Optical Explorer

THE FIRST OPTICAL FIBER MULTIMETER (OFM):
INSTANT LINK VERIFICATION WITH EMBEDDED FAULT TRACKING

Verify optical links in seconds and automatically explore further when potential issues are suspected. Accelerate fiber rollouts, simplify activation procedures and improve robustness of repairs for better QoS and MTTR.

KEY FEATURES

Displays fiber link KPIs (length, loss and ORL) in under 3 seconds, through single-ended testing

On-the-spot detection and location of common causes of failures using EXFO’s patent-pending Fault Explorer

Intelligent device:
› No settings required
› Contextual wavelength auto-selection
› Built-in expertise to interpret link KPIs with patent-pending EXFO Advisor [5-star ranking system]

Built-in power checker and light source

Standalone go/no-go tester for day-to-day installation/repairs or paired with EXFO’s TestFlow mobile app for cloud-storage and full documentation of your jobs

Save on cost of ownership: lifetime calibration, no factory returns thanks to our patent-pending Click-Out optical connector

Rechargeable battery for over 10 hours of use on a single charge

3-year warranty

APPLICATIONS

Verification and troubleshooting of any singlemode fiber link up to 40 km (point-to-point)

FTTx service activation: GPON, EPON, XPGS-PON, 10GE EPON

FTTx last mile installation and repair, including in-service testing

Last mile/access network installation and repair

MDU installation

Fiber health check-up

Power level testing

Insertion loss and ORL testing

Fiber break location

Fault identification and location (splices, connectors, macrobends)

RELATED PRODUCTS AND ACCESSORIES

Test cord box
Click-Out optical connector
NEW CATEGORY OF TESTER TO TAKE ON THE CHALLENGES AHEAD

Keeping up with the accelerating pace of fiber deployments implies a major transformation in the way testing is approached. Optical Explorer has been designed from the ground up to tackle the challenges ahead and simplify testing. Optical Explorer allows streamlined procedures that reduce delays and escalation costs on the field while freeing up expert technicians to focus on more relevant tasks.

Optical Explorer is the industry’s first optical fiber multimeter (OFM), a new purpose-built category of tools empowering frontline techs to effectively carry out installation, activation and repair operations. Optical Explorer speeds up link health verification with embedded fault tracking—all in one single-ended test that’s quick and easy.

To cope with the increasing volume of fiber being rolled out, Optical Explorer has been designed from the start to equip large crews of frontline technicians:

› Optimized for **utmost user experience**. It is highly intuitive and easy to use for any technician regardless of experience in fiber optics or other technologies (such as copper or DSL).

› Designed to **reduce total cost of ownership (TCO)** throughout the product life cycle by cutting all hidden costs.

FIBER-OPTIC TESTING ACCESSIBLE TO ALL

Optical Explorer goes beyond basic testing as compared to power meters and fault locators. It offers a **brand new testing approach** powered by multiple pending patents.

Optical Explorer determines overall link quality and tracks potential faults, this in turn helps to boost work efficiency and quality for frontline techs. Unlike traditional instruments in their toolbox, Optical Explorer won’t leave field technicians blind to faults. Instead, Optical Explorer introduces new capabilities that break boundaries to redefine the role of field technicians. Each technician gets more autonomy to solve issues, enabling a leaner troubleshooting process that doesn’t require several technicians with various skills. Optical Explorer allows a fundamental shift in work organization—a new and better way to keep pace with the high volume of deployments and maintenance activities ahead.

INTELLIGENTLY EXPLORE FAULTS WHEN VERIFYING LINKS

While displaying **insertion loss (IL)**, **optical return loss (ORL)** as well as **fiber length** under a few seconds and in one single-ended process requiring no referencing, Optical Explorer also looks for potential faults. It won’t waste precious time on good links, but if a fault is suspected, Optical Explorer will automatically explore further and diagnose the fault, if applicable.

EXFO’s patent-pending Fault Explorer technology requires no additional steps or expertise to identify and locate common causes of failure (fiber breaks, macrobends, bad splices or faulty connectors), allowing technicians to fix problems on-the-go. Putting this new device in the hands of all technicians means faster installation and activation plus quicker mean time to repair (MTTR)—both with increased quality. Fully leverage the presence of fiber professionals on the field, while eliminating the cost and delays associated with dispatching experts and truck rolls. Once a link is verified with Optical Explorer, a frontline technician can leave a site assured that everything concerning optical links is ready for seamless acceptance, activation or service recovery.

