Performance assurance for Ethernet-based services
- Complete EtherSAM™ (ITU-T Y.156sam) test suite. EtherSAM is the new standard for testing Ethernet mobile backhaul and commercial services
- LAN and WAN PHY capability in a single module
- Fully integrated functionality for assessing the performance of Ethernet transport networks
- Packet jitter measurement to qualify Ethernet transport networks for transmission of delay-sensitive traffic such as video and voice-over-IP (VoIP)
- Throughput, back-to-back, latency and frame loss measurements as per RFC 2544 (bidirectional)
- Multistream generation and analysis, allowing quality of service (QoS) verification through VLAN and ToS/DSCP prioritization testing
- Up to 10 Gbit/s full-line-rate data capture and decode
- MPLS, MPLS-TP, PBB-TE and IPv4/IPv6 support for complete Carrier Ethernet validation

Platform Compatibility
- FTB-500 Platform
- FTB-200 Compact Platform
EXFO’s FTB-8510G Packet Blazer™ offers performance assurance for 10 Gigabit Ethernet-based services. Its suite of test applications provides all the measurements required for validating service-level agreements (SLAs) between service providers and their customers. Housed in the FTB-500 Platform or FTB-200 Compact Platform, the FTB-8510G module tests connectivity in its native format: 10GBASE-xR or 10GBASE-xW used for transport of Ethernet-based LAN-to-LAN services. It can also be used to test next-generation SONET/SDH, hybrid multiplexers, dark fiber or xWDM networks running 10 Gigabit Ethernet interfaces.

Combined with its rack-mounted manufacturing/R&D-environment counterpart, the IQS-8510G Packet Blazer, the FTB-8510G simplifies and speeds up the deployment of Ethernet services.

**Key Features**

- Complete EtherSAM™ (ITU-T Y.156sam) test suite allowing full validation of today’s Ethernet services (bidirectional results through dual test set)*
- Measures throughput, back-to-back, latency and frame loss as per RFC 2544 (bidirectional results through dual test set)
- Multistream generation and analysis, providing per-stream measurements for throughput, latency, frame loss and packet jitter
- LAN PHY and WAN PHY available in a single module
- Simultaneous traffic generation and reception at 100 % wire speed for 10GBASE-SR, -ER, -LR, -SW, -EW or -LW full-duplex interfaces at all valid frame sizes
- Transmits and analyzes up to ten streams, perfect for installing, commissioning and maintaining Ethernet networks
- UDP, TCP and IP header integrity validation
- Easy-to-use smart user interface (SUI) for configurable screens, customization of test suites, as well as real-time and historical performance reporting
- Capability to remote control the Packet Blazer test module with the Visual Guardian Lite software or VNC
- Configurable advanced filters for in-depth network troubleshooting
- PBB-TE and MPLS support for Carrier Ethernet
- Up to 10 Gbit/s full-line-rate data capture and decode
- Smart Loopback
- Service disruption time measurement
- Internet protocol version 6 (IPv6 testing)

* Patent pending
EtherSAM: The New Standard in Ethernet Testing

ITU-T Y.156sam is the newly introduced draft standard for turning-up and troubleshooting Carrier Ethernet services. This new methodology is completely adapted to today’s Ethernet services especially mobile backhaul and commercial services. Up to now, RFC 2544 has been the most widely used methodology. However, it was designed for network device testing in the lab, not for services testing in the field. Y.156sam is the first testing standard developed for the field. It has a number of advantages over the RFC 2544 including validation of critical SLA criteria such as packet jitter and QoS measurements. This methodology is also significantly faster, therefore saving time and resources while optimizing QoS.

Contrary to other methodologies, EtherSAM supports new multiservice offerings. It can simulate all types of services that will run on the network and simultaneously qualify all key SLA parameters for each of these services. Moreover, it validates the QoS mechanisms provisioned in the network to prioritize the different service types, resulting in more accurate validation and much faster deployment and troubleshooting. EtherSAM is comprised of two phases, the Network Configuration Test and the Service Test.

Network Configuration Test
The Network Configuration Test consists in sequentially testing each service. It validates that the service is properly provisioned and that all specific KPIs or SLA parameters are met.

