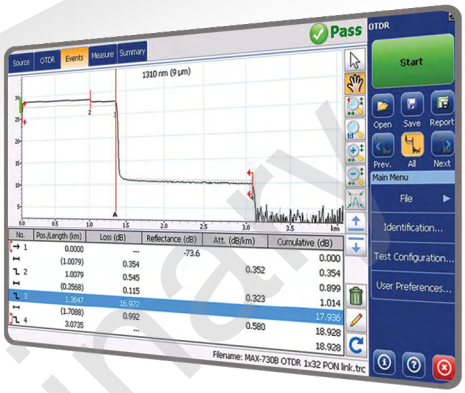
Optical Wave Expert

MEASURE, DIAGNOSE AND TROUBLESHOOT ON A SINGLE PORT



iOLM READY

SPEC SHEET

An industry-first device that combines channel power validation with tunable DWDM OTDR capabilities on a single port.

KEY FEATURES

- Integrated DWDM Channel Checker & OTDR on a single port (patent-pending)
- Intelligent channel power level diagnostics (iOCC)
- Compact and portable form factor.
- iOLM-ready: one-touch multiple acquisitions, with clear MUX/DEMUX characterization
- C-BAND ITU-T G.692 DWDM grid channels (12-62) with 100 GHz spacing
- Bar graph and table view on wide touchscreen display
- In-channel and out-of-band testing of active networks
- Intuitive graphical user interface (GUI) and workflow

APPLICATIONS

- DWDM link characterization through MUX, DEMUX and OADM
- DWDM link troubleshooting (DAA, RPHY, C-RAN)
- DWDM metro Ethernet links
- Deployment of commercial services
- P2MP access networks

RELATED PRODUCTS

Fiber Inspection Probe FIP-400B (WiFi or USB)

DWDM Channel Checker

xWDM OTDR FTBx-740C

Optical Spectrum Analyser

100G multiservice test module

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INTELLIGENT, AUTOMATED AND INTEGRATED. INNOVATION AT WORK.

The Optical Wave Expert integrates channel power validation and reflectometry characterization on a single port. This means that technicians can automatically identify faulty channels and follow through with fault location by leveraging intelligent OTDR capabilities.

The smart toggle to the integrated OTDR mode is done automatically, without having to set any parameters.

Technicians can now perform instant channel power readings through an intuitive GUI environment and seamlessly benefit from tunable OTDR capabilities. The rugged and compact MaxTester platform provides the most efficient and practical form factor for field use.

The integration of channel checker and OTDR capabilities on a single port means less unnecessary manipulation of the optical fiber and improved field efficiency. This translates into faster mean-time-to-repair (MTTR) and makes the trial and error approach–which can disable nodes–obsolete.

CHANNEL CHECKER

Thanks to the bar graph and the intuitive wide touchscreen, the channel power diagnostics are displayed clearly.

The intelligent Optical Channel Checker (iOCC) detects if power levels calls for OTDR troubleshooting. If the power is lower than –30 dBm or if there is no power, the OTDR parameters will be automatically configured. If power is too high to troubleshoot live networks, an out-of-band 1650-nm trace can be triggered to access issues up to the MUX.

By combining a channel checker and OTDR capabilities on a single port, the workflow becomes highly efficient. Technicians can assess the power levels and locate faults on the spot, for improved mean time to repair (MTTR). This patent-pending feature not only saves time but also reduces unnecessary manipulations, hence avoiding damage to the connectors.

DWDM OTDR

Once the channel power diagnosis has detected a faulty channel, the OTDR is automatically configured with the appropriate parameters. This seamless integration between the channel checker and OTDR removes manual manipulations that are prone to human error.

The iOCC delivers contextual information to the OTDR concerning which faulty channel to troubleshoot.

USE A DWDM TUNABLE OTDR FOR:

- Characterizing a single-ended fiber link
- Validating continuity and end-to-end loss through MUX, OADM and DEMUX (during construction)
- In-service testing using the customer's wavelength port–without impacting other customer wavelengths nor incurring downtime
- Troubleshooting and characterization by a single operator from the headend

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iOLM—REMOVING THE COMPLEXITY FROM OTDR TESTING

OTDR TESTING COMES WITH ITS SHARE OF CHALLENGES. . .

- WRONG OTDR TRACES
- COUNTLESS TRACES TO ANALYZE
- REPEATING THE SAME JOB TWICE
- COMPLEX INSTRUMENT TRAINING/SUPPORT

iOLM | intelligent Optical Link Mapper

In response to these challenges, EXFO developed a better way to test fiber optics: the intelligent Optical Link Mapper (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.

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

iOLM—REMOVING THE COMPLEXITY FROM OTDR TESTING (CONT'D)

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** package or standalone options. Please refer to the iOLM specification sheet for the complete and most recent description of these value packs.

iOLM FOR DWDM NETWORKS

All iOLM benefits tailored to DWDM network topologies and challenges: optimized DWDM algorithm, new icon to represent MUX, DEMUX and OADM.

