

# AXS-100

NETWORK TESTING - OPTICAL



Compact, lightweight handheld OTDR optimized for access/FTTx network testing

- **Top user-friendliness:** one-button testing, combined with EXFO's proprietary FTTx software package (macro bend/fault finder, pass/fail indicators)
- **Multiple options,** including power meter, visual fault locator (VFL), fiber inspection probe, printer and IP testing
- **Fault Finder mode,** for quick identification/location of a fiber break
- **Complete connectivity flexibility:** USB stick compatibility and USB cable data download via ActiveSync\*
- **Advanced TFT transfective color display,** for assured legibility under direct sunlight or in other demanding outside conditions
- **Handheld,** small, lightweight unit: 1 kg (2.2 lb)
- **Built-in ruggedness** for outside-plant usage
- **Troubleshooting option,** enabling in-service, out-of-band network testing

\* Microsoft ActiveSync™



# ||| The Definitive Handheld OTDR for FTTx Testing

EXFO's AXS-100 Access OTDR combines the industry's leading OTDR technology with power meter functionalities in one powerful handheld unit. Optimized for testing passive optical networks (PON) within FTTx architectures, it offers several wavelength configurations and a wide range of options, for first-class flexibility. Use it at the optical network terminal (ONT), drop terminal or fiber distribution hub (FDH) for FTTH distribution (F2) fiber characterization, troubleshooting and fault locating.

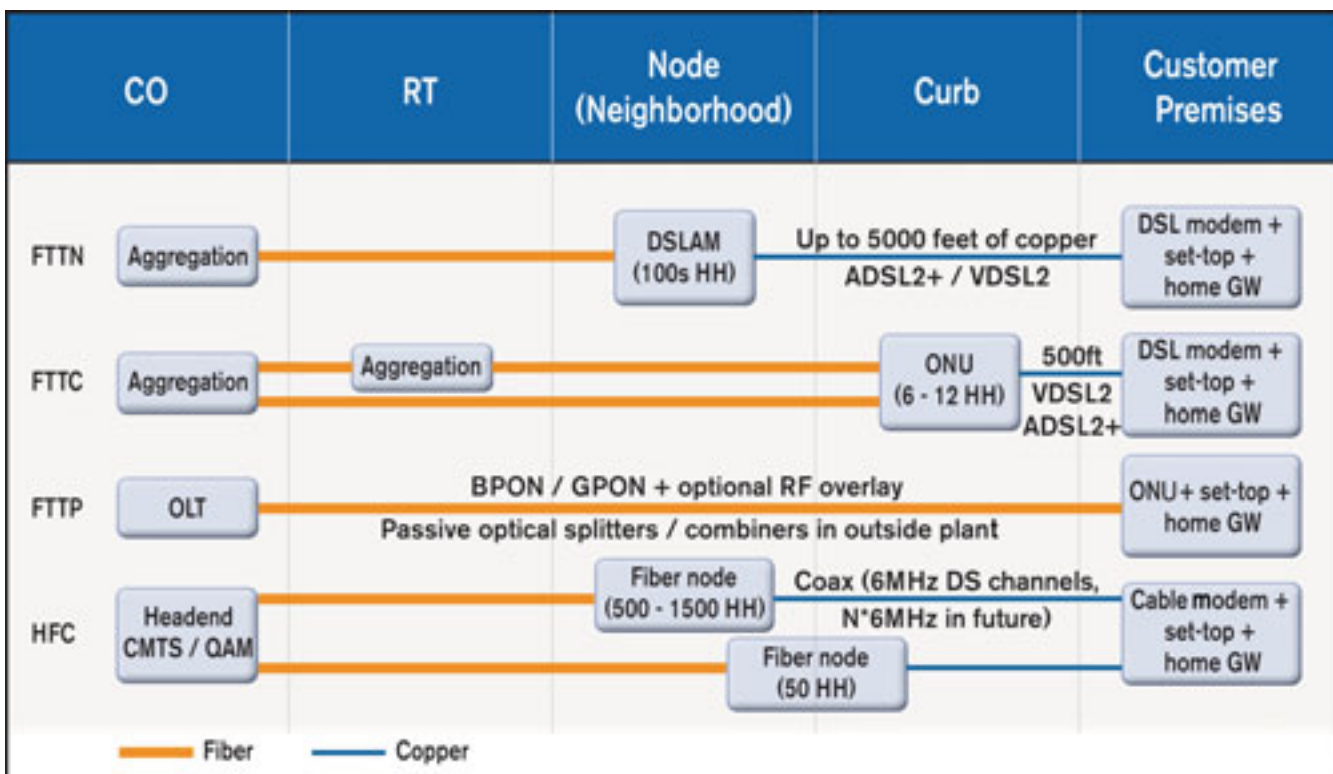
## Access Networks—Bringing New Testing Requirements

FTTx networks are becoming a worldwide solution for offering high-speed triple-play services, as carriers must ensure the same level of reliability and availability as that of traditional twisted-pair copper-based access networks.

