FLUKE networks

OptiFiber® Pro OTDR

Built for the enterprise

As enterprise networks and data center architectures evolve, IT infrastructure administrators demand better OTDR technology to maintain fiber network performance. OTDRs designed for Telco networks are no longer acceptable as they are purpose-built for users with extensive optical background and training. Network engineers, Storage Area Network (SAN) designers and cable installers require an easy-to-use and efficient OTDR to minimize network down time.

The OptiFiber Pro OTDR will:

- *Accelerate fiber certification with trace times as short as two seconds in Quick Test mode*
- *Maximize efficiency with a smartphone user interface that allows anyone to perform expert fiber troubleshooting and certification*
- *Quickly test data center fiber with pre-programmed settings*
- *Troubleshoot data center fiber links with short patch cables and many connectors*
- *Easily characterize all connectors, splices and areas of high loss with graphical EventMap™ view*
- *Increase return on investment by enabling OTDR project sharing among users and different jobs*
- *Reduce network downtime by quickly and precisely identifying faults on all fiber types*
- *Facilitate results reporting and management with integrated LinkWare™ software to generate detailed and standards compliant*

Designed for enterprise fiber

Many OTDRs (Optical Time Domain Reflectometers) used for fiber troubleshooting are designed for carriers and contain cumbersome and complicated features that enterprise users don't need. Few OTDRs are built with features and usability for enterprise network engineers, SAN designers and cable installers.

As enterprises consume more storage resources and adopt higher bandwidth (40G, 100G) data center architectures, the resilience of the cabling infrastructure becomes highly dependent upon maintenance tools to ensure fiber reliability. OptiFiber Pro is the industry's first purpose-built OTDR that meets the unique challenges of an enterprise fiber infrastructure. With its simple smartphone user interface and powerful feature set, the OptiFiber Pro turns anyone into an efficient and expert premise fiber troubleshooter or installer.

Benefits

- Increases the reliability and availability of data center and storage area networks
- Maximizes operator efficiency with task focused, simplified usability
- Enhances productivity with fast trace times, one-button set ups and integrated reporting
- Saves money by reducing expensive OTDR training and detailed trace analysis
- Eliminates the need to invest in a second OTDR to troubleshoot LAN and campus networks

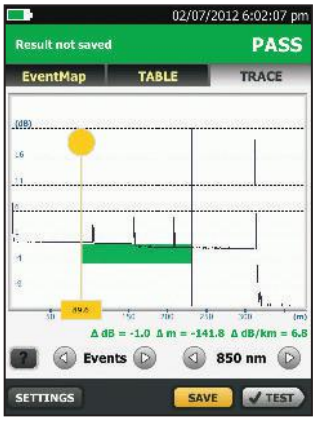
The industry's first enterprise fiber troubleshooting and certification tool

Smartphone user interface

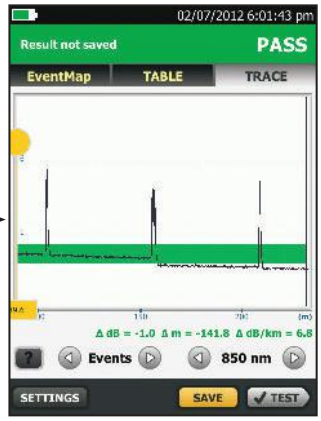
Most OTDRs are designed for a myriad of applications, causing the user interface to be difficult to navigate and interpret. OptiFiber Pro combines the latest "gesture-based" interface technology with a capacitive touchscreen to deliver the most innovative and user-friendly OTDR.

Advantages:

- Single-touch tap and swipe control for selecting and scrolling menu items
- Multi-touch pinch to zoom for easy magnification control on a graphical fiber trace
- Task-focused design to reduce back and forth navigation through screens
- Capacitive touchscreen eliminates the need to recalibrate unlike legacy touchscreens
- Context sensitive on-screen help that gives users additional details or problem resolution suggestions



Trace test result



Trace test result - zoomed in

Optimized for the data center

Driven by server virtualization and multi-gigabit links between servers, networks and storage, the data center architecture employs more patch cords and dense topology connectors, rendering carrier-class OTDRs with long dead-zones ineffective. OptiFiber Pro not only makes fiber deployment in data centers possible, but provides the highest level of accuracy for quick problem resolution.