Combined with power checking and light source capabilities in a rugged and compact form factor, Optical Explorer is an intuitive field companion that upskills any field technician.
TAKING ON YOUR CAPEX AND OPEX CHALLENGES

Large instrument fleets come with hidden or unplanned costs of ownership including:

› Technician training and support
› Maintenance costs and logistic
  › Periodic calibration
  › Entry connector replacement in factory
  › Planned and unplanned downtime
  › Complexity of maintenance management

Did you know?

Up to 95% of units sent back to factory for periodic calibration have severely damaged connectors needing replacement.

Connector health is critical to ensuring optimal performance and accurate results for optical test instruments. Optical connectors have a hard life in the field, and degrade over time until replacement is necessary.

OPTICAL EXPLORER TACKLES THE ROOT CAUSES OF THESE PAINS, ELIMINATING, BY DESIGN, HIDDEN COSTS OF OWNERSHIP

BUILT-IN EXPERTISE

Qualitative assessment of the fiber link: EXFO Advisor ★★★★★

To assess the quality of a link, seasoned fiber optic technicians can read and interpret the link’s key performance indicators (KPI), and hence determine how the link compares to an ideal installation. Technicians who are new to fiber optics do not have the necessary expertise to do such assessments. Even seasoned technicians may want a quicker and less subjective path towards quality diagnosis.

This is where EXFO’s 30+ years of expertise come into play. By leveraging the knowledge acquired by working closely with the major operators, network builders and owners across the globe, we’ve built algorithms that analyze the KPIs of fiber links by benchmarking them against industry best practices. This solution offers an objective opinion on the link quality. A rating based on how efficiently and robustly a link is designed. Meet EXFO Advisor, our unique and 5-star link quality indicator available on the Optical Explorer.

Wavelength auto-selection: enhanced contextual user assistance

Not sure which wavelength(s) you should use to verify or troubleshoot your fiber link or to optimize your operations? The built-in intelligence of the Optical Explorer will auto select the wavelength according to the situation. Optical Explorer will intelligently adjust the relevant settings for testing and workflow:

› Optimize process by verifying at 1550 nm only by default
› Macrobend or active link? Optical Explorer will self-adjust to tackle them when needed

1. Considering a product lifetime of 10 years.
2. Optical Explorer PRO version only.
OPTICAL EXPLORER, A HOST OF ESSENTIAL FUNCTIONS
FOR THE FRONTLINE TECHNICIAN

At the core of the intelligent multimeter: Flash Advisor

Lightning-fast link verification
Flash Advisor displays the link’s KPIs (link length, loss, and ORL) in under 3 seconds and assigns an objective 5-star quality assessment. It is a single-ended verification test, ideal for instant length check, sanity check or mass volume control on cables prior to or after installations and repairs.

More tools to make diagnostics and troubleshoot
To complement the link verification or when the KPIs do not meet expectations, the Optical Explorer offers a suite of diagnosis tools and troubleshooting functions. They allow technicians to further understand the link and to identify weak points or impairments.

Swift link verification with embedded fault tracking with Fault Explorer
Quickly verify a link after an installation or a repair while automatically, and only when needed, exploring potential faults. Within five seconds, Fault Explorer will display the KPIs (link loss, ORL and length) while tracking suspicious events. In the case of suspected underlying issues, Optical Explorer will automatically allocate extra testing time to precisely diagnose any kind of impairments or clear all doubts. Fault Explorer goes beyond flagging severe events like a fiber break, it identifies macrobends or any link component that is over-attenuating or over-reflecting, giving technicians the chance to optimize the link and solve issues onsite without any further escalation.

Link verification and element mapping with Link Mapper ¹
Link Mapper verifies the link and locates all faults and detectable elements. This visibility allows for “as found/as left” reports and helps to easily pinpoint faulty elements by reading their relative positions instead of interpreting the distance (e.g., specifying the fourth connection of the link versus the connection at 4.65 km).

Light and identify a fiber
Optical Explorer can be operated as a source in continuous mode or modulated signal (270 Hz, 330 Hz, 1 kHz, 2 kHz) for fiber identification.

Check power and identify a fiber
Check power level or loss or detect a tone to identify and trace a fiber.

1. Optical Explorer PRO version only.
Dedicated functions for the FTTH last mile

FTTH last mile architectures come with their own set of challenges. Optical Explorer brings additional specialized tests to meet the needs of these use cases.

