

# FTB-7000

## OTDR Series

NETWORK TESTING – OPTICAL



### Powerful OTDRs covering all network testing applications

- Deploy faster with short acquisition time
- Reduce training time with an easy-to-use graphical user interface (GUI)
- Locate closely spaced events with 0.8 m dead zones
- Test ultra-long links with dynamic range up to 50 dB
- FTTx ready: passive optical network (PON) and point-to-point testing capabilities
- 40 Gbit/s ready: metro and long-haul network testing capabilities

### Platform compatibility

- FTB-200 Compact Platform
- FTB-400 Universal Test System
- FTB-500 Platform



## A Complete Line of OTDRs for Any Testing Situation

Today's telecom market imposes test challenges that stem from a never-before seen variety of fiber-optic architectures. Long-haul, high-fiber-count 10 Gbit/s to 40 Gbit/s and high-speed dense wavelength-division multiplexing (DWDM) networks; coarse wavelength-division multiplexing (CWDM) and 2.5 Gbit/s metropolitan rings; passive optical networks (PONs), multidwelling units (MDUs) and other types of access networks—all of these create increasingly specific and demanding testing requirements, making OTDRs more essential than ever for installing, maintaining and troubleshooting optical links.

EXFO's FTB-7000 series delivers the right tools for accurately detecting and characterizing splices, connectors, splitters, breaks and other events along the fiber, providing a wide choice of configurations to conveniently test all types of networks. They combine up to four wavelengths in a single module, offering extremely short dead zones—perfect for short-distance applications—and faster-than-ever acquisitions.

EXFO's OTDR modules meet all your testing needs with numerous single mode and multimode configurations available at several wavelengths. Most importantly, they are field-interchangeable and compatible with EXFO's rugged, portable test platforms, the powerful FTB-500 Platform, the FTB-400 Universal Test System and the FTB-200 Compact Platform.



The FTB-7200, FTB-7300, FTB-7400, FTB-7500 and FTB-7600 OTDR modules.



OTDR modules are housed in EXFO's rugged field-testing platforms, the FTB-200, the FTB-400 and the FTB-500, the latter being shown with a "link characterization" module set that includes an OTDR.



EXFO's OTDR modules deliver smooth performance both in inside-plant and outside-plant applications.

### Get the Right Fit

- Various models and configurations, for first-class testing flexibility
- Singlemode modules: 1310, 1383, 1490, 1550 and 1625 nm
- Multimode modules: 850 and 1300 nm
- Four-wavelength multimode and single mode modules
- Great resolution with 4 cm spacing and up to 256 000 sampling points
- Dynamic range of up to 50 dB
- PON/MDU-optimized for testing up to 1:64 splitter ratio
- EXFO universal interface (EUI) connector: UPC- and APC-compatible
- Visual fault locator (VFL) option, ideal for troubleshooting LAN/WAN and metro networks



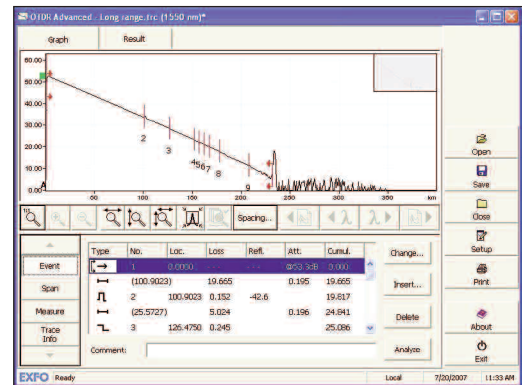
## The New FTB-7600E OTDR: For Powerful **Ultra-Long-Haul** Testing

When distance is an issue, the new FTB-7600E OTDR, with a dynamic range of up to 50 dB, is the solution. Taking full advantage of EXFO's industry-leading expertise in OTDR development, this module can test over distances of up to 250 km.

Thanks to its unmatched linearity of  $\pm 0.03$  dB/dB, this new OTDR accurately locates faults on ultra-long links—without compromising on resolution and distance. It is offered in single and dual wavelength configurations (1310/1550/1625 nm).

This combination of quality and power makes the FTB-7600E an excellent choice for companies deploying and maintaining ultra-long-haul networks.

