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)
- Diagnosis with suggested corrective actions

Built-in light source and power checker (dual-band available)

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 calls for 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 was designed to meet the needs of large crews of frontline technicians:

- **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, comparable 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 fiber optic link health and troubleshoot potential issues.

FIBER-OPTIC TESTING ACCESSIBLE TO ALL

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

Optical Explorer determines overall link quality and tracks potential faults. This helps to boost work efficiency and quality for frontline techs. Unlike conventional instruments, Optical Explorer won't leave field technicians blind to faults. Instead, Optical Explorer introduces new capabilities that break boundaries and redefine the role of field technicians. Each technician gets more autonomy to solve issues, thanks to 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** in 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 working 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 leads to faster installation and activation plus quicker mean time to repair (MTTR)—both with increased quality. Fully leverage the presence of fiber professionals in 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 all equipment related to 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 logistics
  - 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 the manufacturer 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 experience wear and tear in the field and degrade over time until replacement is necessary.

OPTICAL EXPLORER TACKLES THE ROOT CAUSES OF THESE ISSUES, SINCE IT'S DESIGNED TO ELIMINATE 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 learning 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 fiber assessment: EXFO Advisor ★★★★★

To assess the quality of a link, seasoned fiber optic technicians can read and interpret the link's key performance indicators (KPIs), and then 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 comes into play. We used knowledge acquired by working closely with major operators, network builders and owners across the globe to build algorithms that analyze the KPIs of fiber links by benchmarking them against optimal industry values. These algorithms provide an objective opinion on the link quality rating based on how efficiently and robustly a link is designed. Meet EXFO Advisor, our unique quality indicator built into 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? Optical Explorer's built-in intelligence automatically selects the wavelength according to the situation and intelligently adjusts 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 handle them when needed

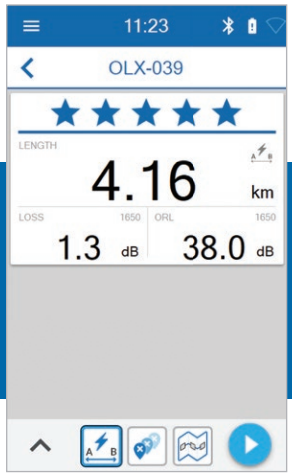
Contextual diagnosis

Actionable guidance helps 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

Flash Advisor: the core of the intelligent multimeter



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. This single-ended verification test is ideal for instant length checks, sanity checks or mass volume control on cables prior to or after installations and repairs.

More diagnostic and troubleshooting tools

Optical Explorer offers a suite of diagnostic and troubleshooting tools for those instances when you need more than link verification or when KPIs do not meet expectations.. These tools allow technicians to better understand the link and identify weak points or impairments.

Fault Explorer: swift link verification with embedded fault tracking

Quickly verify a link after an installation or repair while automatically (and only when needed) exploring potential faults. Within five seconds, **Fault Explorer** displays KPIs (link loss, ORL and length) while tracking suspicious events.If Optical Explorer suspects underlying issues, it automatically allocates extra testing time to diagnose any impairments (or state that there are no impairments). 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, so technicians can optimize the link and solve issues onsite without any further escalation.

Link Mapper: link verification and element mapping[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.

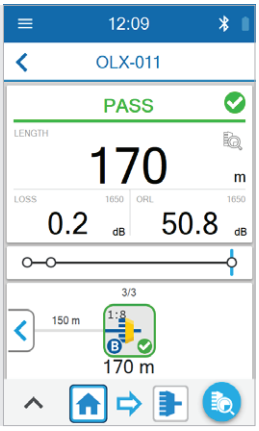
a. Optical Explorer PRO version only.

Dedicated functions for the FTTH last mile

FTTH last mile architectures come with their own set of challenges. Optical Explorer brings additional specialized tests for passing homes, drop installation, subscriber activation and troubleshooting.

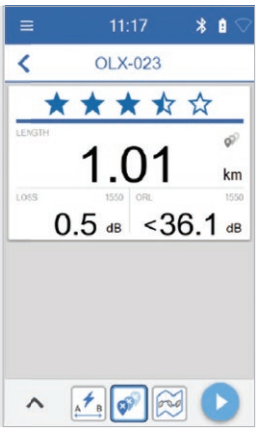
1 Install and troubleshoot distribution from terminal - test towards splitter to:

- Check ORL, length and loss to splitter
- Confirm splitter continuity
- Find faults up to splitter