**Last mile connectivity-to-splitter check**

By detecting the splitter presence or absence, Optical Explorer (the PRO model) can help technicians narrow down the root cause of a “no light” scenario on the customer side. Confirming the connectivity to splitter will allow excluding a continuity issue at the splitter, therefore pointing to a mixed fiber issue or a problem in the CO (OLT not emitting or not connected). Or, not finding the splitter would raise a flag on a possible disconnection at splitter.

**Demarcation function**

In FTTH last mile, the demarcation function is particularly helpful when a drop section (or vertical) of the link is installed and connected to the distribution fiber (horizontal). An installer can check that the section up to where the demarcation point meets the requirements (notably link length and loss) while providing full visibility for the operator on last mile optical health.
GO BEYOND WITH TestFlow MOBILE

Pair Optical Explorer with the TestFlow mobile app and leverage your smart device for:

› Occasional PDF reporting from the field to share on the go via email, text message or your favorite messaging app

› Cloud storage and full job documentation

› Get even more if your organization uses TestFlow’s collaboration solution thanks to job management and results sharing in real time.

Go to www.EXFO.com/TestFlow for more details.

DESIGNED FOR EFFICIENCY

EXFO’s extensive experience in field testing instruments has gone into creating Optical Explorer. Its ergonomic, robust design is a perfect fit for today’s field technician. The Optical Explorer leverages built-in expertise to diagnose the quality of your fiber—reliably and quickly.

1 Optical test connector: field-replaceable Click-Out optical connector on PRO models, fixed connector on Basic models
2 Click-Out optical connector (PRO models)
3 USB C charge port
4 Power on/off
5 4-inch touchscreen

Drop Dalquier

IDENTIFICATION INFORMATION
Job ID: 34H78PR
Test date: 2/27/20
Customer: ...
Test time: 12:48:37 PM
Comments: All good

LOCATION A    LOCATION B
Location:       Location:
Operator:       Operator:
Unit model:     OX1-PRO-MI
Unit S/N:       1290428

TEST PARAMETERS
Wavelengths: 1310 nm, 1550 nm
Launch cord:
Receive cord:
Index of refraction (IOR @ 1550 nm):

TEST RESULTS
Link length:

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>1310</th>
<th>1550</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position (km)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss (dB)</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>ORL (dB)</td>
<td>50.5</td>
<td>50.0</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss (dB)</td>
<td>Connector loss (dB)</td>
</tr>
<tr>
<td>ORL (dB)</td>
<td>Splice loss (dB)</td>
</tr>
</tbody>
</table>

Figure 3. Example of measurement PDF report generated from the smart device
PRO OR BASIC, FIND YOUR FIT

Optical Explorer is available in Installation (1310/1550 nm) and/or Maintenance (filtered 1650 nm) models. Go for the PRO version and experience the complete list of Optical Explorer benefits including full link mapping and lowest total cost of ownership thanks to our Click-Out optical connector.

**PRO**

- Light source / Power checker
- EXFO Advisor 5-star rating scale
- Contextual wavelength auto-selection
- Flash Advisor
- Fault Explorer
- Link Mapper
- Connectivity to splitter detection
- Click-Out optical connector

**BASIC**

- Light source / Power checker
- EXFO Advisor 5-star rating
- Contextual wavelength auto-selection
- Flash Advisor
- Fault Explorer

EXFO Advisor
## SPECIFICATIONS

### FIBER EXPLORER

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelengths</td>
<td>1310 nm ± 30 nm, 1550 nm ± 30 nm, 1650 nm ± 10 nm: Integrated filter isolation: 50 dB from 1265 nm to 1617 nm</td>
</tr>
<tr>
<td>Maximum link loss (dB)</td>
<td>15</td>
</tr>
<tr>
<td>Testing time</td>
<td>Flash Advisor (Distance, IL, ORL): 3 s</td>
</tr>
<tr>
<td></td>
<td>Fault Explorer (Distance, IL, ORL, fault exploration): down to 5 s</td>
</tr>
<tr>
<td></td>
<td>Link Mapper (Distance, IL, ORL, mapping of detectable elements): down to 10 s</td>
</tr>
<tr>
<td>Distance uncertainty</td>
<td>±1.5 m</td>
</tr>
<tr>
<td>Calibration interval (years)</td>
<td>10</td>
</tr>
</tbody>
</table>