Increased fiber deployment within access networks brings new requirements and the need for highly efficient testing strategies. As most of the work is performed in ever-changing outside conditions (cold/warm/hot, day/night, etc.), working space is often limited and access technicians are getting acquainted with the latest FTTx technologies, choosing a simple, reliable testing tool is key.



## High-Speed Access Technologies



# Reliable and Simple FTTx Testing—EXFO's Proprietary FTTx Functionalities and Software Package

The AXS-100 Access OTDR makes testing an FTTx network an easy task. Simply connect the fiber, press FasTrace, and view the result. This handheld unit provides unparalleled ease of use, even for technicians with little background in optical/OTDR testing. Its proprietary FTTx software package enables you to view all results at once and easily assess link status. Without further analysis, you can view fiber length data and detailed pass/fail status, and even verify the presence of macrobendings.



**Step 1:** Connect the launch fiber

**Step 2:** Press FastTrace



**Step 3:** Look at the result

Pass/fail status      Fault finder (distance)

Macrobend detector

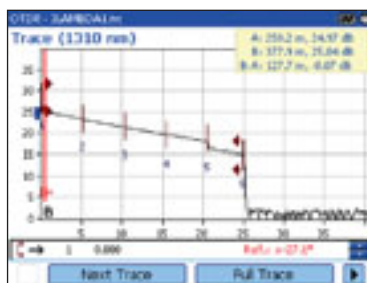
| Wavelength | Status | Span Loss | Span ORL |
|------------|--------|-----------|----------|
| 1310nm     | FAIL   | 19.03 dB  | 48.02    |
| 1550nm     | FAIL   | 16.74 dB  | 48.05    |

Span Length: 157.257 kft

| Macrobend | Location    | Delta Loss |
|-----------|-------------|------------|
| 1         | 82.880 kft  | 0.63 dB    |
| 2         | 129.022 kft | 1.34 dB    |
| 3         | 142.561 kft | 2.07 dB    |

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

With its Auto, Manual, Fault Finder and real time modes, the AXS-100 is really the FTTx test instrument of choice.



| Type | # | Loc. (m) | Loss (dB) | RefL (dB) | Cumul. (dB) |
|------|---|----------|-----------|-----------|-------------|
| →    | 1 | 0.000    |           | > -27.1*  | 0.000       |
| ↘    | 2 | 5.163    | 0.209     |           | 1.800       |
| ↘    | 3 | 10.392   | 0.052     |           | 3.636       |
| ↘    | 4 | 15.58*   | -0.069    |           | 5.321       |
| ↘    | 5 | 20.523   | 1.494*    | -48.0     | 8.454       |
| ↘    | 6 | 24.991   | --        | -34.9*    | 10.026      |

The more experienced user can also use the AXS-100's OTDR trace and event features.