Service Test
Once the configuration of each individual service is validated, the Service Test simultaneously validates the quality of all the services over time.

EtherSAM Bidirectional Results
EXFO’s EtherSAM approach proves even more powerful as it executes the complete ITU-T Y.156sam test with bidirectional measurements. Key SLA parameters are measured independently in each test direction, thus providing 100 % first-time-right service activation—that is the highest level of confidence in service testing.
RFC 2544 Test Suite

The FTB-8510G Packet Blazer can perform the RFC 2544 test suite for 10 GbE LAN/WAN interface at all frame sizes and at full line rate, allowing the provider to certify that the circuit is efficient and error-free at 100% utilization.

The Packet Blazer supports automated RFC 2544 testing, including throughput, latency, burst (back-to-back) and frame loss. Automation also provides ease of use for field technicians by enabling accurate, efficient measurements and results through a clear and simple pass/fail indication. In addition, the Packet Blazer generates reports that can be given to customers for future reference related to their specific SLAs.

Efficient Testing Leads to Reliable Performance

MPLS, MPLS-TP and PBB-TE: Carrier Ethernet Transport Solution Testing

As technologically-sophisticated business and residential consumers continue to drive demand for premium, high-bandwidth data services such as voice and video, service providers worldwide are evolving their transport infrastructures to support these bandwidth and quality intensive services. No longer is an all-IP core sufficient; providers must now expand their IP convergence to the edge/metro network, in a cost-effective, quality-assured manner. Ethernet has long been accepted as an inexpensive, scalable data networking solution in LAN environments. The stringent QoS expectations require solutions that tap into the cost-effectiveness of Ethernet without sacrificing the benefits of connection-oriented (albeit it costly) TDM solutions such as SONET/SDH.

Ethernet tunneling technologies such as Provider Backbone Bridge-Traffic Engineering or PBB-TE (also referred to as PBT) and transport MPLS address these requirements. These technologies enable connection-oriented Ethernet, providing carriers with a means of offering scalable, reliable and resilient Ethernet services. The PBB-TE and MPLS options on the FTB-8510G Packet Blazer offer service providers a comprehensive field tool to efficiently qualify Ethernet services from end to end, validating metro and core tunneling technologies.
EtherBERT™
Ethernet is increasingly carried across a variety of layer 1 media over longer distances. This creates a growing need for the certification of Ethernet transport on a bit-per-bit basis, which can be done using bit-error-rate testing (BERT).

BERT uses a pseudo-random binary sequence (PRBS) encapsulated into an Ethernet frame, making it possible to go from a frame-based error measurement to a bit-error-rate measurement. This provides the bit-per-bit error count accuracy required for acceptance testing of physical-medium transport systems. BERT-over-Ethernet should usually be used when Ethernet is carried transparently over layer 1 media, in cases such as Ethernet over DWDM, CWDM or dark fiber.

Ethernet QoS Measurements
Data services are making a significant shift toward supporting a variety of applications on the same network. Multiservice offerings such as triple-play services have fuelled the need for QoS testing to ensure the condition and reliability of each service and fully qualify SLA parameters. The FTB-8510G Packet Blazer allows service providers to simultaneously simulate and qualify different applications through its multistream application. The user has the capability to configure up to ten streams with different Ethernet and IP QoS parameters such as VLAN ID (802.1Q), VLAN Priority (802.1p), VLAN stacking (802.1ad Q-in-Q), ToS and DSCP. Specific stream profiles to transmit VoIP, video and data can be selected for each stream. Throughput, latency, frame loss and packet jitter (RFC 3393) measurements are also available simultaneously for each stream, allowing fast and in-depth qualification of all SLA criteria.

Ethernet Advanced Troubleshooting
The FTB-8510G provides a number of advanced features essential for in-depth troubleshooting in the event of network failures or impairments. The advanced filtering option allows the user to configure up to ten filters with each up to four operands, which will be applied to the received Ethernet traffic. Detailed statistics are available for each configured filter providing the user with critical information required to pinpoint specific problems. Additionally, the FTB-8510G supports a traffic scan feature that allows quick identification and monitoring of VLAN and MPLS flows on the network. This can help clearly identify top bandwidth users.