- Up to 256 000 sampling points for higher trace resolution
- Dynamic range of up to 50 dB
- Linearity of  $\pm 0.03$  dB/dB (the best in the industry)



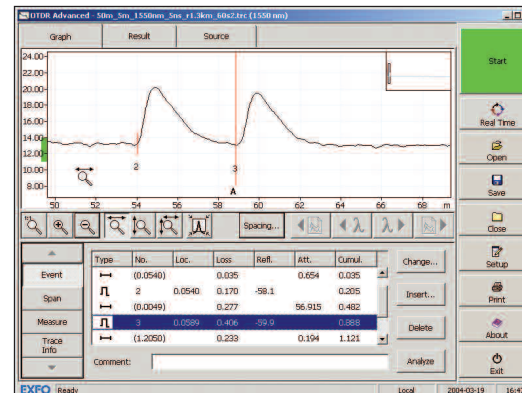
EXFO's FTB-7600E precisely characterizes fiber links up to 250 km.

## The FTB-7400E and FTB-7500E OTDRs: No-Compromise Versatility for **Metro/Long-Haul** Testing

Today's fiber networks integrate metro and long-haul applications, making OTDR versatility a must. While long-haul architectures require high dynamic range values to reach greater distances, metro links demand an OTDR offering a good resolution (short dead zones) due to the proximity of many connection points. Up to now, OTDR users had to compromise on one or the other and buy two units—a choice that they no longer have to make.

The new FTB-7400E and FTB-7500E OTDRs combine EXFO's renowned optical performance and unparalleled software analysis with both short dead zones and high dynamic range values, delivering the versatility needed to test metro and long-haul links with a single OTDR.

- Up to 256 000 sampling points for higher trace resolution
- Event dead zone of 0.8 m and attenuation dead zone of 4 m for pinpoint event location
- Low-water-peak fiber testing at 1383 nm for characterizing new fiber or assessing the degradation of legacy fiber
- Up to four test wavelengths (1310/1383/1550/1625 nm) for legacy, CWDM and DWDM link characterization
- Dynamic range of up to 45 dB for long-haul testing



The FTB-7000E OTDR's market-leading dead zone enables the full characterization of a typical tie-cable—as short as 4.5 m with UPC connectors (reflectance below -45 dB).

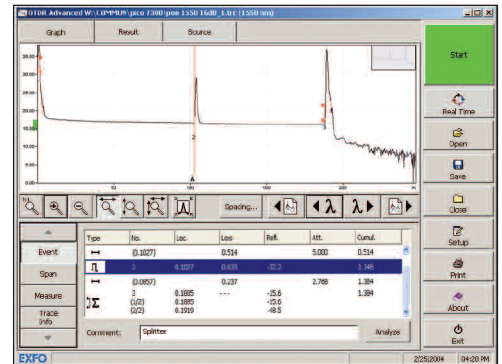
# FTB-7200D OTDR: Designed for **Access** and **LAN/WAN** Test Applications

## Short Dead Zones

EXFO's FTB-7200D OTDR helps you boost test productivity for inside-plant applications. Its exceptional 1 m event dead zone enables you to easily locate and characterize all events between the transmitter and the central office's fiber distribution panel. This feature also comes in handy in access and LAN/WAN network applications, where events are usually closely spaced.

## Multimode and Single mode Flexibility

The FTB-7200D model combines single mode and multimode functionalities, ideal for private/premises/enterprise network testing. It offers the industry's shortest dead zones, as well as lightning-fast acquisitions. Test multimode fiber within premises or singlemode fiber between premises—all with a single OTDR unit—and maximize your return on investment.



EXFO's FTB-7200D-QUAD version enables private/premises/enterprise testing at once by combining single mode and multimode functionalities—maximizing your ROI.

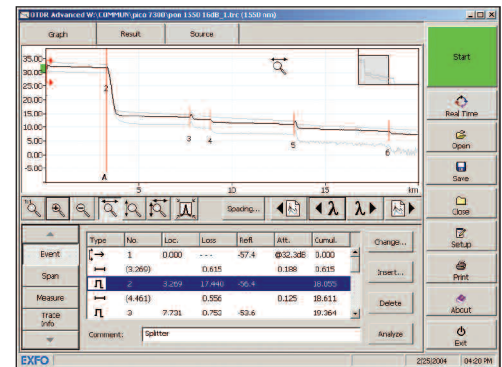
# FTB-7300E OTDR: Cutting-Edge FTTx Testing

## Optimizing Passive Optical Network (PON) Testing

Designed to meet the testing requirements brought by FTTx networks in general, and PONs/MDUs in particular, the FTB-7300E enables testing at 1310, 1490, 1550 and 1625/1650 nm. What's more, EXFO's next-generation OTDR software lets you test through high-port-count splitters—even 1x64 splitters—with loss levels of up to 21 dB.