### CONNECTIVITY-TO-SPLITTER CHECK

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Splitter type</td>
<td>Up to 1:32 ratio</td>
</tr>
<tr>
<td>Maximum link length (km)</td>
<td>20</td>
</tr>
<tr>
<td>Maximum last-mile fiber length (km)</td>
<td>5</td>
</tr>
<tr>
<td>Maximum last-mile fiber loss (dB)</td>
<td>2.5</td>
</tr>
<tr>
<td>Minimum fiber length after splitter</td>
<td>25 m, 35 m, 150 m, 250 m, 500 m</td>
</tr>
</tbody>
</table>

### POWER CHECKER

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelengths (nm)</td>
<td>1310, 1490, 1550, 1577, 1625, 1650</td>
</tr>
<tr>
<td>Power range (dBm)</td>
<td>–60 to 15</td>
</tr>
<tr>
<td>Power uncertainty</td>
<td>±0.5 dB at –20 dBm</td>
</tr>
<tr>
<td>Maximum input power (dBm)</td>
<td>17</td>
</tr>
<tr>
<td>Tone detection</td>
<td>270 Hz, 330 Hz, 1 kHz, 2 kHz</td>
</tr>
</tbody>
</table>

### LIGHT SOURCE

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelengths</td>
<td>1310 nm ± 30 nm, 1550 nm ± 30 nm, 1650 nm ± 10 nm</td>
</tr>
<tr>
<td>Output power (dBm) &lt;1&gt;</td>
<td>&gt; –8</td>
</tr>
<tr>
<td>Output power stability</td>
<td>±0.2 dB after 30 minute warm up (</td>
</tr>
<tr>
<td>Source modulation</td>
<td>CW, 270 Hz, 330 Hz, 1 kHz, 2 kHz</td>
</tr>
</tbody>
</table>

### LASER SAFETY

- **Invisible Laser Radiation**: Viewing the optical output with telescopic optical instruments (for example, telescopes and binoculars) may pose an eye hazard and thus the user should not direct the beam into an area where instruments are likely to be used. **Class 1M Laser Product**

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*All specifications are typical, at 23 °C ± 2 °C unless otherwise specified.

b. Depending on number of faults on link and link loss, measurement time will vary from 5 s to 40 s, typical.

c. For a 5 km link, total insertion loss 3 dB, and reflectance –42 dB, excluding uncertainty related to index of refraction.

d. With Optical Explorer PRO models only.

e. Splitter closest from subscriber.

f. Display high and low outside range.

g. With an Optical Explorer connector quality rated 5-stars by Optical output diagnosis.

h. Using an EXFO optical light source.

i. Must use a power meter/checker having measurement range ≥ 15 dBm.

j. Average power at duty cycle 1%/ > –10dBm for the PRO-MI option.
## GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>4-inch touch screen</td>
</tr>
<tr>
<td>Size (H x W x D)</td>
<td>171 mm x 93 mm x 48 mm (6 3/4 in x 3 11/16 in x 1 7/8 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.5 kg (1.1 lb)</td>
</tr>
<tr>
<td>Battery autonomy</td>
<td>&gt;10 hour (in typical conditions of use)</td>
</tr>
<tr>
<td>Battery charging</td>
<td>&lt; 5 hours charging time, when unit is off</td>
</tr>
<tr>
<td>Interfaces</td>
<td>WiFi 802.11 b/g/n 2.4 GHz, up to WPA2 encryption</td>
</tr>
<tr>
<td></td>
<td>Bluetooth 4.2 with BLE, Class 2 (compatible with 4.0 smartphones)</td>
</tr>
<tr>
<td>Storage capacity</td>
<td>1000 test results for local reading</td>
</tr>
<tr>
<td>Reporting</td>
<td>Single test: PDF on TestFlow mobile smart app</td>
</tr>
<tr>
<td></td>
<td>Batch of tests: online (TestFlow account required)</td>
</tr>
<tr>
<td>Temperature Operating</td>
<td>−10 °C to 45 °C (14 °F to 113 °F)</td>
</tr>
<tr>
<td></td>
<td>−40 °C to 70 °C (~40 °F to 158 °F)</td>
</tr>
<tr>
<td>Relative humidity range</td>
<td>≤ 93 %, non-condensing</td>
</tr>
<tr>
<td>Drop resistance</td>
<td>1 m (39 in)</td>
</tr>
</tbody>
</table>