Advantages:

- Ultra-short event and attenuation dead-zones precisely locates events and faults on fiber links
- DataCenter OTDR™ mode automatically sets the configuration to quickly test data center fiber
- The EventMap feature depicts fiber events in a way that requires no trace analysis expertise

Unique certification with flexibility and efficiency

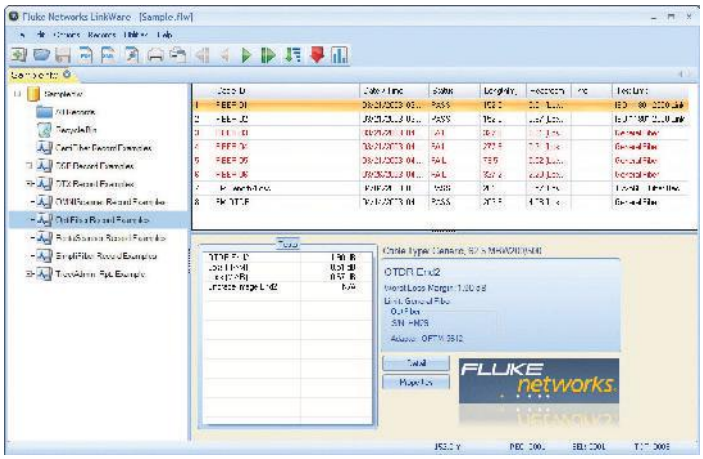
An important aspect in maximizing an OTDR's value is to properly plan its day-to-day usage. With built-in project management, OptiFiber Pro allows a project manager to define each user's role, settings and the associated tasks to be performed – transforming the OTDR into an all-in-one fiber testing tool complete with planning, inspection, certification and reporting.

Advantages:

- Full OTDR capability that certifies fiber performance based on industry standards or customer specifications
- Powerful project management facilitates OTDR sharing with clear job assignment for each operator
- Easy monitoring of job progress with pass/fail results
- Built-in Visual Fault Locator (VFL) to facilitate troubleshooting
- On-screen report generation and upload to LinkWare™ application

LinkWare™ management software

Leveraging the popular and multi-featured LinkWare cable test management software application, OptiFiber Pro users can easily access the hassle-free project management, report generation, and software upgrade capabilities to manage workflow and consolidate test results.



LinkWare management software

Key features

Extremely short event and attenuation dead zone

The OptiFiber Pro leverages the most sophisticated optical technology to provide the shortest event dead zone (0.5 m typical for MM) and attenuation dead zone (2.2 m typical for MM and 3.6 m typical for SM) of any OTDR. This technological advancement allows OptiFiber Pro to detect and measure closely spaced faults where no other OTDR can in today's connector-rich data center and storage area environments.

Two second trace per wavelength

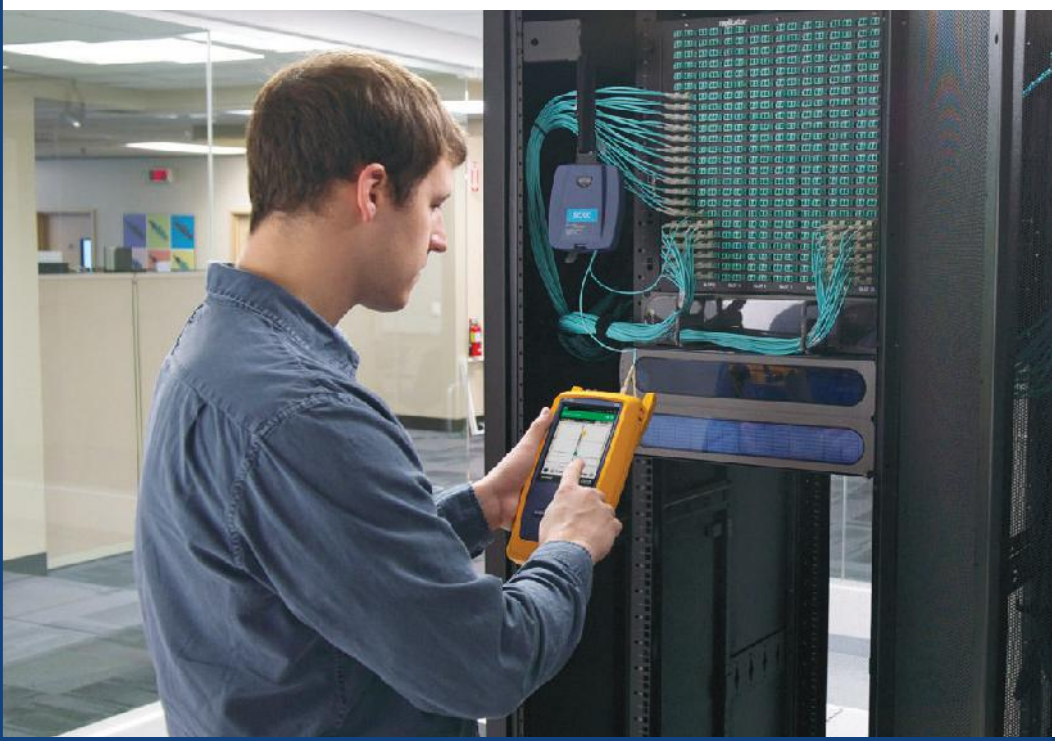
Another breakthrough with OptiFiber Pro is the data acquisition speed. While in Quick Test mode, a complete set of data is acquired in as little as two seconds per wavelength. OptiFiber Pro then analyzes the data and displays it as an EventMap event, Table or Trace. The end result is less time spent testing and more time performing other tasks.

