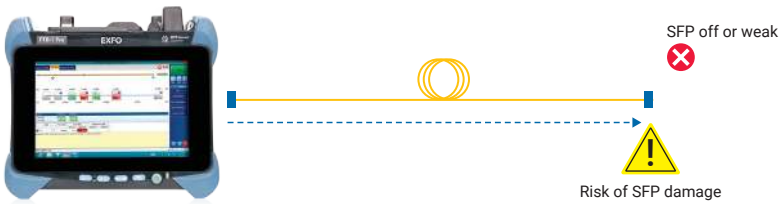
Order a unit with the iOLM application only

iOLM features value pack

In addition to the standard iOLM feature set, you can select added-value features as part of the **Advanced** or **Pro** packages. Please refer to the **iOLM specification sheet** for the complete and most recent description of these value packs.

iOLM Advanced with SFP-Safe Troubleshooting

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



Watch it in action: **SFP-Safe Troubleshooting**

FastReporter
Data post-processing software

GET ALL ADVANCED CAPABILITIES FOR FREE

FastReporter is a consolidated data management and post-processing solution designed to improve results quality as well as auditing and reporting productivity.

Download the latest version of FastReporter, launch the application and create your EXFO Exchange account to get the full range of capabilities, at no cost. EXFO Exchange automates and optimizes workflows, troubleshooting, field testing and reporting within a secured collaborative software platform for each step of network deployment.

FEATURES	FastReporter (version 3)	
	Basic	Full (now free with EXFO Exchange account)
Number of files	Up to 24 results	Unlimited
Measurement type	OTDR, iOLM, FIP, OLTS, OPM, CD, PMD	
Results viewer	•	•
Reporting – Basic (PDF)	•	•
Reporting – Advanced (Excel, PDF, custom)		•
Basic analysis – Bidir (OTDR and iOLM)	•	•
Advanced editing		•
Automated validation and results correction		•
Job management and identification edition	One file	Batch processing
Hundreds of additional features		•

DISCOVER THE INDUSTRY'S FIRST FULLY AUTOMATED FIBER INSPECTION SCOPES

Housing a unique automatic focus adjustment system, EXFO's fiber inspection scope series automates each operation in the sequence of inspecting a connector endface. The result: **fiber inspection is now a quick, one-step process that can be performed by technicians of all skill levels.**

Automated models

The FIP-500: wireless, autonomous and fully automated scope featuring the fastest inspection in the industry for both multi-fiber and single-fiber connectors. All-day testing without the need to recharge batteries or offload results.

The FIP-435B: connected to EXFO platforms or your smart device, this fully automated wireless scope enables connector certification in one step. View and store results on your EXFO platform or smart device.

The FIP-430B: fully automated inspection scope featuring USB wired connectivity to PC and EXFO platforms.

Semi-automated and manual models

The FIP-420B: semi-automated scope featuring a manual focus adjustment. USB wired connectivity to PC and EXFO platforms.

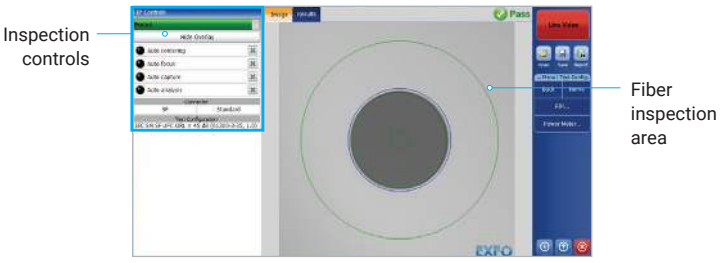
The FIP-410B: basic inspection features for manual inspection. USB wired connectivity to PC and EXFO platforms.

FEATURES	USB WIRED			WIRELESS	AUTONOMOUS
	FIP-410B	FIP-420B	FIP-430B	FIP-435B	FIP-500
Image capture	•	•	•	•	•
Five-megapixel CMOS capturing device	•	•	•	•	•
Automatic fiber image-centering function and focus adjustment		•	•	•	•
Automatic fiber image-focus adjustment			•	•	•
On-board pass/fail analysis		•	•	•	•
Pass/fail LED indicator		•	•	•	•
USB connectivity to an EXFO platform or PC	•	•	•	•	
Wireless connectivity to an EXFO platform or PC				•	
Wireless connectivity to a smartphone				•	•
Semi-automated multifiber / MPO inspection	•	•	•	•	
Fully automated multifiber / MPO inspection					•
On-board touch screen and data storage					•
SmarTips with automated thresholds and quick-connect mechanism					•

For more information, visit www.EXFO.com/fiberinspection.

EXFO

POWERFUL CONNECTOR ENDFACE IMAGE VIEWING AND ANALYSIS SOFTWARE



- Automatic pass/fail analysis of the connector endfaces
- Lightning-fast results in seconds with simple one-touch operation
- Complete test reports for future referencing
- Stores images and results for record-keeping

SPECIFICATIONS

All specifications valid at 23 °C ± 2 °C with an FC/APC connector, unless otherwise specified.

