Optical Explorer

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

SPEC SHEET

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, ORL and power) 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)
- Diagnostics with suggested corrective actions

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, XGS-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.

What's an optical fiber multimeter (OFM)

An OFM is an essential handheld tool for optical technicians (it can be compared to multimeters used by electrical technicians).

OFMs quickly measure multiple key optical parameters such as loss (dB), optical return loss (dB), length (meters) and power (dBm). They help technicians verify the fiber optic link health and troubleshoot potential issues.

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

Patent-pending Click-Out optical connector[2]
Self-diagnose health of unit connector. Swap it for a brand new one on the go when needed—no factory servicing costs and no downtime.

Lifetime calibration[1]
No yearly factory return costs and no downtime

Built-in intelligence
No training curve and no need for remote expert assistance. Let the equipment handle it.

3-year warranty

Field replaceable battery
No factory or depot downtime

EXFO's proven robustness
Extremely rare repair downtime and associated costs

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

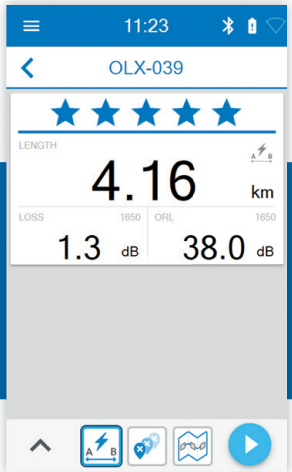
Contextual diagnostics

Actionable guidance helping technicians interpret failures, with suggested corrective actions.

a. Considering a product lifetime of 10 years.
b. 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

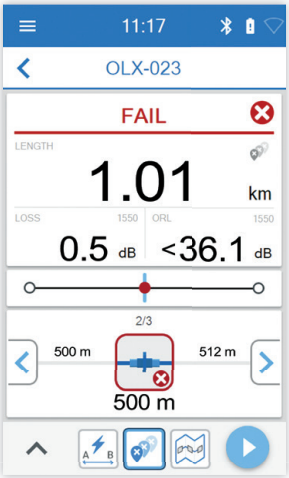


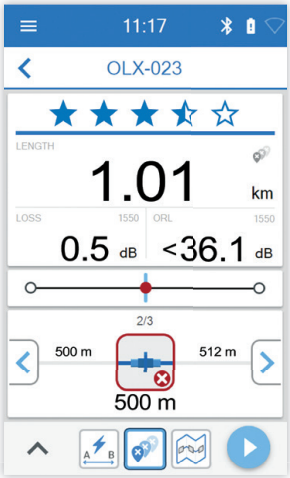
Lightning-fast link verification

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 suit of diagnosis tools and troubleshooting functions. They allow technicians to further understand the link and to identify weak points or impairments.



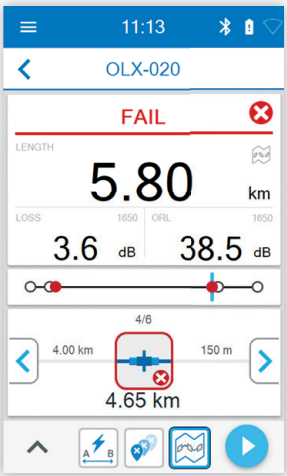


Swift link verification with embedded fault tracking with Fault Explorer

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[a]

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.

a. 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.

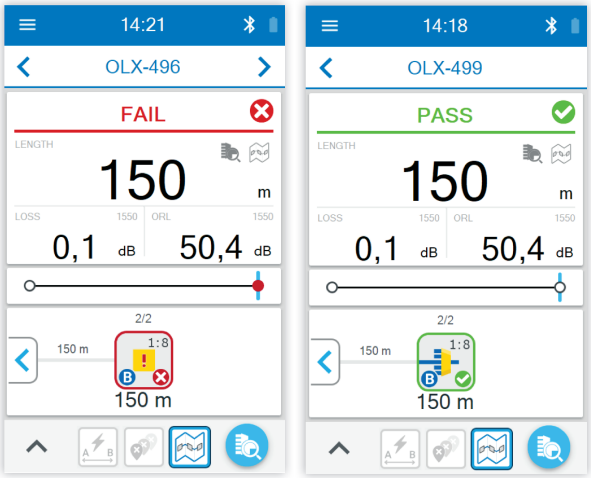


Figure 1. On the left, Optical Explorer informs the user that the expected splitter is not found. In second picture, Optical Explorer found the expected splitter, confirming link continuity.

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.