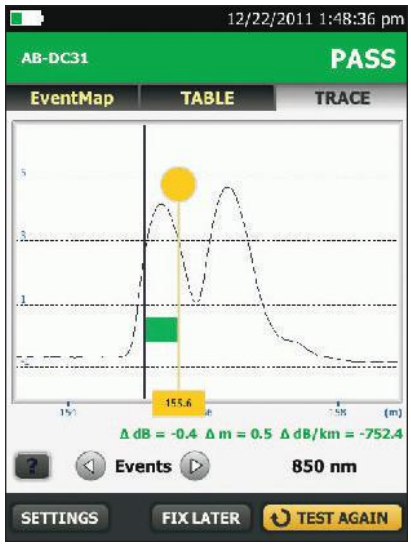
DataCenter OTDR™ mode

With a simple one-touch selection, users enter DataCenter OTDR mode – without setup time for fine tuning as needed in legacy OTDRs. DataCenter OTDR mode automatically detects OTDR parameters – end-detection algorithms, pulse widths, etc – without getting confused by the short links or number of connectors.

Graphical EventMap™ view

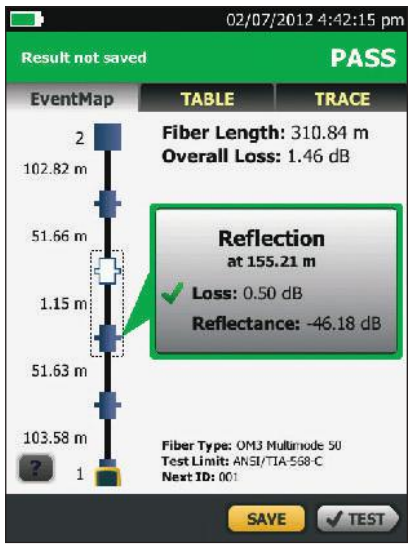
To eliminate the learning curve associated with reading an OTDR trace, OptiFiber Pro's advance logic automatically interprets the information to create a detailed and graphical map of events that includes connectors, splices and anomalies. To accommodate different preferences, users can easily switch between the EventMap, the Event Table and the Trace for test details. Any faulty events will be highlighted with RED icons to facilitate quick troubleshooting.





Extremely short event and attenuation dead zone

DataCenter OTDR mode



Graphical EventMap view

Key features (continued)

