

# AXS-100

## Series

NETWORK TESTING—OPTICAL



Compact, rugged, lightweight OTDRs optimized for access/FTTx and LAN/WAN network testing

- A single unit for testing singlemode as well as 50 and 62.5  $\mu\text{m}$  multimode fiber
- 850, 1300, 1310 and 1550 nm wavelengths, with respective dynamic ranges of 24, 25, 32 and 30 dB
- Unrivalled event dead zone of 0.8 m, for easy location and characterization of all events
- Top user-friendliness: one-touch testing, summary screen, macrobend finding
- Complete connectivity flexibility: USB stick compatibility and USB cable data download
- Complete test set with value-added options, including power meter, visual fault locator (VFL), fiber inspection probe, printer and IP testing



Next-Generation Network Assessment



EXPERTISE REACHING OUT

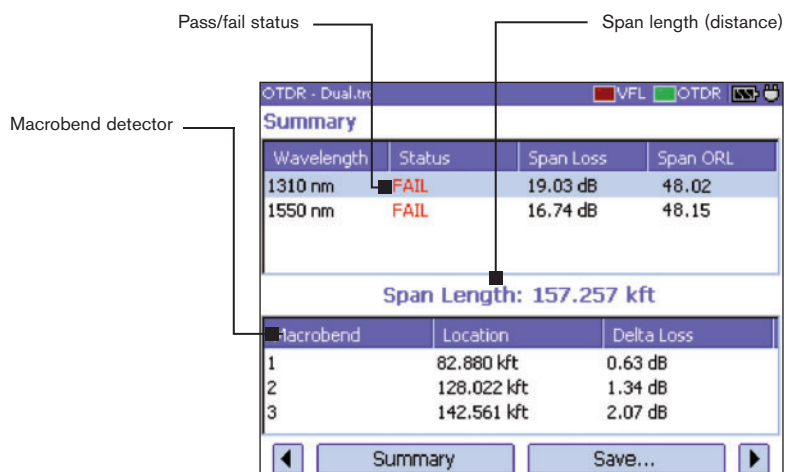
## AXS-100 Series: Four Models to Choose From

EXFO's AXS-100 Handheld OTDR series covers the whole range of short-haul OTDR test applications. Featuring unrivaled event dead zones and first-class dynamic ranges, it includes four models to better suit your specific OTDR testing requirements.

| Model                                                                                                                                     | Wavelengths           | Dynamic ranges |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------|
| <b>AXS-100 Access OTDR</b><br>Designed for singlemode OTDR troubleshooting<br>(in-service PON troubleshooting option)                     | 1310/1550/1625 nm     | 29/28/28 dB    |
| <b>AXS-110-SM Singlemode OTDR</b><br>Ideal for FTTx/access and CATV testing                                                               | 1310/1550 nm          | 32/30 dB       |
| <b>AXS-110-MM Multimode OTDR</b><br>Optimized for enterprise/premises/private network testing on both 50 and 62.5 $\mu$ m multimode fiber | 850/1300 nm           | 24/25 dB       |
| <b>AXS-110 All-Fiber OTDR</b><br>Combines singlemode and multimode capabilities for enterprise/campus/access networks                     | 850/1300/1310/1550 nm | 24/25/32/30 dB |

### Unique Advantages

- FasTrace function: one-touch testing for top user-friendliness
- 8-hour power autonomy
- Lightweight: 1 kg
- USB port (memory-stick compatible) for easy data transfer
- Large internal memory (up to 500 results)
- Transflective color display for viewing clear results under bright sunlight
- Superior automated analysis for a better, easier and faster diagnosis
- Automatic pass/fail analysis and macrobend locating
- Auto-zoom on events



The AXS-100's unique software functionalities provides in-depth results at a glance.

# The AXS-110 OTDR: the LAN/WAN Test Solution

## Easy Location and Characterization of Events

The AXS-110 OTDR models help you boost test productivity for inside-plant applications. Its exceptional 0.8 m event dead zone enables you to easily locate and characterize all events between the transmitter and the central office's fiber, access and FTTH network applications, where events are usually closely spaced.