Typical DWDM passive networks will exhibit a series of high loss MUX/DEMUX or OADM, which would lead the technician to use longer pulse widths to reach the end of the link at the expense of front-end resolution, in a very similar way to what has been seen in PON networks. iOLM's dynamic multipulse acquisition accurately characterizes the complete link with all necessary pulses, for best resolution along the link and generating a single iOLM file per link to facilitate reporting.

Many DWDM passive networks rely on duplex fibers for TX/RX on the same wavelength, iLoop will greatly increase efficiency in those cases, by characterizing TX and RX link in a single acquisition. iLoop will guide the user in the test sequence and will automate all the process of generating single files and reports per link.[a]

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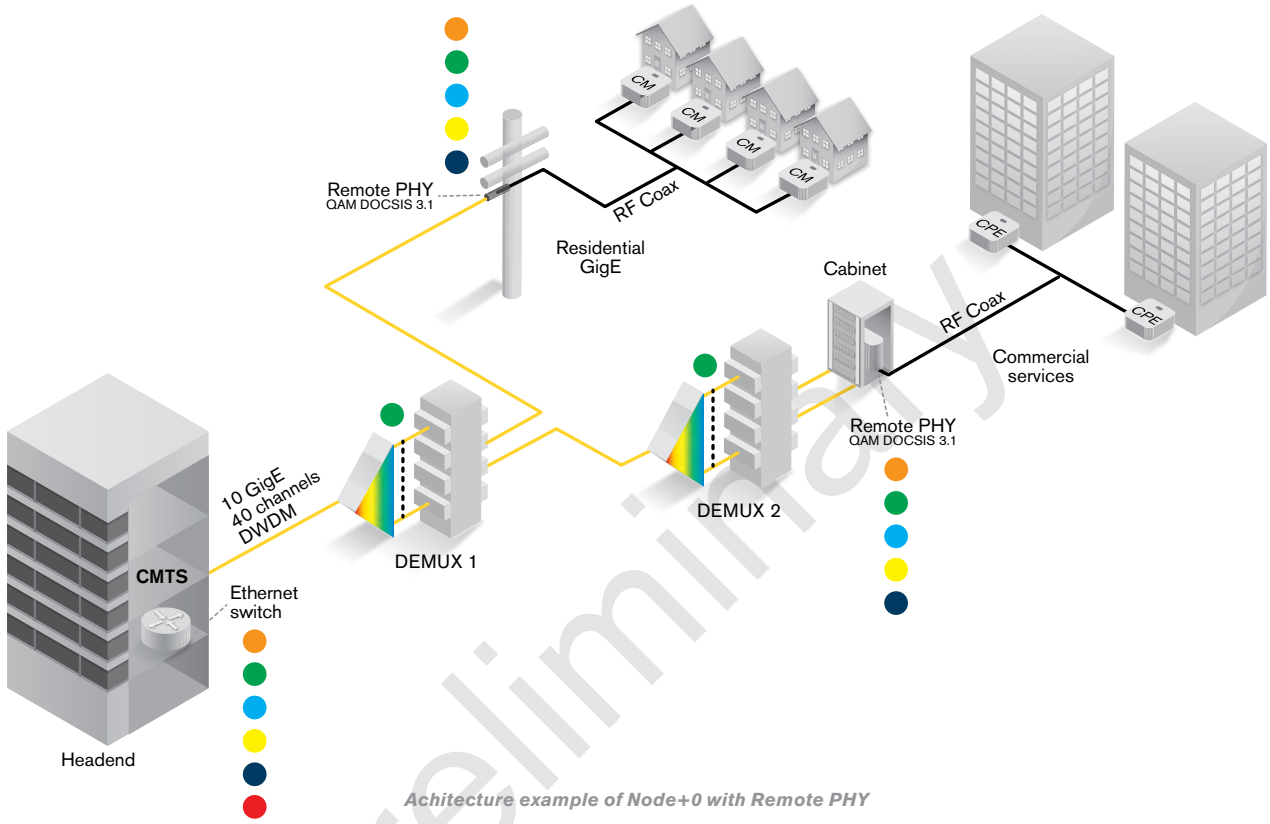
END-TO-END DWDM FOOTPRINT

Empowering the technician from the headend to the node



Achitecture example of Node+0 with Remote PHY

Essential tools for comprehensive testing

Optical Wave Expert

DWDM troubleshooting

FIP-400B Series

Connector inspection

FTB-740 Series

DWDM and CWDM testing

FOT-5205 and FTB-5235

DWDM spectral validation

EtherCHK-1-10

Ethernet service validation

FTB-5700

Dispersion testing

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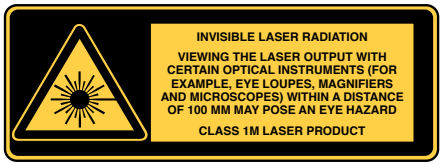
OTDR SPECIFICATIONS

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

TECHNICAL SPECIFICATIONS	
Laser nominal wavelength (nm)	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]	DWDM 50 GHz channel wavelength control
Channel spacing tuning	50 GHz and 100 GHz increments on ITU-T G694.1 grid
Dynamic range at 20 µs (dB) [b]	40
Event dead zone (m) [c]	0.7
Attenuation dead zone (m) [c]	3.5
Distance range (km)	0.1 to 400
Pulse widths (ns)	5 to 20 000
Sampling points	Up to 256 000
Sampling resolution (m)	0.04 to 10
Distance accuracy (m) [d]	±(0.75 + 0.0025 % x distance + resolution)