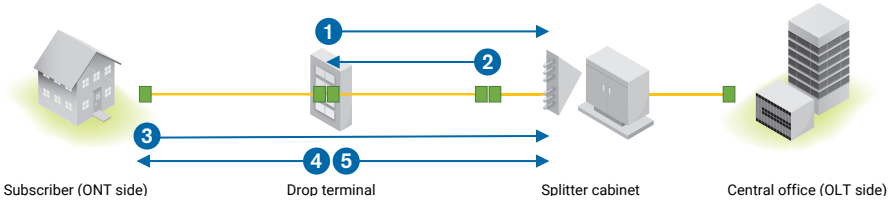
2 Install and troubleshoot distribution from splitter - test towards terminal to:

- Check ORL, length and loss to terminal in 3 s
- Search faults up to terminal on weaker links



Passing homes

Verify and troubleshoot distribution fiber installed between the drop terminal and the splitter cabinet.

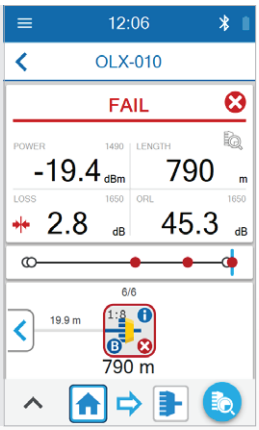


Activating new customers and restoring service

Certify drop installation, confirm power levels, troubleshoot faulty installs.

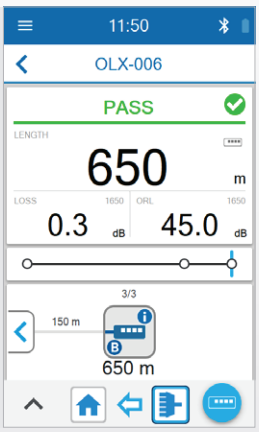
3 Install drop, activate and troubleshoot from inside premises - test towards splitter to:

- Check power, ORL, length and loss to splitter
- Confirm splitter continuity
- Find faults up to splitter
- Confirm loss is within budget up to a demarcation point



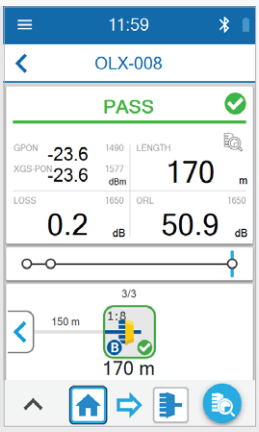
4 Activate and troubleshoot from outside premises - test towards ONT to:

- Check ORL, length and loss to ONT
- Confirm ONT is connected
- Find faults up to ONT



5 Activate and troubleshoot from outside premises - test towards splitter to:

- Check power, ORL, length and loss to splitter
- Confirm continuity at splitter
- Find faults up to splitter



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

Get all relevant optical metrics for PON activation or troubleshooting with a single action, in a single view, on a single report. Power is instantly displayed while fiber link KPIs (length, loss and ORL) are verified within seconds for PON activation and in-service troubleshooting–all at the push of a button. What happens if there are two co-existing services (GPON +XGS-PON, GPON +RF Video) on the same fiber? Optical Explorer handles both and shows them independently. [b]

Last mile connectivity-to-splitter check

By detecting splitter presence or absence, Optical Explorer (PRO model) can help technicians narrow down the root cause of a “no light” scenario on the customer side. If the splitter is absent, it may be disconnected. When splitter connectivity is confirmed, technicians can turn their attention to issues stemming from mixed fiber or the CO (OLT not emitting or not connected).

ONT detection

Optical Explorer allows troubleshooting from outside access points such as basement cabinets, outdoor terminals or splitter cabinets, so technicians can confirm that the ONT is connected to the drop cable without entering customer premises. When in-home/in-building cabling already exists prior to a new activation (new building, change of service provider), ONT detections also enable customers to perform installations themselves. Optical Explorer’s ONT detection feature is designed to work safely when testing towards the ONT, preventing damage to the ONT transceiver.

Demarcation

Demarcation in the last mile of FTTH 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 the demarcation point meets requirements (notably link length and loss) while providing full visibility on last mile optical health.

GO BEYOND WITH TestFlow MOBILE

Pair Optical Explorer with the TestFlow mobile app and use 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 for job management and results sharing in real time.