TECHNICAL SPECIFICATIONS

	FTBx-740C-CWDM	FTBx-740C-DWC
Laser nominal wavelength (nm)	1270, 1290, 1310, 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610	C-Band tunable 1527.99-1567.95 nm ITU-T G694.1 Channels 12-62 (191.2 THz - 196.2 THz)
Central wavelength uncertainty (nm) [a]	±3	DWDM 50Ghz channel wavelength control
Channel spacing tuning	N/A	50 GHz and 100 GHz increments on ITU-T G694.1 grid
Dynamic range at 20 µs (dB) [b]	>37	40
Event dead zone (m) [c]	1.1	0.7
Attenuation dead zone (m) [c]	5	3.5
Distance range (km)	0.1 to 400	0.1 to 400
Pulse widths (ns)	5 to 20 000	5 to 20 000
Sampling points	Up to 256 000	Up to 256 000
Sampling resolution (m)	0.04 to 10	0.04 to 10
Distance accuracy (m) [d]	±(0.75 + 0.0025 % x distance + resolution)	±(0.75 + 0.0025 % x distance + resolution)

GENERAL SPECIFICATIONS

Size (H x W x D)		158 mm x 24 mm x 174 mm (6 ¼ in x $^{15}/_{16}$ in x 6 $^{7}/_{8}$ in)
Weight		0.4 kg (0.9 lb)
Temperature	Operating Storage	Refer to platform's specification sheet –40 °C to 70 °C (–40 °F to 158 °F)
Relative humidity		0% to 95% non-condensing

LASER SAFETY

For complete details on all available configurations, refer to the ordering information section.

a. Typical, using 10 µs pulse.
b. Typical dynamic range with a three-minute averaging at SNR = 1.
c. Typical for reflectance at –45 dB, using a 5-ns pulse.
d. Does not include uncertainty due to fiber index.

ORDERING INFORMATION

FTBx-740C-DWC-XX-XX-XX

Model
FTBx-740C-DWC = DWDM Tunable SM OTDR
C-Band 1528-1568 nm (ITU 12-62),
100/50 GHz, 40 dB (9/125 µm)

Base software
OTDR = Enables OTDR application only
iOLM = Enables iOLM application only
Oi = Enables OTDR and iOLM applications

Singlemode connector
EA-EUI-28 = APC/DIN 47256
EA-EUI-89 = APC/FC narrow key
EA-EUI-91 = APC/SC
EA-EUI-95 = APC/E-2000
EA-EUI-98 = APC/LC

iOLM software option [a]
00 = iOLM Standard
iADV = iOLM Advanced
iLOOP = iOLM loopback mode

Example: FTBx-740C-DWC-iOLM-iADV-EA-EUI-91

FTBx-740C-CWXX-XX-XX-XX-XX

Model
CW10 = Singlemode CWDM OTDR module with 10 wavelengths:
1430/1450/1470/1490/1510/1530/1550/1570/1590/1610 nm

CW18-M8W = Singlemode CWDM OTDR module with 8 activated wavelengths:
1470/1490/1510/1530/1550/1570/1590/1610 nm
Hardware ready and field upgradable to:
1270/1290/1310/1330/1350/1370/1390/1410/1430/1450 nm

CW18-M18W = Singlemode CWDM OTDR module with all 18 activated wavelengths:
1270/1290/1310/1330/1350/1370/1390/1410/1430/1450 nm
1470/1490/1510/1530/1550/1570/1590/1610 nm

Singlemode connector
EA-EUI-28 = APC/DIN 47256
EA-EUI-89 = APC/FC narrow key
EA-EUI-91 = APC/SC
EA-EUI-95 = APC/E-2000
EA-EUI-98 = APC/LC

Wavelength options
00 = No additional activated wavelengths
M1310W = Add 1310 nm wavelength [b]

iOLM software option [a]
00 = iOLM Standard
iADV = iOLM Advanced
iLOOP = iOLM loopback mode

Base software
OTDR = Enables OTDR application only
iOLM = Enables iOLM application only
Oi = Enables OTDR and iOLM applications

Example: FTBx-740C-CW18-M8W-iOLM-iADV-M1310W-OTDR-EA-EUI-91

a. Available for models: CW18-M8W and CW18-M10W.

b. Please refer to the **iOLM specification sheet** for the complete and most recent description of these value packs.

OTDR CONNECTOR

APC connectors generate lower reflectance than UPC, which is a critical parameter that affects performance, particularly in dead zones. APC connectors provide better performance than UPC connectors, thereby improving testing efficiency. APC connectors on OTDR port are mandatory with FTBx-740C Series.

Note: UPC connectivity is available through an hybrid test jumper. Simply replace EA-XX by EI-XX in the ordering part number to get one free of charge hybrid test jumper for APC to UPC (SC/APC to SC/UPC or FC/APC to FC/UPC or LC/APC to LC/UPC).

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