LASER SAFETY



OPTICAL CHANNEL CHECKER SPECIFICATIONS

TECHNICAL SPECIFICATIONS [e]	
Wavelength range (C-band)	1527.99-1567.95 nm (191.2 THz - 196.2 THz)
ITU channels	ITU-T G694.1 channels 12-62
Channel spacing	DWDM 100 GHz
Dynamic range per channel (dBm)	10 to -40
Maximum total safe power (dBm)	20
Absolute power uncertainty (dB) (typical)	1 dB
ORL (dB) [c]	> 35
Measurement time (s)	< 3

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

Notes

a. Typical, using a 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.
e. All specifications typical at 1550 nm and 23 °C ± 2 °C, with an FC connector.

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GENERAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS	
Display	7-in (178-mm) outdoor-enhanced touchscreen, 800 x 480 TFT
Interfaces	Two USB 2.0 ports RJ45 LAN 10/100 Mbit/s
Storage	2 GB internal memory (20 000 OTDR traces, typical)
Batteries	Rechargeable lithium-polymer battery 8 hours of operation as per Telcordia (Bellcore) TR-NWT-001138
Power supply	Power supply AC/DC adapter, input 100-240 VAC, 50-60 Hz
Size (H x W x D)	166 mm x 200 mm x 68 mm (6 9/16 in x 7 7/8 in x 2 3/4 in)
Weight (with battery)	1.5 kg (3.3 lb)
Temperature Operating Storage	 –10 °C to 50 °C (14 °F to 122 °F) –40 °C to 70 °C (–40 °F to 158 °F)
Relatine humidity	0 % to 95 % noncondensing

ORDERING INFORMATION

MAX-740C-DWOCC-XX-XX-XX-XX-XX-XX-XX-XX-XX-XX

Model
MAX-740C-DWOCC = DWDM tunable SM OTDR + Channel checker C-band 1528-1568 nm (ITU 12-62), 100 GHz, 40 dB (9/125 µm)

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

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
EI connectors = See section on next page

Power meter
00 = Without power meter
VFL = Visual fault locator (650 nm)
PM2X = Power meter; GeX detector
VPM2X = VFL and power meter; GeX detector

Power meter connector adapter
FOA-22 = FC/PC, FC/SPC, FC/UPC, FC/APC
FOA-32 = ST: ST/PC, ST/SPC, ST/UPC
FOA-54B = SC: SC/PC, SC/SPC, SC/UPC, SC/APC
FOA-96B = E-2000/APC
FOA-98 = LC
FOA-99 = MU

WiFi and Bluetooth®
00 = Without RF components
RF = With RF capability (WiFi and Bluetooth) [a, b]

Extra FIP-400B tips [c]
Bulkhead tips
FIPT-400-LC = LC tip for bulkhead adapters
FIPT-400-LC-APC = LC/APC tip for bulkhead adapter
FIPT-400-SC-APC = SC APC tip for bulkhead adapter [e]
FIPT-400-SC-UPC = SC UPC tip for bulkhead adapter

Patchcord tips
FIPT-400-U12M = Universal patchcord tip for 1.25 mm ferrules
FIPT-400-U12MA = Universal patchcord tip for 1.25 mm ferrules APC
FIPT-400-U25M = Universal patchcord tip for 2.5 mm ferrules [d]
FIPT-400-U25MA = Universal patchcord tip for 2.5 mm ferrules APC [e]

Base tips [f]
APC = Includes FIPT-400-U25MA and FIPT-400-SC-APC
UPC = Includes FIPT-400-U25M and FIPT-400-FC-SC

Inspection probe model [g]
00 = Without inspection probe
FP410B = Digital video inspection probe
Triple magnification
FP420B = Analysis digital video inspection probe
Automated pass/fail analysis
Triple magnification
Autocentering
FP425B = Wireless digital video inspection probe [b]
Automated pass/fail analysis
Triple magnification
Autocentering
FP430B = Automated analysis digital video inspection probe
Automated focus
Automated pass/fail analysis
Triple magnification
Autocentering
FP435B = Wireless analysis digital video inspection probe [b]
Automated focus
Automated pass/fail analysis
Triple magnification
Autocentering

Example: MAX-740C-DWOCC-OI-EA-EUI-91-VPM2X-FOA-54B-FP435B-APC-RF

Notes

a. Not available in China.

b. RF option is mandatory and automatically included if FP425B or FP435B fiber inspection probe model is selected.

c. This list represents a selection of fiber inspection tips that covers the most common connectors and applications but does not reflect all the tips available. EXFO offers a wide range of inspection tips, bulkhead adaptors and kits to cover many more connector types and different applications. Please contact your local EXFO sales representative or visit www.EXFO.com/FIPtips for more information.

d. Included when UPC base tips are selected.

e. Included when APC base tips are selected.

f. Available if inspection probe is selected.

g. Includes ConnectorMax2 software.