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

Drop Dalquier

IDENTIFICATION INFORMATION

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

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:	0.021 km
Index of refraction (IOR @ 1550 nm):	1.468325	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

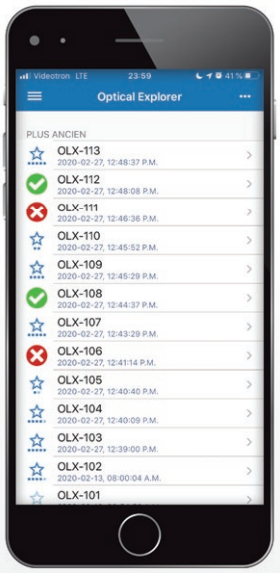
		1310		1550	
Type	Position (km)	Loss (dB)	Refl. (dB)	Loss (dB)	Refl. (dB)
Connector	-0.020	0.97	---	0.82	---
Connector (A)	0.000	0.1	-72.6	0.1	-71.8
Connector (B)	0.160	---	-52.7	---	-51.3

THRESHOLDS

LINK	Minimum	Maximum	ELEMENTS	Maximum
Length (km)			Connector reflectance (dB)	
Loss (dB)			Connector loss (dB)	
ORL (dB)			Splice loss (dB)	

OLX Report

Example of measurement PDF report generated from the smart device



Available on the App Store

GET IT ON Google play

a. On maintenance models including 1650 nm in-service testing.
b. On maintenance model with inline dual-band power checker

DESIGNED FOR EFFICIENCY

EXFO's extensive experience in field testing instruments is embedded in Optical Explorer. It leverages this built-in expertise to diagnose the quality of your fiber reliably and quickly. All this, plus its ergonomic, robust design makes Optical Explorer a perfect fit for today's field technician.

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, MAINTENANCE OR PRO VERSION—FIND YOUR FIT

Optical Explorer is available in Installation (I-1310/1550 nm), Maintenance (M-filtered 1650 nm) or Maintenance & Installation [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 ORL at the push of a button [b]
- Contextual wavelength auto-selector [c]
- Diagnosis
- Demarcation function

PRO version also includes

- Click-Out optical connector
- Link Mapper
- Connectivity to splitter detection
- ONT detection [d]

a. MI configuration in PRO version only.
b. M & MI configurations.
c. I & MI configurations.
d. M, M-PPM & 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 1:64
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	25 m
	1:4 splitter	35 m
	1:8 splitter	150 m
	1:16 splitter	250 m
	1:32 splitter	500 m
	1:64 splitter	1000 m

POWER CHECKER

	OX1-I, OX1-M, OX1-PRO-I, OX1-PRO-M, OX1-PRO-MI	OX1-PRO-M-PPM
Wavelengths (nm)	1310, 1490, 1550, 1577, 1625, 1650	1310, 1490, 1550, 1577, 1625, 1650, 1490+1550, 1490+1577
Power range (dBm) [f]	−60 to 15	−60 to 23
Maximum input power (dBm)	17	23
Power uncertainty [g]	±0.5 dB at −20 dBm	
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 warmup ([Max. − Min.]/2)
Source modulation	CW, 270 Hz, 330 Hz, 1 kHz, 2 kHz

LASER SAFETY

Complies with FDA 1040.10 and IEC 60825-1:2014

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 to subscriber.
f. Display high and low outside range.
g. In broadband mode, 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 hours (typical use)
Battery charging		< 5-hour charge 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
Reporting		• Single test: PDF on TestFlow mobile 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

coming soon
GP-3186

coming soon
GP-3172

GP-2227

GP-2269

GP-3150

GP-3152

GP-3153

coming soon
GP-3178

TCB-SM-SCX-XXX-XX

coming soon
TCBI-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
GP-3186	Hands-free glove
GP-3172	3-in-1 accessory combining kickstand, hand-strap and VFL holder (compatible with FLS-140)
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)
GP-3178	SC/APC “U-shape” Click-Out optical connector (for PRO models - to be used jointly with hands-free glove and a test cord integrated box)
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)
Test cord integrated box	
TCBI-SM-SCA-SCA-20	SC/APC to SC/APC (SM fiber, 20m - for PRO models with U-shape Click-out and hands-free glove)
TCBI-SM-SCA-SCU-20	SC/APC to SC/UPC (SM fiber, 20m - for PRO models with U-shape Click-out and hands-free glove)

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

Optical Explorer starter kit

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

OX1-XX-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
PRO-M-PPM = Maintenance – 1650 nm (live) PRO version with inline dual-band power checker

Optional permanent connection kit
PCK-PRO = Permanent connection kit with hands-free glove, SC/APC U-Shape click-out optical connector, test cord integrated box
00 = Without permanent connection kit

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

Optional test cord box [b]
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)

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

a. Fixed connector on Basic model: Fixed connector interface; on Pro model without PCK-PRO option: Click-Out optical connector interface; on PRO model with PCK-PRO option: output of test cord integrated box.
b. Not available if PCK-PRO is selected

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

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