The FTB-8510G also supports full-line-rate data capture and decode. This key troubleshooting tool enables field technicians to easily identify complex network issues. The comprehensive capture feature includes the capability to configure capture filters and triggers to quickly zero-in on network events.
**Functional Specifications**

### OPTICAL INTERFACES

<table>
<thead>
<tr>
<th>Wavelength</th>
<th>10GBASE-SW</th>
<th>10GBASE-SR</th>
<th>10GBASE-LW</th>
<th>10GBASE-LR</th>
<th>10GBASE-EW</th>
<th>10GBASE-ER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tx level (802.3ae-compliant)</td>
<td>–7.3 to –1 dBm</td>
<td>–7.3 to –1 dBm</td>
<td>–8.2 to 0.5 dBm</td>
<td>–8.2 to 0.5 dBm</td>
<td>–4.7 to 4.0 dBm</td>
<td>–4.7 to 4.0 dBm</td>
</tr>
<tr>
<td>Rx operating range</td>
<td>–9.9 to –1.0 dBm</td>
<td>–9.9 to –1.0 dBm</td>
<td>–14.4 to 0.5 dBm</td>
<td>–14.4 to 0.5 dBm</td>
<td>–15.8 to –1.0 dBm</td>
<td>–15.8 to –1.0 dBm</td>
</tr>
<tr>
<td>Tx operational wavelength range (802.3ae-compliant)</td>
<td>840 nm to 860 nm</td>
<td>1260 nm to 1355 nm</td>
<td>1260 nm to 1355 nm</td>
<td>1530 nm to 1565 nm</td>
<td>1530 nm to 1565 nm</td>
<td></td>
</tr>
<tr>
<td>Measurement accuracy (uncertainty)</td>
<td>±4.6 ppm</td>
<td>±4.6 ppm</td>
<td>±4.6 ppm</td>
<td>±4.6 ppm</td>
<td>±4.6 ppm</td>
<td>±4.6 ppm</td>
</tr>
<tr>
<td>Maximum Rx before damage</td>
<td>0 dBm</td>
<td>0 dBm</td>
<td>1.5 dBm</td>
<td>1.5 dBm</td>
<td>4.0 dBm</td>
<td>4.0 dBm</td>
</tr>
<tr>
<td>Jitter compliance</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
</tr>
<tr>
<td>Ethernet classification</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
<td>IEEE 802.3ae</td>
</tr>
<tr>
<td>Laser type</td>
<td>VCSEL</td>
<td>VCSEL</td>
<td>DFB</td>
<td>DFB</td>
<td>EML</td>
<td>EML</td>
</tr>
<tr>
<td>Eye safety</td>
<td>Class 1 laser; complies with 21 CFR 1040.10 and IEC 60825-1</td>
<td>Class 1 laser; complies with 21 CFR 1040.10 and IEC 60825-1</td>
<td>Class 1 laser; complies with 21 CFR 1040.10 and IEC 60825-1</td>
<td>Class 1 laser; complies with 21 CFR 1040.10 and IEC 60825-1</td>
<td>Class 1M laser; complies with 21 CFR 1040.10 and IEC 60825-1</td>
<td>Class 1M laser; complies with 21 CFR 1040.10 and IEC 60825-1</td>
</tr>
<tr>
<td>Connector</td>
<td>Duplex LC</td>
<td>Duplex LC</td>
<td>Duplex LC</td>
<td>Duplex LC</td>
<td>Duplex LC</td>
<td>Duplex LC</td>
</tr>
<tr>
<td>Transceiver type (compliant with XFP MSA)</td>
<td>XFP</td>
<td>XFP</td>
<td>XFP</td>
<td>XFP</td>
<td>XFP</td>
<td>XFP</td>
</tr>
</tbody>
</table>