# Flexible Configurations and Options

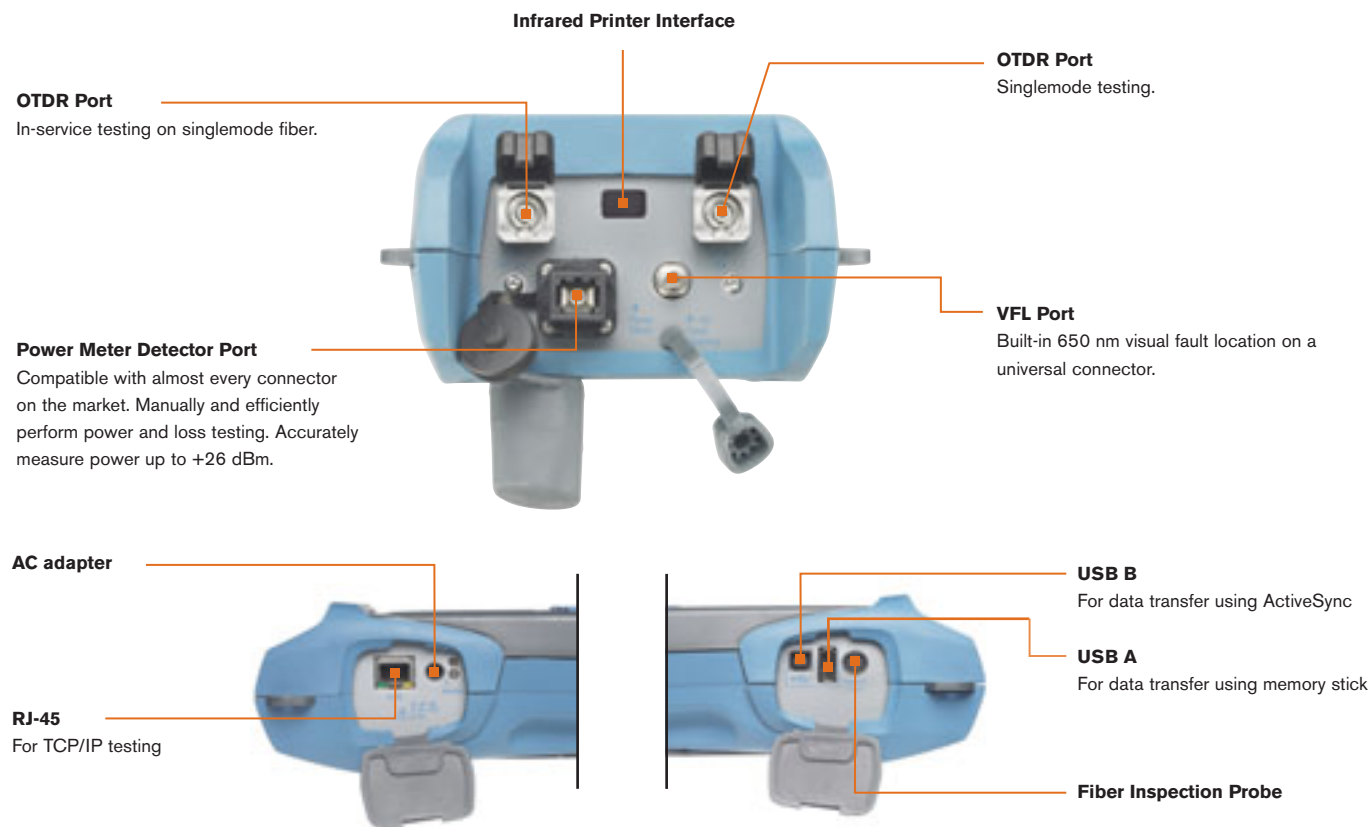
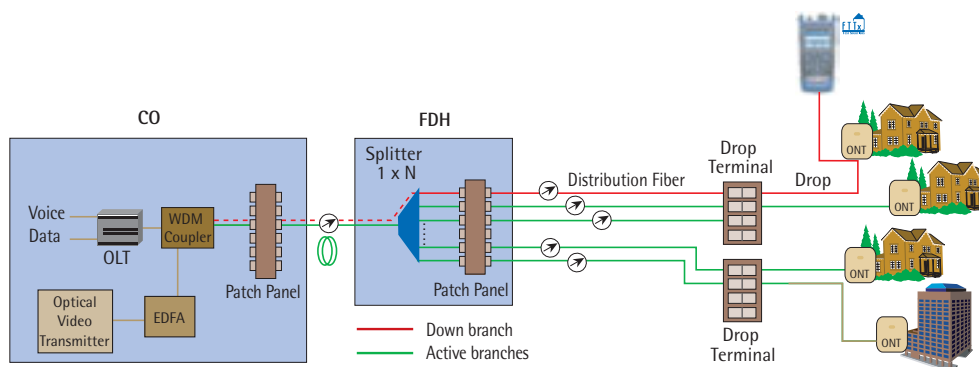
## Multiple Wavelengths, Large Storage Capacity

Choose the OTDR model that meets your wavelength requirements: 1550 nm, 1310/1550 nm, 1550/1625 nm and filtered 1625 nm, for in-service FTTH troubleshooting. What's more, the AXS-100 lets you save up to 500 traces.

## 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.

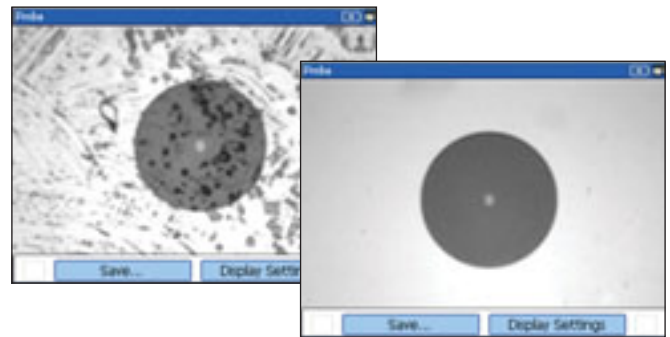
In-service OTDR troubleshooting of optical fiber does not interfere with the normal operation and expected performance of the information channels. EXFO's AXS-100 does not interfere with the CO's laser transmitters, as it uses an out-of-band wavelength, as per the ITU-T L.41 (Maintenance Wavelength on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



<sup>1</sup> Additional filtering may be required at the transmission equipment.