## In-Service Troubleshooting

The flexibility to add a single mode live testing port for in-service troubleshooting enables you to fix a problematic distribution fiber while the others are still active. Its filtered port blocks incoming transmission signals and its out-of-band wavelength will not interfere in your network. Maintaining an excellent quality of service (QoS), it will also ease the troubleshooting testing steps.



EXFO's FTB-7300E FTTx-PON/MDU OTDR easily tests through high-port count splitters with high loss levels.

# EXFO's OTDR Software: Boosting Productivity in the Field

## Advanced and Auto Modes: Choose Your Testing Approach

Streamline data acquisition in the field and report generation back at the office with EXFO's powerful OTDR software. Choose from two testing approaches: Advanced mode or Auto mode.

## Advanced Mode: Flexibility for Experts

For complete control over your test routine, select the Advanced mode. Manually set all acquisition parameters, including the index of refraction (IOR) and helix factor. Save time and get better results by fine-tuning acquisition parameters on the fly.

## Auto Mode: One-Touch Testing

Ideal for basic, repetitive applications, the Auto mode shortens the learning curve for new OTDR users.

- Preset test parameters
- Choice of single- or dual-wavelength OTDR testing
- Convenient one-step event table

1- Select Auto mode

2- Click on Start

3- Get the results

## As easy as 1-2-3!

- Press the Start button for automatic OTDR testing and test result compilation on up to four wavelengths.
- Quick Save with automated trace-naming completes the test routine.
- Quick Print produces a detailed test report.

# General OTDR Software Features

## Great Display Legibility for Outdoors Work

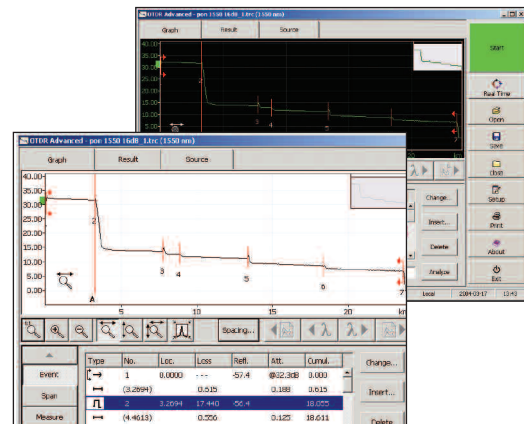
For installation and maintenance crews, working outdoors goes with the territory. Switch between black and white display backgrounds as needed and enjoy great legibility—even in the brightest daylight.

## Smooth Data Management

This feature combines file autonaming with subset cable and fiber incrementation.

## Universal OTDR Compatibility

Based on the universal Bellcore format (.sor, Telcordia SR-4731), the software lets you access OTDR traces from various test and measurement manufacturers. You can therefore use the FTB-200, the FTB-400 or the FTB-500 and still refer to your previously archived OTDR files.

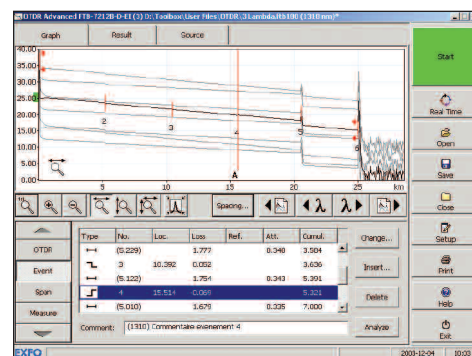


Great display legibility for outdoors work.

## FTB-400 and FTB-500 Platform OTDR Software Feature

### Multiple-Trace Comparison

Multiple-trace viewing lets you quickly compare traces and detect anomalies within fibers of a tube, a ribbon or even a whole cable.