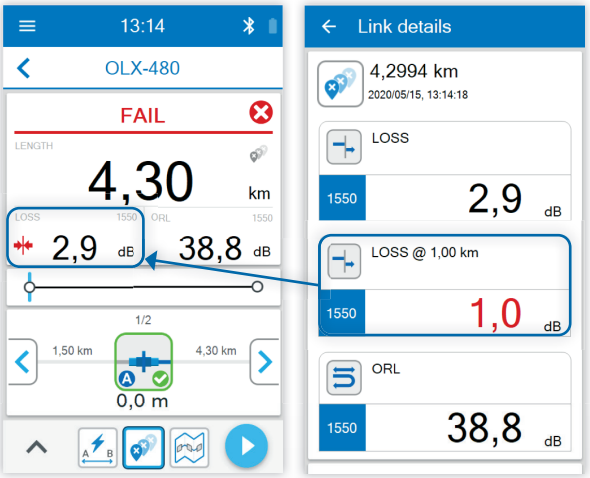


Figure 2. Optical Explorer highlights the target loss for the section up to demarcation point at 1 km is not met.

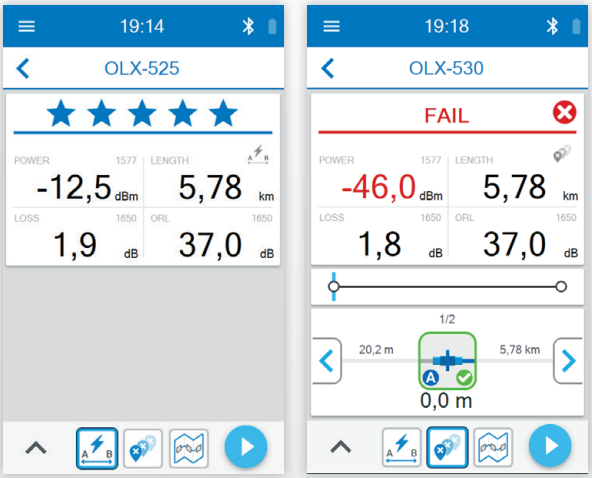


Figure 3. Optical Explorer displays power, length, loss and ORL in combined view.

Power, length, loss and ORL at push of a button [a]

Get all relevant optical metrics for PON activation or troubleshooting in a single action, single view, single report. Power is instantly displayed while fiber link key parameters (length, loss, ORL) are verified in seconds for PON activation and in-service troubleshooting at push of a button.

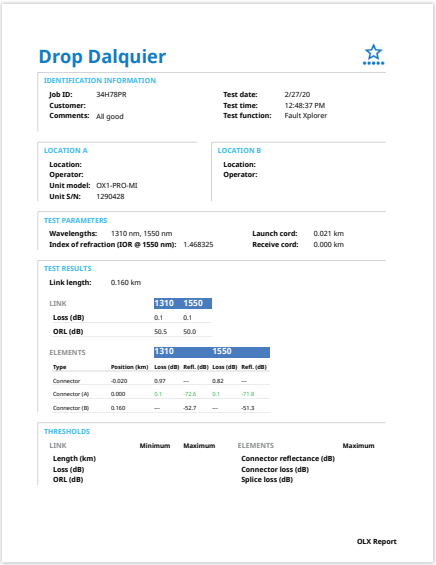
a. On maintenance models including 1650 nm in-service testing.

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.



Drop Dalquier

IDENTIFICATION INFORMATION

Job ID: 34H78PR
Customer:
Comments: All good
Test date: 2/27/20
Test time: 12:48:37 PM
Test function: Fault Xplorer

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

LOCATION B
Location:
Operator:

TEST PARAMETERS
Wavelengths: 1310 nm, 1550 nm
Index of refraction (IOR @ 1550 nm): 1.468325
Launch cord: 0.021 km
Receive cord: 0.000 km

TEST RESULTS
Link length: 0.160 km

LINK	1310	1550
Loss (dB)	0.1	0.1
ORL (dB)	50.5	50.0

ELEMENTS

Type	Position (km)	Loss (dB) 1310	Refl. (dB) 1310	Loss (dB) 1550	Refl. (dB) 1550
Connector	-0.020	0.97	—	0.82	—
Connector (A)	0.000	0.1	-72.6	0.1	-71.8
Connector (B)	0.160	—	-52.7	—	-51.3

THRESHOLDS

LINK	Minimum	Maximum
Length (km)		
Loss (dB)		
ORL (dB)		

ELEMENTS	Maximum
Connector reflectance (dB)	
Connector loss (dB)	
Splice loss (dB)	

OLX Report

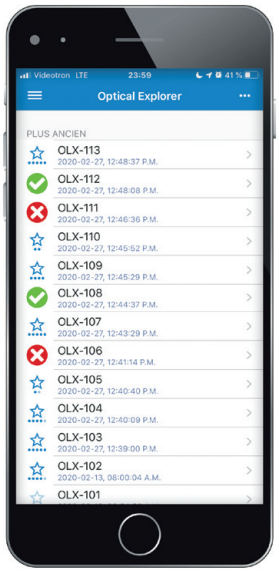


Figure 4. Example of measurement PDF report generated from the smart device

Available on the App Store

GET IT ON Google play

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

INSTALLATION OR MAINTENANCE, PRO VERSION, FIND YOUR FIT

Optical Explorer is available in Installation (I-1310/1550 nm), Maintenance (M-filtered 1650 nm) or Maintenance & Installations [a] (MI-1310/1550/filtered 1650 nm) configurations. Boost efficiency and lower total cost of ownership with the PRO version.