## Fiber Inspection Probe Option

In any optical network, connectors should be kept clean and in good condition—which is not always easy in outside conditions. Using a fiber inspection probe (enabling quick, easy inspection of fiber ends or connectors using the AXS-100's high-resolution display) is the best way to perform this critical connector check.



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

## Flexible Configurations and Options (Cont'd)

### IP Testing Option

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 macrobend, bad splices or bad connectors. Built-in 650 nm visual fault location on a universal connector.

### Power Meter GeX Option

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 comes with a three-year recommended calibration interval, providing for a very low cost of ownership.

### USB Interfaces

Easily transfer your OTDR data files thanks to the AXS-100's two USB ports:

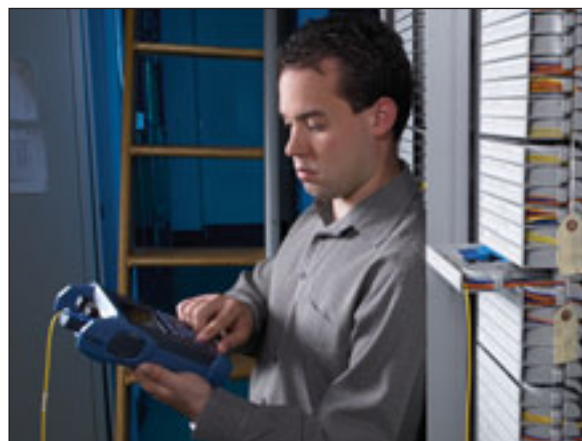
- Main USB port used to interface with a USB stick
- Secondary USB port allowing direct cable download to your PC using ActiceSync

### Infrared Interface

Achieve fast, on-the-spot OTDR trace printing by using this standard infrared interface to send your file to any portable printer equipped with an infrared interface.

### Fault Finder Option

When working in a central office (CO), it is critical to choose a device that will easily and quickly locate a fault, a simple tool that requires as little manipulation as possible, such as the AXS-100 Access OTDR. Equipped with the Fault Finder mode option, the AXS-100 automatically sets itself up for optimal, quick and reliable detection of the distance to the end of the fiber.



### SPECIFICATIONS <sup>a</sup>

|   |  |
|---|--|
| Dynamic range <sup>b</sup> (dB), (1310/1550/1625)     | 29/28/28   |
| Pulse width (ns)                                      | 10, 30, 100, 275, 1000, 2500, 10 000   |
| Event dead zone <sup>c</sup> (-45 dB), typ. (m)       | 2.5  |
| Attenuation dead zone <sup>c</sup> (-45 dB), typ. (m) | 11/12/12   |
| Linearity (dB/dB)                                     | ± 0.05   |
| Loss threshold (dB)                                   | ± 0.05   |
| Loss resolution (dB)                                  | 0.01   |
| Sampling resolution (m)                               | 0.16 to 5  |
| Sampling points                                       | Up to 30 000   |
| Distance uncertainty <sup>d</sup> (m)                 | ± (1 + 0.005 % x distance + sampling resolution)                                     |
| Distance range (km)                                   | 0.65 to 160  |
| Typical real-time refresh (s)                         | 0.5  |
| Memory capacity                                       | 500 traces   |
| Measurement time                                      | User-defined   |
| Stable source output power <sup>g</sup> (dBm)         | -9   |
| Visual fault locator (optional)                       | Laser, 650 nm ± 10 nm<br>CW<br>Typical P <sub>out</sub> in 62.5/125 µm: 3 dBm (2 mW) |

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

|   |   |
|---|---|
| Calibrated wavelengths (nm)                 | 850, 1300, 1310, 1490, 1550, 1625, 1650   |
| 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>f</sup> | Maximum power to -39 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 | -10 °C to 50 °C (14 °F to 122 °F)  |
| 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

- All specifications valid at 23 °C ± 2 °C (73.4 °F ± 3.6 °F) with an FC/PC connector, unless otherwise specified.
- Typical dynamic range with 10 µs pulse and three-minute averaging at SNR = 1.
- Typical dead zone for singlemode reflectance below -45 dB, using a 10 ns pulse.
- Does not include uncertainty due to fiber index.
- At 23 °C ± 1 °C, 1550 nm and with FC connector. With OTDR in idle mode, battery operated.
- For ±0.05 dB, from 18 °C to 28 °C
- Typical output power value at 1550 nm. For AXS-100-023B-04B typical value is -6 dBm.