## Multimode and Singlemode Flexibility

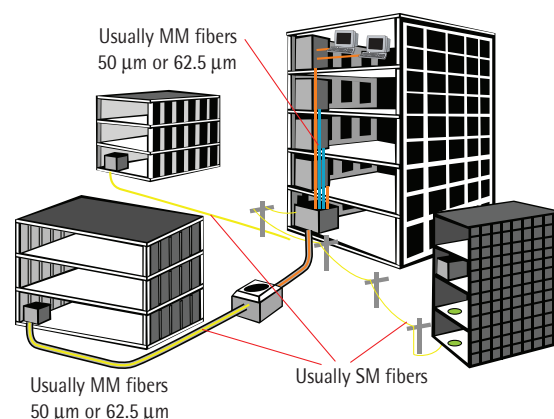
The AXS-110 All-Fiber OTDR combines singlemode and multimode functionalities, ideal for premises/private/enterprise network testing. Test multimode fiber within premises, or singlemode fiber between premises—all with a single OTDR unit—and maximize your return on investment.

## End-to-end PON Characterization

The AXS-110 OTDR models let you test through high-port-count splitters—even 1 x 32 splitters—perfect for passive optical network (PON) testing.

## AXS-110 All-Fiber OTDR: Key Advantages

- Perfect tool for tier-2 certification of premises networks
- Pass/fail features that comply with industry standards such as TIA 568c and IEEE 802.3ah
- Highest dynamic range of the industry for a handheld OTDR
- Power meter option, for crosschecking the total loss using the built-in OTDR laser in continuous source mode



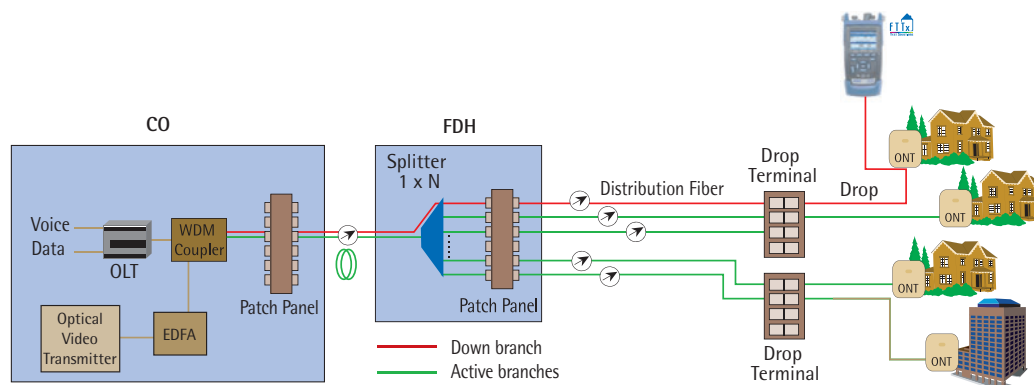
# The AXS-100 Access OTDR: the Definitive Troubleshooting OTDR

EXFO's AXS-100 Access OTDR combines the industry's leading OTDR technology with power meter functionalities in one powerful handheld unit. Optimized for point-to-point testing of passive optical networks (PON) within FTTx architectures, it offers several wavelength configurations and a wide range of options, for first-class flexibility.

## In-Service PON Troubleshooting Option

The AXS-100 Access OTDR is specifically designed for in-service PON troubleshooting. It features an optional dedicated port for testing at 1625 nm incorporating a filter that rejects all unwanted signals (1310, 1490 and 1550 nm) that could contaminate the OTDR measurement. The filter only lets through the 1625 nm OTDR signal, ensuring accurate OTDR measurements.