Optical Explorer includes

- Light source / Power Checker
- Flash Advisor/Fault Explorer
- EXFO Advisor 5-star rating
- Power, length, loss and PRL at push of a button [b]
- Contextual wavelength auto-selector [c]
- Diagnostics
- Demarcation function

PRO version also includes

- Link Mapper
- Connectivity to splitter detection
- Click-Out optical connector

a. MI configuration in PRO version only.
b. M & MI configurations.
c. I & MI configurations.

SPECIFICATIONS [a]

FIBER EXPLORER

Wavelengths	1310 nm ± 30 nm 1550 nm ± 30 nm 1650 nm ± 10 nm: Integrated filter isolation: 50 dB from 1265 nm to 1617 nm
Maximum link loss (dB)	15
Testing time	Flash Advisor (Distance, IL, ORL): 3 s Fault Explorer (Distance, IL, ORL, fault exploration): down to 5 s [b] Link Mapper (Distance, IL, ORL, mapping of detectable elements): down to 10 s [b]
Distance uncertainty	±1.5 m [c]
Calibration interval (years)	10

CONNECTIVITY-TO-SPLITTER CHECK [d, e]

Splitter type		Up to 1:32 ratio
Maximum link length (km)		20
Maximum last-mile fiber length (km)		5
Maximum last-mile fiber loss (dB)		2.5
Minimum fiber length after splitter [e]	1:2 splitter 1:4 splitter 1:8 splitter 1:16 splitter 1:32 splitter	25 m 35 m 150 m 250m 500 m

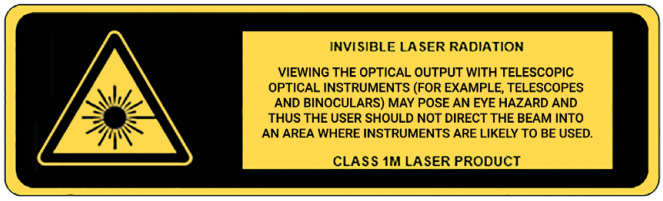
POWER CHECKER

Wavelengths (nm)	1310, 1490, 1550, 1577, 1625, 1650
Power range (dBm) [f]	−60 to 15
Power uncertainty [g]	±0.5 dB at −20 dBm
Maximum input power (dBm)	17
Tone detection [h]	270 Hz, 330 Hz, 1 kHz, 2 kHz

LIGHT SOURCE

Wavelengths	1310 nm ± 30 nm 1550 nm ± 30 nm 1650 nm ± 10 nm
Output power (dBm) [i, j]	> −8
Output power stability	±0.2 dB after 30 minute warm up ([Max. − Min.]/2)
Source modulation	CW, 270 Hz, 330 Hz, 1 kHz, 2 kHz

LASER SAFETY



a. 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

Display		4-inch touch screen
Size (H x W x D)		171 mm x 93 mm x 48 mm (6 $^{3}/_{4}$ in x 3 $^{11}/_{16}$ in x 1 $^{7}/_{8}$ in)
Weight		0.5 kg (1.1 lb)
Battery autonomy		>10 hour (in typical conditions of use)
Battery charging		< 5 hours charging time, when unit is off USB Type C charging port connector AC/DC charger/adapter input: ∼ 100 – 240 V; 50/60 Hz; 1.0 A max, output: ⎓ 5 V; 2 A
Interfaces		WiFi 802.11 b/g/n 2.4 GHz, up to WPA2 encryption Bluetooth 4.2 with BLE, Class 2 (compatible with 4.0 smartphones)
Storage capacity		1000 test results for local reading
Reporting		› Single test: PDF on TestFlow mobile smart app › Batch of tests: online (TestFlow account required)
Temperature	Operating Storage	–10 °C to 45 °C (14 °F to 113 °F) –40 °C to 70 °C (–40 °F to 158 °F) [a]
Relative humidity range		≤ 93 %, non-condensing
Drop resistance		1 m (39 in)
Display mirroring		From VNC client

GP-3151 GP-10-061 GP-10-071 GP-3157 GP-2227 GP-2269 GP-3150 GP-3152 GP-3153 TCB-SM-SCX-XXX-XX

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-SCA-FCU-20	SC/APC to FC/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)

a. 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.

Figure 5. Optical Explorer starter kit

ORDERING INFORMATION

OX1-XX-XX-XX

Model
OX1 = 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-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)

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

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