Dynamic project and user profile management

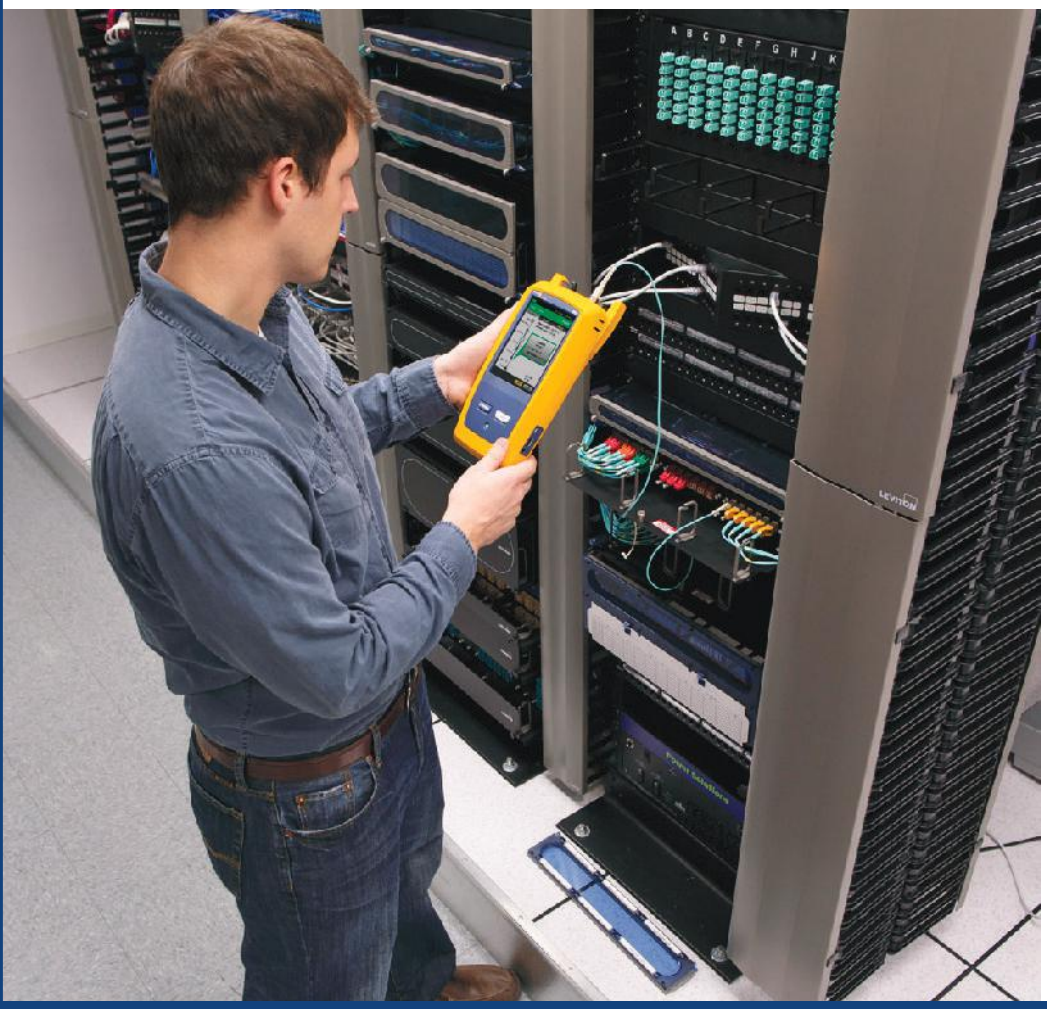
OptiFiber Pro enhances job efficiency by allowing the workflow planner to create and manage operator and job profiles per project – defined jobs or sets of cable IDs can be assigned to specific operators. The progress and status of each project can also be easily monitored.

On-screen help – corrective action

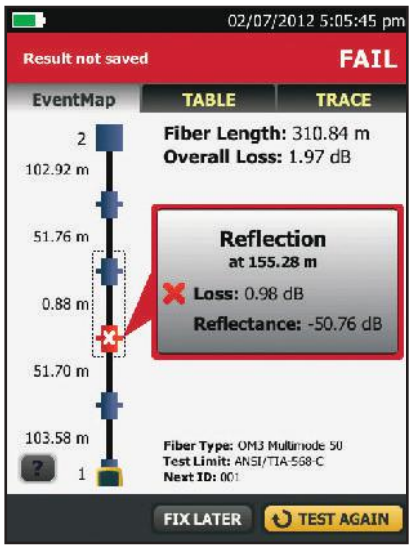
On-screen "help" suggests corrective action(s) for resolving fiber problems during each testing step. The "help" offered is context sensitive which allows users to quickly pinpoint possible resolutions. An easy-to-read, gray icon in the bottom, left-hand corner shows detailed corrective action recommendations.