### 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

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

**Model**

- AXS-100-003B = Access OTDR 1550 nm, 28 dB
- AXS-100-023B = Access OTDR 1310/1550 nm, 29/28 dB
- AXS-100-034B = Access OTDR 1550/1625 nm, 28/28 dB
- 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

**Note**

- a. Available with second port only.
- b. Not available with 1550/1625 nm.
- c. A set of software options is also available.
- d. Mandatory with FP1 or FP5.

**Software summary kit <sup>c</sup>**

- SK1 = Smart Kit including macrobending detection, pass/fail and fault finder
- SK2 = IP testing
- SK3 = Fiber Inspection Probe software <sup>d</sup>

**Probe**

- FP = Probe option
- FP1 = Probe connector cable and 200X probe
- FP5 = Probe connector cable and 200X/400X probe

**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 power meter Gex

Example: AXS-100-023B-EI-EUI-89-04B-EA-EUI-91-PM2X-FOA-22-VFL-FP1-SK1-SK2-SK3

**Rugged Handheld Solutions**

|                 |                                      |
|-----------------|--------------------------------------|
| <b>OPTICAL</b>  | <b>COPPER ACCESS</b>                 |
| - OLSs          | - ADSL/ADSL2+, SHDSL, VDSL test sets |
| - Power meters  | - VoIP and IPTV test sets            |
| - Light sources | - Ethernet test sets                 |
| - Talk sets     | - POTS test sets                     |

**Platform-Based Solutions**

|                        |                                 |                                       |
|------------------------|---------------------------------|---------------------------------------|
| <b>OPTICAL FIBER</b>   | <b>DWDM TEST SYSTEMS</b>        | <b>TRANSPORT AND DATACOM</b>          |
| - OTDRs                | - OSAs                          | - SONET/DSn (DS0 to OC-192) testers   |
| - OLSs                 | - PMD analyzers                 | - SDH/POH (64 kb/s to STM-64) testers |
| - ORL meters           | - Chromatic dispersion analyzer | - T1/T3 testers                       |
| - Variable attenuators |                                 | - ET testers                          |
|                        |                                 | - 10/100 and Gigabit Ethernet testers |
|                        |                                 | - Fibre Channel testers               |
|                        |                                 | - 10 Gigabit Ethernet testers         |



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Toll-free: 1 800 663-3936 (USA and Canada) | www.EXFO.com

|                      |  |  |                           |                          |
|----------------------|--|--|---------------------------|--------------------------|
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| <b>EXFO Toronto</b>  | 160 Drumlin Circle                                     | Concord (Ontario) L4K 3E5 CANADA           | Tel.: 1 905 738-3741      | Fax: 1 905 738-3712      |
| <b>EXFO America</b>  | 3701 Plano Parkway, Suite 160                          | Plano, TX 75075 USA                        | Tel.: 1 800 663-3936      | Fax: 1 972 836-0164      |
| <b>EXFO Europe</b>   | PARIS > Le Dynasteur, 10/12 rue Andras Beck            | 92366 Meudon la Forêt Cedex FRANCE         | Tel.: +33.1.40.83.85.85   | Fax: +33.1.40.83.04.42   |
|                      | SOUTHAMPTON > Omega Enterprise Park, Electron Way      | Chandlers Ford, Hampshire S053 4SE ENGLAND | Tel.: +44 2380 246810     | Fax: +44 2380 246801     |
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| <b>EXFO China</b>    | No.88 Fuhua, First Road                                | Shenzhen 518048, CHINA                     | Tel.: +86 (755) 8203 2300 | Fax: +86 (755) 8203 2306 |
|                      | Central Tower, Room 801, Futian District               |  |                           |                          |
|                      | Beijing New Century Hotel Office Tower, Room 1754-1755 | Beijing 100044 P.R. CHINA                  | Tel.: +86 (10) 6849 2738  | Fax: +86 (10) 6849 2662  |
|                      | No. 6 Southern Capital Gym Road                        |  |                           |                          |

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. 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). 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. Contact EXFO for prices and availability or to obtain the phone number of your local EXFO distributor.

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