In-service OTDR troubleshooting of optical fiber does not interfere with the normal operation and expected performance of the information channels. EXFO's AXS-100 does not interfere with the CO's laser transmitters, as it uses an out-of-band wavelength, as per the ITU-T L.41 recommendation ("Maintenance Wavelength on Fibers Carrying Signals").



# Unique Trace Analysis Software Features, for Fast, Reliable Results

AXS-100 series OTDRs make link assessment a fast, simple task, providing unparalleled ease of use, even for technicians with little background in optical/OTDR testing. Designed for boosting OTDR testing efficiency, whether for multimode or singlemode applications, the AXS-100 software offers:

## Full access to OTDR traces from major test equipment manufacturers

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 seamlessly switch to the AXS-100 series and still refer to your previously archived OTDR files.

## Summary screen

View all your test results at once. Enjoy fail-safe OTDR post-analysis.

## Faster acquisition—five seconds

Spend less time retrieving your OTDR traces, speeding up your test cycles.

## Best-in-class software analysis

EXFO's leading expertise in OTDR testing and trace analysis lets you benefit from high-end software in a handheld unit. Focus on what's real: generate a list of all events actually present on the link.

## Auto-zoom on events

Automatically toggle between events, and get an instant zoom on an event along with its markers.

| Wavelength | Status | Span Loss | Span ORL |
|------------|--------|-----------|----------|
| 1310 nm    | FAIL   | 19.03 dB  | 48.02    |
| 1550 nm    | FAIL   | 16.74 dB  | 48.15    |

| Span Length: 157.257 kft |             |            |
|--------------------------|-------------|------------|
| Macrobend                | Location    | Delta Loss |
| 1                        | 82.880 kft  | 0.63 dB    |
| 2                        | 128.022 kft | 1.34 dB    |
| 3                        | 142.561 kft | 2.07 dB    |

The summary screen: all your test results at a glance.

OTDR - Cable12Fiber008.trc

Events 1550 nm (9 μm)

| Type | # | Loc. (km) | Loss (dB) | RefL. (dB) | Cumul. (dB) |
|------|---|-----------|-----------|------------|-------------|
| ↔    | 1 | 0.000     |           | -42.0      | 0.00        |
| ↘    | 2 | 5.113     | 0.10      |            | 1.12        |
| ↘    | 3 | 15.227    | 0.40      |            | 3.54        |
| ↘    | 4 | 27.238    | 0.30      |            | 6.24        |
| ↘    | 5 | 42.878    | 0.25      |            | 9.62        |
| ↘    | 6 | 48.599    | 0.15      |            | 10.91       |
| ↘    | 7 | 55.412    | 0.14      |            | 12.42       |
| ↘    | 8 | 63.417    | 0.14      |            | 14.16       |
| ↘    | 9 | 78.956    | --        |            | 17.28       |

Trace... Events

Event table: all events present on the link.



## Simple as 1-2-3

Step 2: Press FastTrace

Step 1: Connect the launch fiber

Step 3: Look at the result



# The Fiber Technician's Complete Test Set—Value-Added Options

## IP Testing

Performing complete access network testing also means testing the delivered service. With the AXS-100's IP testing option, you can perform basic IP verification that will facilitate future troubleshooting operations.

## Visual Fault Locator

Ideal for easily identifying macrobends, bad splices or bad connectors, this option delivers built-in 650 nm visual fault location on a universal connector.

## Power Meter GeX

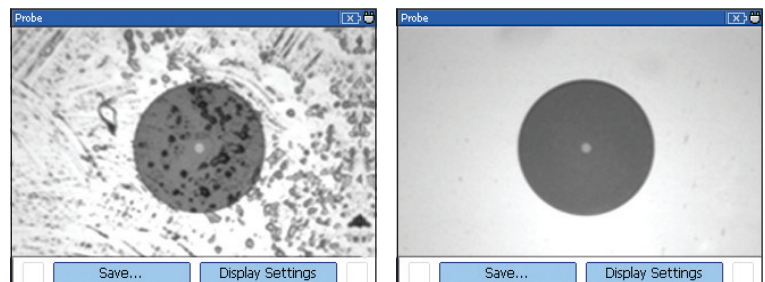
The AXS-100's optional power meter covers the 800 to 1650 nm range, offering a power range of -60 to 26 dBm (GeX 2 mm); it is also calibrated according to CWDM wavelengths. The optional power meter comes with a three-year recommended calibration interval, providing for a very low cost of ownership.