FiberInspector™ probe

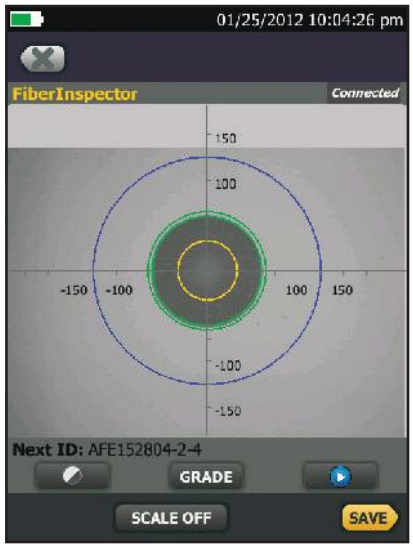
OptiFiber Pro's video inspection system examines patch cords and patch panel bulkheads to avoid the number one cause of fiber link failure – contamination. Significant time is saved because the probe is inserted directly into the patch panel's bulkhead to examine installed fiber terminations without disassembling the patch panel. Technicians assign a pass or fail grade to the fiber, append a comment and save it for use in certification reports.



Dynamic project and user profile management



EventMap view with on-screen help



FiberInspector probe

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Key OTDR specifications

	Multimode module	Singlemode module	Quad module
Wavelengths	850 nm +/- 10 nm 1300 nm +35/-15 nm	1310 nm +/- 25 nm 1550 nm +/- 30 nm	850 nm +/- 10 nm 1300 nm +35/-15 nm 1310 nm +/- 25 nm 1550 nm +/- 30 nm
Compatible fiber types	50/125 µm 62.5/125 µm	Singlemode	50/125 µm 62.5/125 µm Singlemode
Event dead zone [1]	850 nm: 0.5 m (typical) 1300 nm: 0.7 m (typical)	1310 nm: 0.6 m (typical) 1550 nm: 0.6 m (typical)	850 nm: 0.5 m (typical) 1300 nm: 0.7 m (typical) 1310 nm: 0.6 m (typical) 1550 nm: 0.6 m (typical)
Attenuation dead zone [2]	850 nm: 2.2 m (typical) 1300 nm: 4.5 m (typical)	1310 nm: 3.6 m (typical) 1550 nm: 3.7 m (typical)	850 nm: 2.2 m (typical) 1300 nm: 4.5 m (typical) 1310 nm: 3.6 m (typical) 1550 nm: 3.7 m (typical)
Dynamic range [3, 5, 6]	850 nm: 28 dB (typical) 1300 nm: 30 dB (typical)	1310 nm: 32 dB (typical) 1550 nm: 30 dB (typical)	850 nm: 28 dB (typical) 1300 nm: 30 dB (typical) 1310 nm: 32 dB (typical) 1550 nm: 30 dB (typical)
Max distance range setting	40 km	130 km	MM: 40 km SM: 130 km
Distance measurement range [4, 5, 7, 8, 9, 10]	850 nm: 9 km 1300 nm: 35 km	1310 nm: 80 km 1550 nm: 130 km	850 nm: 9 km 1300 nm: 35 km 1310 nm: 80 km 1550 nm: 130 km
Reflectance range [4, 5]	850 nm: -14 dB to -57 dB (typical) 1300 nm: -14 dB to -62 dB (typical)	1310 nm: -14 dB to -65 dB (typical) 1550 nm: -14 dB to -65 dB (typical)	850 nm: -14 dB to -57 dB (typical) 1300 nm: -14 dB to -62 dB (typical) 1310 nm: -14 dB to -65 dB (typical) 1550 nm: -14 dB to -65 dB (typical)
Sample resolution	3 cm to 400 cm	3 cm to 400 cm	3 cm to 400 cm
Pulse widths (nominal)	850 nm: 3, 5, 20, 40, 200 ns 1300 nm: 3, 5, 20, 40, 200, 1000 ns	3, 10, 30, 100, 300, 1000, 3000, 10000, 20000 ns	850 nm: 3, 5, 20, 40, 200 ns 1300 nm: 3, 5, 20, 40, 200, 1000 ns 1310/1550 nm: 3, 10, 30, 100, 300, 1000, 3000, 10000, 20000 ns
Test time (per wavelength)	Auto setting: 5 sec (typical)	Auto setting: 10 sec (typical)	Auto setting: MM - 5 sec (typical) SM – 10 sec (typical)
	Quick test setting: 2 sec (typical)	Quick test setting: 5 sec (typical)	Quick test setting: MM – 2 sec (typical) SM – 5 sec (typical)
	Best resolution setting: 2 to 180 sec	Best resolution setting: 5 to 180 sec	Best resolution setting: MM – 2 to 180 sec SM – 5 to 180 sec
	FaultMap setting: 2 sec (typical), 180 sec (max)	FaultMap setting: 10 sec (typical), 180 sec (max)	FaultMap setting: MM – 2 sec (typical) MM – 180 sec (max) SM – 10 sec (typical) SM – 180 sec (max)
	DataCenter OTDR setting: 1 sec (typical at 850 nm), 7 sec (max)	DataCenter OTDR setting: 20 sec (typical), 40 sec (max)	DataCenter OTDR setting: MM – 1 sec (typical at 850 nm) MM – 7 sec (max) SM – 20 sec (typical) SM – 40 sec (max)
	Manual setting: 3, 5, 10, 20, 40, 60, 90, 120, 180 sec	Manual setting: 3, 5, 10, 20, 40, 60, 90, 120, 180 sec	Manual setting: MM - 3, 5, 10, 20, 40, 60, 90, 120, 180 sec SM - 3, 5, 10, 20, 40, 60, 90, 120, 180 sec