## ACCESSORIES

### Carrying pouches and cases
- GP-3151: Optical Explorer soft pouch
- GP-10-061: Medium size soft carrying case
- GP-10-071: Small size soft carrying case
- GP-3157: Wrist strap

### Power adapters and battery
- GP-2227: USB AC adapter (includes interchangeable plugs for North America, Europe, UK and Australia)
- GP-2269: USB-A to USB-C cable (for charging purposes only—no data transfer)
- GP-3150: Rechargeable battery

### Connectors
- GP-2294: Replaceable connector door (quantity: 5)
- GP-3152: SC/APC Click-Out optical connector (for PRO models)
- GP-3153: SC/UPC Click-Out optical connector (for PRO models)

### Test cord box
- TCB-SM-SCA-SCA-20: SC/APC to SC/APC (SM fiber, 20 m)
- TCB-SM-SCA-LCA-20: SC/APC to LC/APC (SM fiber, 20 m)
- TCB-SM-SCA-FCA-20: SC/APC to FC/APC (SM fiber, 20 m)
- TCB-SM-SCA-SCU-20: SC/APC to SC/UPC (SM fiber, 20 m)
- TCB-SM-SCA-LCU-20: SC/APC to LC/UPC (SM fiber, 20 m)
- TCB-SM-SCU-SCU-60: SC/UPC to SC/UPC (SM fiber, 60 m)
- TCB-SM-SCU-LCU-60: SC/UPC to LC/UPC (SM fiber, 60 m)
- TCB-SM-SCU-FCU-60: SC/UPC to FC/UPC (SM fiber, 60 m)

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*To preserve optimal battery performance, do not expose to high storage temperatures for extended periods of time.*
YOUR STARTER KIT

Each Optical Explorer comes with:
› (1) soft pouch (GP-3151)
› (1) power adapter (GP-2227 + GP-2269)
› (1) battery (GP-3150)
› (1) wrist strap (GP-3157)

PRO models also include:
› (1) Click-Out optical connector with SC/APC (GP-3152) or SC/UPC (GP-3153) interface

Complement your kit with optional spare Click-Out optical connector (PRO models only) and test cord boxes to optimize your Optical Explorer experience.

ORDERING INFORMATION

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Model = Optical Explorer
Options =
I = Installation – 1310/1550 nm
M = Maintenance – 1650 nm (live)
PRO-I = Installation – 1310/1550 nm PRO version
PRO-M = Maintenance – 1650 nm (live) PRO version
PRO-MI = Installation and Maintenance – 1310/1550/1650 nm (live) PRO version

Connector interface a
88 = SC/APC
91 = SC/UPC

Example: OX1-PRO-M-88-TCB-SM-SCA-SCA-20

Optional test cord box
00 = None

For SC/APC Optical Explorer connector
TCB-SM-SCA-SCA-20 = SC/APC to SC/APC (SM fiber, 20 m)
TCB-SM-SCA-LCA-20 = SC/APC to LC/APC (SM fiber, 20 m)
TCB-SM-SCA-FCA-20 = SC/APC to FC/APC (SM fiber, 20 m)
TCB-SM-SCA-SCU-20 = SC/APC to SC/UPC (SM fiber, 20 m)
TCB-SM-SCA-LCU-20 = SC/APC to LC/UPC (SM fiber, 20 m)
TCB-SM-SCA-FCU-20 = SC/APC to FC/UPC (SM fiber, 20 m)

For SC/UPC Optical Explorer connector
TCB-SM-SCU-SMU-60 = SC/UPC to SC/UPC (SM fiber, 60 m)
TCB-SM-SCU-LCU-60 = SC/UPC to LC/UPC (SM fiber, 60 m)
TCB-SM-SCU-FCU-60 = SC/UPC to FC/UPC (SM fiber, 60 m)

a. Fixed connector on Basic model, Click-Out optical connector on PRO models.

EXFO serves over 2000 customers in more than 100 countries. To find your local office contact details, please go to www.EXFO.com/contact.

EXFO is certified ISO 9001 and attests to the quality of these products. EXFO has made every effort to ensure that the information contained in this specification sheet is accurate. However, we accept no responsibility for any errors or omissions, and we reserve the right to modify design, characteristics and products at any time without obligation. Units of measurement in this document conform to SI standards and practices. In addition, all of EXFO’s manufactured products are compliant with the European Union’s WEEE directive. For more information, please visit www.EXFO.com/recycle. Contact EXFO for prices and availability or to obtain the phone number of your local EXFO distributor.

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.