## SmartKit Software

Save time on the field with automated software analysis functions. Let the instrument work for you. This software package combines automatic macrobend detection, pass/fail and fault finding features. It enables you to access all your results at once and easily check link status. A single summary screen shows you detailed pass/fail status, fiber-length measurements and pinpoint macrobend localization.

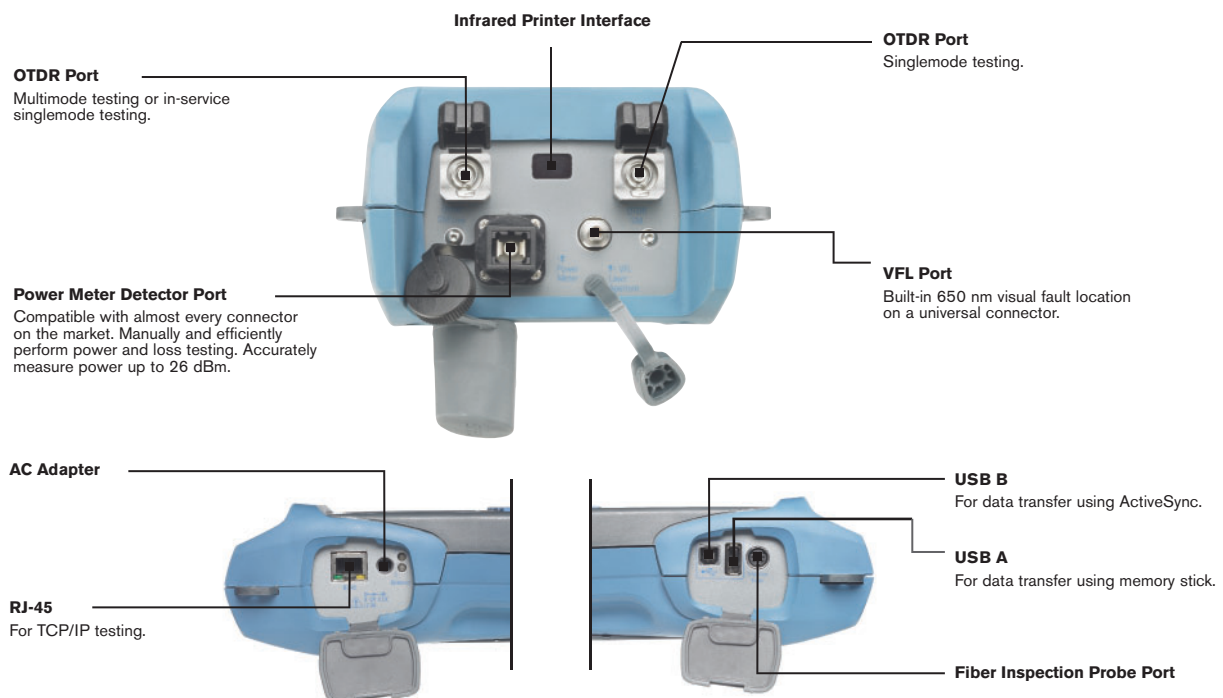
## Fiber Inspection Probe

In any optical network, connectors should be kept clean and in good condition—which is not always easy in outside conditions. You can quickly and easily inspect fiber ends or connectors using a fiber inspection probe, and view the endfaces on the AXS-100's high-resolution display. Then, save your image captures for future documentation purposes.



View fiber ends and connector endfaces on the AXS-100's high-resolution display.