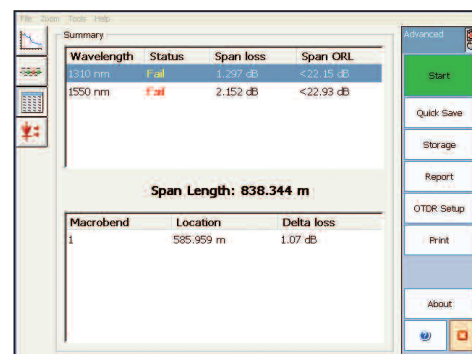


Multiple-trace comparison on the FTB-500.

## FTB-200 Platform OTDR Software Features

### Summary Screen

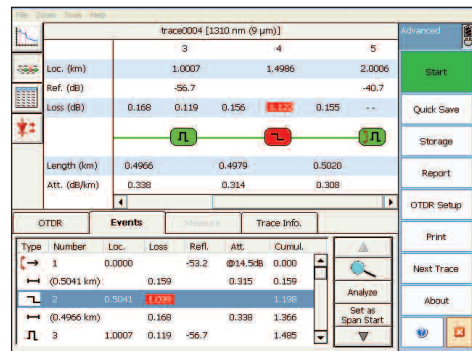
View—at a glance—the pass/fail status for each tested wavelength. What's more, the software automatically detects macrobends, which are also displayed in the summary screen.



Summary screen.

### Linear Trace View

This feature virtually eliminates the need to analyze complex OTDR graphs. It provides a straightforward display of all events and related loss and ORL values. Easily toggle between OTDR traces and the linear view.



Linear trace view.

## Fast-Track Data Post-Processing with FastReporter Software



The optional FastReporter software package provides you with the post-processing tools and functionalities you need to meet such challenges, whatever the application. Designed for **off-line analysis of field-acquired data**, FastReporter offers a truly intuitive graphical user interface, which contributes to boosting productivity.

### Powerful Batch Processing

Automate repetitive operations on large numbers of OTDR test files and optimize your productivity. Document an entire cable in a matter of seconds. Adjust your cable parameters and detection thresholds and perform batch analysis. Open OTDR files from various vendors' equipment and convert them to the universal Telcordia format.

### Bidirectional Batch Analysis

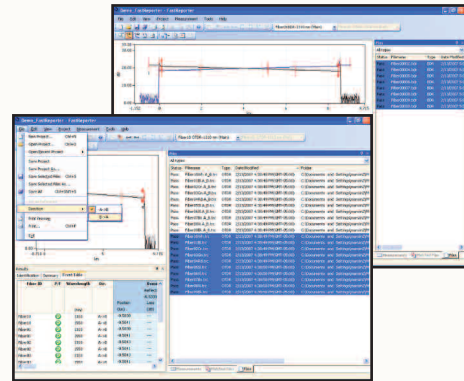
Analyze an entire cable in just two steps. View data for all events on all fibers, and at each wavelength, on a single screen.

### Live Templating for OTDR Testing

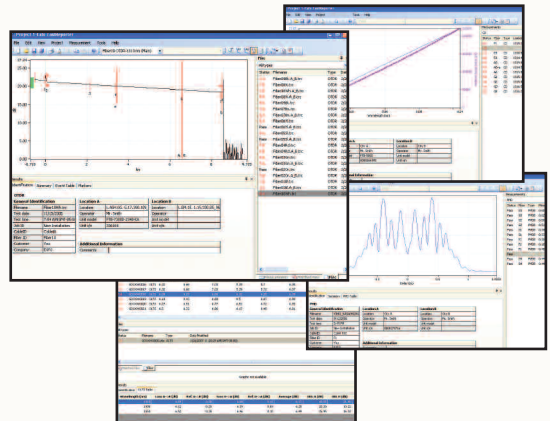
Benefit from one-step file management at any wavelength. Keep full control by adding or removing events manually, or add/remove events automatically using a reference. Get uniform, detailed cable reports.

### Flexible Reporting

Choose from various report templates, including loss and ORL, OTDR, PMD, CD and fiber characterization. Generate comprehensive cable reports in PDF, Excel or HTML format.