1. Measured at 1.5 dB below non-saturating reflection peak with the shortest pulse width. Reflection peak < -40 dB for multimode and < - 50 dB for singlemode.
2. Measured at +/- 0.5 dB deviation from backscatter with the shortest pulse width. Reflection peak < -40 dB for multimode and < - 50 dB for singlemode.
3. For typical backscatter coefficient for OM1 fiber: 850: -65 dB, 1300: -72 dB.
4. Typical backscatter and attenuation coefficients for OM2-OM4 fiber: 850 nm: -68 dB; 2.3 dB/km: 1300 nm: -76 dB; 0.6 dB/km.
5. Typical backscatter and attenuation coefficients for OS1-OS2 fiber: 1310nm : -79 dB; 0.32 dB/km; 1550 nm: -82 dB; 0.19 dB/km.
6. SNR=1 method, 3 minute averaging, widest pulse width.
7. 850 = 9 km typical to find the end or 7 km typical to find a 0.1 dB event (with a maximum of 18 dB attenuation prior to the event).
8. 1300 = 35 km typical to find the end or 30 km typical to find a 0.1 dB event (with a maximum of 18 dB attenuation prior to the event).
9. 1310 = 80 km typical to find the end or 60km typical to find a 0.1 dB event (with a maximum of 20 dB attenuation prior to the event).
10. 1550 = 130 km typical to find the end or 90 km typical to find a 0.1 dB event (with a maximum of 18 dB attenuation prior to the event).
11. Does not include index of refraction error and does not include automatic event location error.
12. dB variation per 1 dB step.
13. Applies along the trace backscatter within the distance range in which the OTDR can find a 0.1 dB event.

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Additional key specifications

FiberInspector probe specification	
Magnification	~ 200X with OptiFiber Pro Display
Light source	Blue LED
Power source	TFS mainframe
Field of View (FOV)	Horizontal: 425 µm Vertical: 320 µm
Minimum detectable particle size	0.5 µm
Dimensions	Approximately 6.75 in x 1.5 in (1175 mm x 35 mm) without adapter tip
Weight	200 g
Temperature range	Operating: 32°F to 122°F (0 °C to +50 °C) Storage: -4°F to +158°F (20°C to +70°C)
Certifications	CE (when used with the mainframe)

VFL specifications	
On/Off control	Mechanical switch and a button on the touch screen
Output power	316 µw (-5 dBm) ≤ peak power ≤ 1.0 mw (0 dBm)
Operating wavelength	650 nm nominal
Spectral width (RMS)	±3 nm
Output modes	Continuous wave Pulsed mode (2 Hz to 3 Hz blink frequency)
Connector adapter	2.5 mm universal
Laser safety (classification)	Class II CDRH Complies to EN 60825-2