## Flexible Connectivity



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

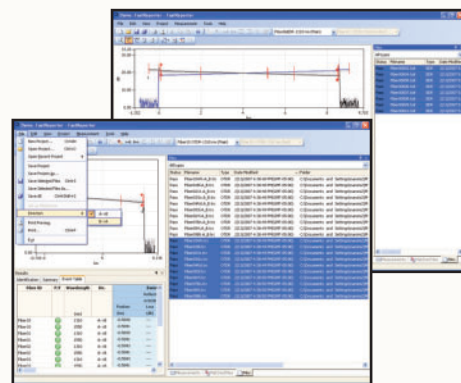
The optional FastReporter software package provides you with the post-processing tools and functionalities you need to meet such challenges, whatever the application. Designed for **off-line analysis of field-acquired data**, FastReporter offers a truly intuitive graphical user interface, which contributes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



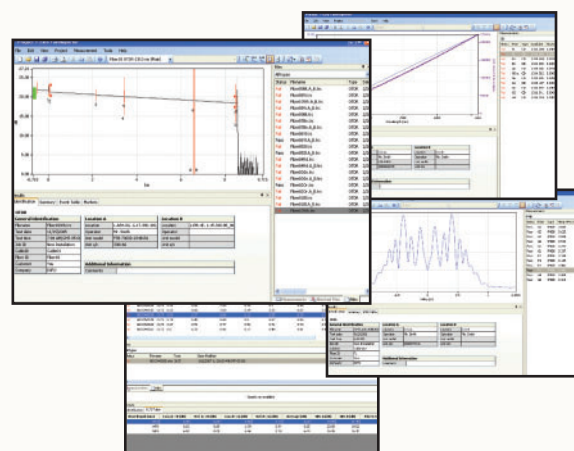
Bidirectional Batch Analysis

### 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.



## 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



## SPECIFICATIONS <sup>a</sup>

|                                               | AXS-100                                                                           | AXS-110                                                                                     |
|-----------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Wavelength (nm)                               | 1310/1550/1625                                                                    | 850/1300/1310/1550                                                                          |
| Dynamic range <sup>b</sup> (dB)               | 29/28/28 (1310/1550/1625)                                                         | 24/25/32/30 (850/1300/1310/1550)                                                            |
| Pulse width (ns)                              | 10, 30, 100, 275, 1000, 2500, 10 000                                              | Multimode: 5, 10, 30, 100, 275, 1000<br>Singlemode: 5, 10, 30, 100, 275, 1000, 2500, 10 000 |
| Event dead zone <sup>c</sup> (m)              | 2.5                                                                               | 0.8                                                                                         |
| Attenuation dead zone <sup>c</sup> (m)        | 11/12/12                                                                          | 3.5/4.5/4/4.5                                                                               |
| Launch conditions <sup>d</sup>                |                                                                                   | Class CPR 1 or 2                                                                            |
| Linearity (dB/dB)                             | ±0.05                                                                             | ±0.03                                                                                       |
| Loss threshold (dB)                           | 0.05                                                                              | 0.01                                                                                        |
| Loss resolution (dB)                          | 0.01                                                                              | 0.01                                                                                        |
| Sampling resolution (m)                       | 0.16 to 5                                                                         | Multimode: 0.08 to 2.5<br>Singlemode: 0.08 to 5.0                                           |
| Sampling points                               | Up to 30 000                                                                      | Up to 64 000                                                                                |
| Distance uncertainty <sup>e</sup> (m)         | ±(1 + 0.005 % x distance + sampling resolution)                                   | ±(0.75 + 0.0025 % x distance + sampling resolution)                                         |
| Distance range (km)                           | 0.65 to 160                                                                       | Multimode: 0.1 to 40<br>Singlemode: 0.65 to 260                                             |
| Typical real-time refresh (Hz)                | 2                                                                                 | 4                                                                                           |
| Memory capacity                               | 500 traces                                                                        | 500 traces                                                                                  |
| Measurement time                              | User-defined                                                                      | User-defined                                                                                |
| Stable source output power <sup>f</sup> (dBm) | -9                                                                                | Multimode: -1.5<br>Singlemode: -6.5                                                         |
| Visual fault locator (optional)               | Laser, 650 nm ± 10 nm<br>CW Typical P <sub>out</sub> in 62.5/125 µm: 3 dBm (2 mW) | Laser, 650 nm ± 10 nm<br>CW Typical P <sub>out</sub> in 62.5/125 µm: 3 dBm (2 mW)           |