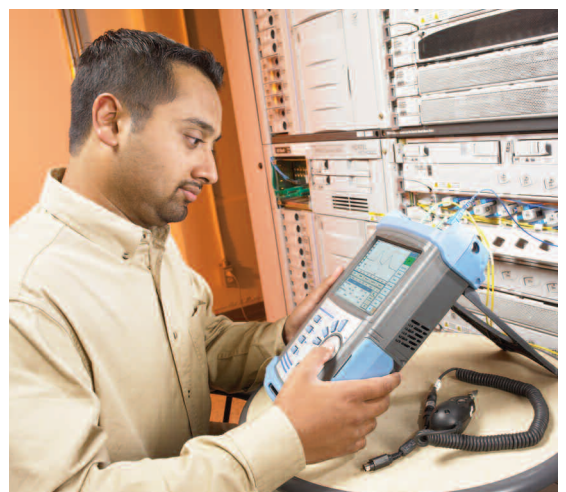
■ Bidirectional batch analysis.



## Time Savers from EXFO's OTDR Viewer Software

This free software brings you key data post-processing features such as:

- Pass/warning/fail threshold setup, which helps you meet ribbon and multifiber validation specifications
- Bidirectional trace analysis, which provides more accurate, averaged loss measurements for each event
- Multifiber testing using the Template Trace mode, which dynamically compares new OTDR results with a trace you assign as a reference



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

### SPECIFICATIONS

All specifications below apply to the FTB-7200D-12CD-23B multimode (MM)/singlemode (SM) model and the FTB-7200D-12CD multimode-only version.

Model	Wavelength (nm) <sup>a</sup>	Dynamic range <sup>b, c</sup> (dB)	Event dead zone <sup>d</sup> (m)	Attenuation dead zone <sup>d</sup> (m)
FTB-7200D-12CD	850 ± 20/1300 ± 20	27/26	1/1	3/4
FTB-7200D-12CD-23B	1310 ± 20/1550 ± 20	36/34	1/1	4.5/5
Distance range (km)	Multimode: 0.1, 0.3, 0.5, 1.3, 2.5, 5, 10, 20, 40 Singlemode: 1.3, 2.5, 5, 10, 20, 40, 80, 160, 260			
Pulse width (ns)	Multimode: 5, 10, 30, 100, 275, 1000 Singlemode: 5, 10, 30, 100, 275, 1000, 2500, 10 000, 20 000			
Launch conditions <sup>e</sup>	Class CPR 1 or 2			
Linearity (dB/dB)	±0.03			
Loss threshold (dB)	0.01			
Loss resolution (dB)	0.001			
Sampling resolution (m)	Multimode: 0.04 to 2.5 Singlemode: 0.04 to 5			
Sampling points	Up to 128 000			
Distance uncertainty <sup>f</sup> (m)	± (0.75 + 0.0025 % x distance + sampling resolution)			
Measurement time	User-defined (60 min maximum)			
Typical real-time refresh (Hz)	3			
Stable source output power <sup>g</sup> (dBm)	-1.5 (1300 nm), -7 (1550 nm)			
Visual fault locator (optional)	Laser, 650 nm ± 10 nm CW, typical P <sub>out</sub> in 62.5/125 µm: 3 dBm (2 mW)			

#### NOTES

- Typical.
- Typical dynamic range with longest pulse and three-minute averaging at SNR = 1.
- Multimode dynamic range is specified for 62.5 µm fiber; a 3 dB reduction is seen when testing 50 µm fiber.
- Typical dead zone for multimode reflectance below -35 dB and singlemode reflectance below -45 dB, using a 5 ns pulse.
- For multimode port, controlled launch conditions allow 50 µm and 62.5 µm multimode fiber testing.
- Does not include uncertainty due to fiber index.
- Typical output power is given at 1300 nm for multimode output and 1550 nm for singlemode output.