For complete kit configurations, please visit www.flukenetworks.com/orderopro

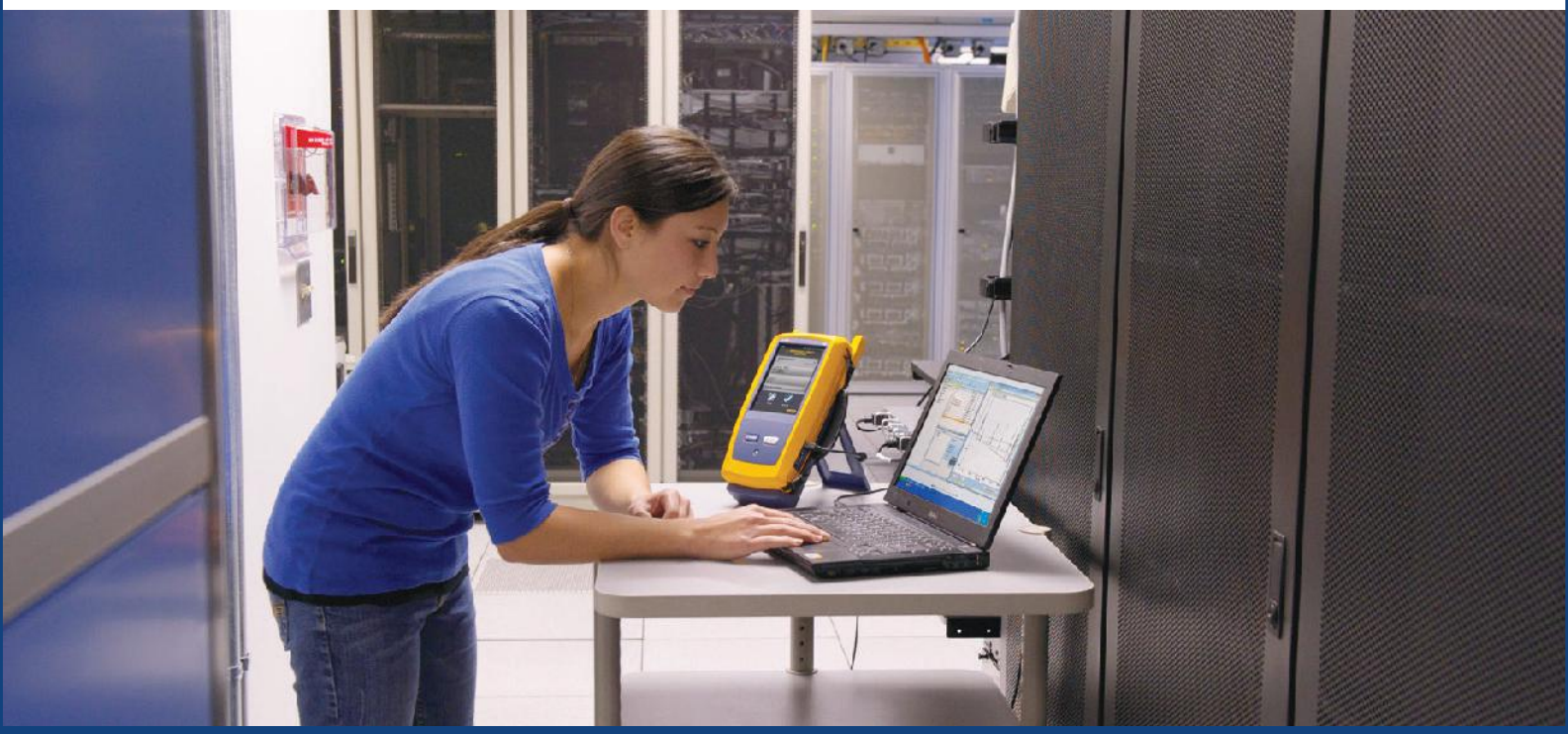
Technical specifications

General specifications	
Weight	Mainframe with module and battery: 3 lbs, 5 oz (1.28 kg)
Dimensions	Mainframe with module and battery: 2.625 in x 5.25 in x 11.0 in (6.67 cm x 13.33 cm x 27.94 cm)
Battery	Lithium ion battery pack, 7.2 volts
Battery life	Four hours to charge from 10% capacity to 90% capacity with tester off

Environmental specifications	
Operating temperature*	-18°C to 45°C
Non-operating temperature	-30°C to 60°C
Operating altitude	4,000 m (13,123 ft) 3,200 m (10,500 ft) with AC adapter
Storage altitude	12,000 m
EMC	EN 61326-1

* Using battery power. With AC power: 0°C to 45°C. Real Time Trace function used for no more than 5 minutes in a 15-minute period. Maximum ambient temperature is 35°C for continuous use of the Real Time Trace function.