## OPTIONAL POWER METER <sup>g</sup>

|                                             |                                                                                                                       |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Calibrated wavelengths (nm)                 | 850, 1270, 1290, 1310, 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610, 1625 |
| Power range (dBm)                           | 26 to -64 (GeX 2 mm)                                                                                                  |
| Uncertainty                                 | ±5 % ± 0.4 nW (up to 5 dBm)                                                                                           |
| Display resolution (dB)                     | 0.01 (-54 dBm to P <sub>max</sub> )<br>0.1 (-54 dBm to -64 dBm)<br>1 (-64 dBm to min)                                 |
| Automatic offset nulling range <sup>h</sup> | Maximum power to -38 dBm                                                                                              |
| Tone detection (Hz)                         | 270/1000/2000                                                                                                         |

## GENERAL SPECIFICATIONS

|                   |                                                                                           |
|-------------------|-------------------------------------------------------------------------------------------|
| Size (H x W x D)  | 250 mm x 125 mm x 75 mm (9 7/8 in x 4 15/16 in x 3 in)                                    |
| Weight            | 1 kg (2.2 lb)                                                                             |
| Temperature       | operating -18 °C to 50 °C (14 °F to 122 °F)<br>storage -40 °C to 70 °C (-40 °F to 158 °F) |
| Relative humidity | 0 % to 95 % non-condensing                                                                |
| Power             | Li-Ion batteries 8 hours of continuous operation as per Bellcore TR-NWT-001138            |
| Warranty (years)  | 1                                                                                         |

### Notes

- a. All specifications valid at 23 °C ± 2 °C (73.4 °F ± 3.6 °F) with an FC/PC connector, unless otherwise specified.
- b. 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.
- c. Typical dead zone for multimode reflectance below -35 dB and singlemode reflectance below -45 dB, using shortest pulse.
- d. For multimode port, controlled launch conditions allow 50 µm and 62.5 µm multimode fiber testing.
- e. Does not include uncertainty due to fiber index.
- f. Typical output power is given at 1300 nm for multimode output and 1550 nm for singlemode output.
- g. At 23 °C ± 1 °C, 1550 nm and with FC connector. With OTDR in idle mode, battery operated.
- h. For ±0.05 dB, from 18 °C to 28 °C.

## LASER SAFETY



21 CFR 1040.10 AND IEC 60825-1:2007  
CLASS 1M WITHOUT VFL OPTION  
CLASS 3R WITH VFL OPTION

## ORDERING INFORMATION

### AXS-100-XX-XX-XX-XX-XX-XX-XX-XX

#### Model ■

AXS-100-003B = Access OTDR 1550 nm  
AXS-100-023B = Access OTDR 1310/1550 nm  
AXS-100-034B = Access OTDR 1550/1625 nm  
AXS-100-000 = None <sup>a</sup>

#### 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

#### Second port ■

00 = None  
04B = Filtered 1625 nm <sup>b</sup>

#### Second 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

#### Software summary kit

SK1 = SmartKit including macrobending detection, pass/fail and fault finder  
SK2 = IP testing  
SK3 = Fiber inspection probe software <sup>c</sup>

#### Probe option

00 = Without probe  
FP4S = Inspection probe (400x)  
FP4D = Inspection probe (200x/400x)