### SINGLEMODE OTDR MODULE SPECIFICATIONS

Model <sup>h</sup>	Wavelength <sup>i</sup> (nm)	Dynamic range at 20 µs <sup>j</sup> (dB)	Event dead zone <sup>k</sup> (m)	Attenuation dead zone <sup>k</sup> (m)
FTB-7200D-XXX	1310 ± 20/1550 ± 20	36/34	1	4.5/5
FTB-7300E-XXX-XX <sup>o</sup>	1310 ± 20/1490 ± 10/1550 ± 20/1625 ± 10/1650 ± 5	39/35/37/39/37 <sup>n</sup>	0.8	4/4.5/4.5/4.5/4.5
FTB-7400E-XXXX	1310 ± 20/1383 ± 1/1550 ± 20/1625 ± 10	42/40/41/41	0.8	4/4.5/4.5
FTB-7500E-XX <sup>l</sup>	1310 ± 20/1550 ± 20/1625 ± 10	45/45/45	0.8	4/4.5/4.5
FTB-7600E-XX	1310 ± 20/1550 ± 20/1625 ± 10	50/50/48 <sup>m</sup>	1/1.5/1	5/5/5

#### NOTES

- For complete details on all available configurations, refer to the Ordering Information section.
- Typical.
- Typical dynamic range with a three-minute averaging at SNR = 1.
- Typical dead zone of singlemode modules for reflectance below -45 dB, using a 5 ns pulse.
- Typical dynamic range at 1550 nm for the FTB-7500E-0023B configuration is 2 dB lower.
- With NZDS fiber (G.655).
- Non-SM Live 1625 nm dynamic range is 37 dB.
- SM Live port built in filter's bandpass: 1625 nm ± 15 nm/1650 nm ± 5 nm.

### GENERAL SPECIFICATIONS

	7200D	7300E-B/7400E-B/7500E-B/7600E-B
Distance range (km)	1.25, 2.5, 5, 10, 20, 40, 80, 160, 260	1.25, 2.5, 5, 10, 20, 40, 80, 160, 260, 400
Pulse width (ns) <sup>r</sup>	5, 10, 30, 100, 275, 1000, 2500, 10 000, 20 000	5, 10, 30, 100, 275, 1000, 2500, 10 000, 20 000
Linearity (dB/dB)	±0.03	±0.03
Loss threshold (dB)	0.01	0.01
Loss resolution (dB)	0.001	0.001
Sampling resolution (m)	0.04 to 5	0.04 to 5
Sampling points	Up to 128 000	Up to 256 000
Distance uncertainty <sup>p</sup> (m)	± (0.75 + 0.0025 % x distance + sampling resolution)	± (0.75 m + 0.001 % x distance + sampling resolution)
Measurement time	User-defined (60 min maximum)	User-defined (5 sec minimum to 60 min maximum)
Typical real-time refresh (Hz)	3	4
Stable source output power <sup>q</sup> (dBm)	-7 (7200D)	-2.5 (7300E), -4.5 (7400E-0023B), 1 (7500E-0034B), 5 (7600E-0023B)
Visual fault locator (optional)	Laser, 650 nm ± 10 nm CW, typical P <sub>out</sub> in 62.5/125 µm: 3 dBm (2 mW)	Laser, 650 nm ± 10 nm CW, typical P <sub>out</sub> in 62.5/125 µm: 3 dBm (2 mW)

#### NOTES

- Does not include uncertainty due to fiber index.
- Typical output power value at 1550 nm.
- FTB-7300E models include a 50 ns and 500 ns pulse width.

### LASER SAFETY

21 CFR 1040.10 AND IEC 60825-1:1993+A2:2001  
CLASS 1M WITHOUT VFL OPTION  
CLASS 3R WITH VFL OPTION



**ORDERING INFORMATION**

**Multimode and Singlemode (ACCESS and LAN/WAN OTDR)**

**FTB-7200D-XX-XX-XX**

**Model ■**

FTB-7200D-12CD-23B = Four-wavelength MM/SM OTDR module, 850/1300 nm (50/125 μm and 62.5/125 μm) and 1310/1550 nm (9/125 μm)  
 FTB-7200D-12CD = Dual-wavelength MM OTDR module, 850/1300 nm (50/125 μm and 62.5/125 μm)  
 FTB-7200D-023B = Dual-wavelength SM OTDR module, 1310/1550 nm (9/125 μm)

**Connector <sup>a</sup> ■**

EA-EUI-28 = APC/DIN 47256 <sup>b</sup>  
 EA-EUI-89 = APC/FC narrow key <sup>b</sup>  
 EA-EUI-91 = APC/SC <sup>b</sup>  
 EA-EUI-95 = APC/E-2000 <sup>b</sup>  
 EI-EUI-28 = UPC/DIN 47256  
 EI-EUI-76 = UPC/HMS-10/AG  
 EI-EUI-89 = UPC/FC narrow key  
 EI-EUI-90 = UPC/ST  
 EI-EUI-91 = UPC/SC  
 EI-EUI-95 = UPC/E-2000

**Visual fault locator**

00 = Without visual fault locator  
 VFL = With visual fault locator (universal 2.5 mm connector)

Example: FTB-7200D-12CD-23B-EI-EUI-89-EA-EUI-95-VFL

**NOTES**

- a. Please refer to the example above. First select the multimode connector, and then the single mode connector.
- b. Singlemode only.