* Do not keep battery at temperatures below -20°C (-4°F) or above 50°C (122°F) for periods longer than one week to maintain battery capacity.



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OptiFiber Pro ordering information

Model	Description
OFP-100-M	OptiFiber Pro Multimode OTDR kit
OFP-100-MI	OptiFiber Pro Multimode OTDR with inspection kit
OFP-100-S	OptiFiber Pro Singlemode OTDR kit
OFP-100-SI	OptiFiber Pro Singlemode OTDR with inspection kit
OFP-100-Q	OptiFiber Pro Quad OTDR kit
OFP-100-QI	OptiFiber Pro Quad OTDR with inspection kit
OFP-MM	OptiFiber Pro Multimode OTDR module
OFP-SM	OptiFiber Pro Singlemode OTDR module
OFP-QUAD	OptiFiber Pro Quad OTDR module
OFP-FI	DI-1000 Inspector with selective bulkhead and video probe tip set FI1000-TIP-KIT
TFS	TFS mainframe with battery

Accessories	Description
MMC-50-SCSC	Multimode launch cable 50µm SC/SC
MMC-50-SCLC	Multimode launch cable 50µm SC/LC
MMC-50-SCST	Multimode launch cable 50µm SC/ST
MMC-50-SCFC	Multimode launch cable 50µm SC/FC
MMC-50-SCE2K	Multimode launch cable 50µm SC/E2K
MMC-62-SCSC	Multimode launch cable 62.5µm SC/SC
MMC-62-SCLC	Multimode launch cable 62.5µm SC/LC
MMC-62-SCST	Multimode launch cable 62.5µm SC/ST
MMC-62-SCFC	Multimode launch cable 62.5µm SC/FC
SMC-9-SCSC	Singlemode launch cable 9µm SC/SC
SMC-9-SCLC	Singlemode launch cable 9µm SC/LC
SMC-9-SCST	Singlemode launch cable 9µm SC/ST
SMC-9-SCFC	Singlemode launch cable 9µm SC/FC
SMC-9-SCE2KAPC	Singlemode launch cable 9µm SC/E2000 APC
PA-SC	OTDR source port interchangeable SC adapter
PA-LC	OTDR source port interchangeable LC adapter
PA-ST	OTDR source port interchangeable ST adapter
PA-FC	OTDR source port interchangeable FC adapter
TFS-BAT	TFS battery
TFS-CHGR	TFS AC adapter/charger, international
TFS-KIT-CASE	OFP soft case
TFS-HSTRAP	TFS hand strap
TFS-USB-CBL	USB interface cable standard A to micro B

FiberInspector probe models and accessories

Model	Description
FI1000	DI-1000 FiberInspector USB video probe for OptiFiber Pro
FI1000-SCFC-TIP	SC and FC bulkhead video probe tip
FI1000-TIP-KIT	LC, FC/SC Bulkhead, 1.25 and 2.5 mm universal tips in a box
FI1000-LC-TIP	LC bulkhead video probe tip
FI1000-ST-TIP	ST bulkhead video probe tip
FI1000-MU-TIP	MU bulkhead video probe tip
FI1000-E2KAPC-TIP	E2000/APC bulkhead video probe tip
FI1000-SCAPC-TIP	SC/APC bulkhead video probe tip
FI1000-E2K-TIP	E2000 bulkhead video probe tip
FI1000-LCAPC-TIP	LC/APC bulkhead video probe tip
FI1000-2.5-UTIP	2.5mm universal video probe tip for patch cords
FI1000-1.25-UTIP	1.25mm universal video probe tip for patch cords
FI1000-2.5APC-UTIP	2.5mm APC universal video probe tip for patch cords
FI1000-MPO-UTIP	MPO/MTP probe tip and translator knob for patch cords and bulkheads
FI1000-MPOAPC-UTIP	MPO/APC probe tip and translator knob for patch cords and bulkheads
FI1000-1.25APC-TIP	1.25mm APC universal video probe tip for patch cords

For a complete listing of OptiFiber Pro models and accessories, visit **www.flukenetworks.com/OPRO**

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