#### VFL

00 = Without visual fault locator  
VFL = With visual fault locator

#### Connector adapter

FOA-12 = Biconic  
FOA-14 = D4, D4/PC  
FOA-16 = SMA/906  
FOA-22 = FC, FC (PC/SPC/UPC/APC), NEC-D3  
FOA-28 = DIN 47256 (LSA): DIN 47256 (PC/APC)  
FOA-32 = ST, ST (PC/SPC/UPC)  
FOA-40 = Diamond HMS-0, HFS-3 (3.5 mm)  
FOA-54 = SC (PC/SPC/UPC/APC)  
FOA-76 = FSMA HMS-10/AG, HFS-10/AG  
FOA-78 = Radiall EC  
FOA-84 = Diamond HMS-10, HFS-13  
FOA-96B = E-2000/APC  
FOA-98 = LC  
FOA-99 = MU

#### Power meter

00 = Without power meter  
PM2X = With GeX power meter

Example: AXS-100-023B-EI-EUI-89-04B-EA-EUI-91-PM2X-FOA-22-VFL-FP4S-SK1-SK2-SK3

### AXS-110-XX-XX-XX-XX-XX-XX-XX

#### Model ■

AXS-110-23B = Dual-wavelength SM OTDR 1310/1550 nm (9/125 μm)  
AXS-110-12CD = Dual-wavelength MM OTDR 850/1300 nm (50/125 μm, 62.5/125 μm)  
AXS-110-12CD-23B = Four-wavelength MM/SM all-fiber OTDR 850/1300 nm (50/125 μm, 62.5/125 μm) and 1310/1550 nm (9/125 μm)

#### Connector ■

EA-EUI-28 <sup>b</sup> = APC/DIN 47256  
EA-EUI-89 <sup>b</sup> = APC/FC, narrow key  
EA-EUI-91 <sup>b</sup> = APC/SC  
EA-EUI-95 <sup>b</sup> = 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

#### Power meter ■

00 = Without power meter  
PM2X = With GeX power meter

#### Notes

- Please refer to the example above. First select the singlemode connector, and then the multimode connector.
- Singlemode only.
- Mandatory with FP1 or FP5.

#### Software summary kit

SK1 = SmartKit including macrobending detection, pass/fail and fault finder  
SK2 = IP testing  
SK3 = Fiber inspection probe software <sup>c</sup>

#### Probe option

00 = Without probe  
FP4S = Inspection probe (400x)  
FP4D = Inspection probe (200x/400x)

#### VFL

00 = Without visual fault locator  
VFL = With visual fault locator

#### Connector adapter

FOA-12 = Biconic  
FOA-14 = D4, D4/PC  
FOA-16 = SMA/906  
FOA-22 = FC, FC (PC/SPC/UPC/APC), NEC-D3  
FOA-28 = DIN 47256 (LSA): DIN 47256 (PC/APC)  
FOA-32 = ST, ST (PC/SPC/UPC)  
FOA-40 = Diamond HMS-0, HFS-3 (3.5 mm)  
FOA-54 = SC (PC/SPC/UPC/APC)  
FOA-76 = FSMA HMS-10/AG, HFS-10/AG  
FOA-78 = Radiall EC  
FOA-84 = Diamond HMS-10, HFS-13  
FOA-96B = E-2000/APC  
FOA-98 = LC  
FOA-99 = MU

Example: AXS-110-12CD-23B-EA-EUI-89-EI-EUI-95-PM2X-FOA-22-VFL-FP4S-SK1-SK2-SK3

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|                        |                                                                                           |                                            |                          |                         |
|------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|-------------------------|
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| EXFO Europe            | Omega Enterprise Park, Electron Way                                                       | Chandlers Ford, Hampshire S053 4SE ENGLAND | Tel.: +44 2380 246810    | Fax: +44 2380 246801    |
| EXFO Service Assurance | 285 Mill Road                                                                             | Chelmsford, MA 01824 USA                   | Tel.: +1 978 367-5600    | Fax: +1 978 367-5700    |

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>

In case of discrepancy, the Web version takes precedence over any printed literature.