**Singlemode (FTTx-PON/MDU)**

**FTB-7300E-XX-XX-XX**

**Model ■**

**Dual-wavelength**  
 FTB-7300E-023B = SM OTDR module, 1310/1550 nm (9/125 μm)  
 FTB-7300E-034B = SM OTDR module, 1550/1625 nm (9/125 μm)  
**Triple-wavelength**  
 FTB-7300E-234B = SM OTDR module, 1310/1550/1625 nm (9/125 μm)  
 FTB-7300E-236B = SM OTDR module, 1310/1490/1550 nm (9/125 μm)  
**SM Live Port**  
 FTB-7300E-023B-04B = SM and SM Live OTDR module, 1310/1550 and 1625 nm Live Port  
 FTB-7300E-023B-08B = SM and SM Live OTDR module, 1310/1550 and 1650 nm Live Port  
 FTB-7300E-000-04B = SM Live port OTDR module, 1625 nm Live port only

**Connector**

EA-EUI-28 = APC/DIN 47256  
 EA-EUI-89 = APC/FC narrow key  
 EA-EUI-91 = APC/SC  
 EA-EUI-95 = APC/E-2000  
 EI-EUI-28 = UPC/DIN 47256  
 EI-EUI-76 = UPC/HMS-10/AG  
 EI-EUI-89 = UPC/FC narrow key  
 EI-EUI-90 = UPC/ST  
 EI-EUI-91 = UPC/SC  
 EI-EUI-95 = UPC/E-2000

**Visual fault locator**

00 = Without visual fault locator  
 VFL = With visual fault locator (universal 2.5 mm connector)

Example: FTB-7300E-023B-04B-EI-EUI-89-VFL

**Singlemode (METRO)**

**FTB-7400E-XX-XX-XX**

**Model ■**

**Dual-wavelength**  
 FTB-7400E-0023B = SM OTDR module, 1310/1550 nm (9/125 μm)  
**Triple-wavelength**  
 FTB-7400E-0234B = SM OTDR module, 1310/1550/1625 nm (9/125 μm) <sup>a</sup>  
**Four-wavelength**  
 FTB-7400E-2347B = SM OTDR module, 1310/1383/1550/1625 nm (9/125 μm) <sup>a</sup>

**Visual fault locator** (universal 2.5 mm connector)  
 See singlemode (FTTx-PON/MDU)

**Connector**

See singlemode (FTTx-PON/MDU)

Example: FTB-7400E-2347B-EI-EUI-89-VFL

**Singlemode (METRO/LONG-HAUL)**

**FTB-7500E-XX-XX-VFL**

**Model ■**

**Dual-wavelength**  
 FTB-7500E-0023B = SM OTDR module, 1310/1550 nm (9/125 μm)  
 FTB-7500E-0034B = SM OTDR module, 1550/1625 nm (9/125 μm)

**Visual fault locator** (universal 2.5 mm connector)

**Connector**

See singlemode (FTTx-PON/MDU)

Example: FTB-7500E-0023B-EI-EUI-89-VFL

**Singlemode (ULTRA-LONG-HAUL)**

**FTB-7600E-XX-XX-VFL**

**Model ■**

**Dual-wavelength**  
 FTB-7600E-0023B = SM OTDR module, 1310/1550 nm (9/125 μm)  
 FTB-7600E-0034B = SM OTDR module, 1550/1625 nm (9/125 μm)

**Visual fault locator** (universal 2.5 mm connector)

**Connector**

See singlemode (FTTx-PON/MDU)

Example: FTB-7600E-0023B-EI-EUI-89-VFL

**NOTE:**

a. VFL always included.

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EXFO is certified ISO 9001 and attests to the quality of these products. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. 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](http://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 the EXFO website at <http://www.EXFO.com/specs>

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