* When clocking is in internal mode

### SYNCHRONIZATION INTERFACES

#### DS1/E1 external input clock interface

<table>
<thead>
<tr>
<th>Parameter</th>
<th>DS1</th>
<th>E1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rx level sensitivity (short haul only)</td>
<td>For 772 kHz: TERM: 6 dB (cable loss only)</td>
<td>For 1024 kHz: TERM: 6 dB (cable loss only)</td>
</tr>
<tr>
<td>Reception bit rate</td>
<td>1.544 Mbit/s ± 50 ppm</td>
<td>2.048 Mbit/s ± 50 ppm</td>
</tr>
<tr>
<td>Input jitter tolerance</td>
<td>AT&amp;T PUB 62411, GR-499 section 7.3</td>
<td>G.823 section 7.2</td>
</tr>
<tr>
<td>Line coding</td>
<td>AMI and B8ZS</td>
<td>HD83 and AMI</td>
</tr>
<tr>
<td>Input impedance (resistance termination)</td>
<td>100 ohms ± 5 %, balanced</td>
<td>120 ohms ± 5 %, balanced</td>
</tr>
<tr>
<td>Connector type</td>
<td>BANTAM</td>
<td>BANTAM</td>
</tr>
</tbody>
</table>

#### Clock out interface

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tx pulse amplitude</td>
<td>600 mVpp ± 130 mV</td>
</tr>
<tr>
<td>Transmission frequency</td>
<td></td>
</tr>
<tr>
<td>Clock divider = 16</td>
<td>644.53 MHz</td>
</tr>
<tr>
<td>Clock divider = 32</td>
<td>322.266 MHz</td>
</tr>
<tr>
<td>Clock divider = 64</td>
<td>181.133 MHz</td>
</tr>
<tr>
<td>Output configuration</td>
<td>AC coupled</td>
</tr>
<tr>
<td>Load impedance</td>
<td>50 ohms</td>
</tr>
<tr>
<td>Maximum cable length</td>
<td>3 meters</td>
</tr>
<tr>
<td>Connector type</td>
<td>SMA</td>
</tr>
</tbody>
</table>
FTB-8510G Packet Blazer
10 Gigabit Ethernet Test Module

**Functional Specifications (Cont’d)**

### OPTICAL INTERFACES

**Optical interfaces**
- 10 GbE LAN and 10 GbE WAN
- Available wavelengths: 1550, 1310 and 1550 nm

### ELECTRICAL INTERFACES

**Electrical interfaces**
- External clock DS1/E1 and clock output
  - Line coding: B8ZS, AMI and BRZS
  - Termination mode: DS1/E1: Term
  - Framing: DS1: SF and ESF
  - Clocking: Internal, external (BITS) and recovered

**Clock output**
- Clock output: 10/100/1000BASE-T, GE and 4G

**Testing**
- EtherSAM (Y.1561/sam) Capability to perform the Network Configuration Test and Service Test as per ITUT Y.1561/sam. Tests can be performed to a loopback or dual test set mode for bidirectional results.

**RF-2544**
- Throughput, back-to-back, frame loss and latency measurements according to RFC 2544. Frame size: RFC-defined sizes, user-configurable (bidirectional).

**BERT**
- Utilized layer 1 up to layer 4 with or without VLAN tagging/untagging.
- Patterns (BERT)
  - PRBS 2E-1, PRBS 2E11-1, PRBS 2E23-1, PRBS 2E31-1, and up to ten user patterns.

**Error insertion (BERT)**
- BES: Block Error Sequence
- Internal clock output
- Error measurement: LAN/WAN, jitter/bit error, test, duration, over/under, average, average, E4/E8/E6/E8 Block

**Alarm insertion**
- LOS, line down, local fault, remote fault, alarm indicator.

**Alarm detection**
- DS1: LOF, AIS-L, RD-IP, LOF-P.

**Service disruption time measurement (BERT)**
- Detect or NO Traffic mode. Disruption time statistics include shortest, longest, last, average, total and count.

**Multistream generation**
- Capability to generate streams with up to three layers of VLAN (including 802.1ah Q-in-Q tagged VLAN) and to filter received traffic by VLAN ID or VLAN priority at any of the stacked VLAN layers.

**Traffic filtering**
- Capability to analyze the incoming traffic and provide statistics according to a set of up to ten configurable filters. Filters can be configured for MAC source/destination address, VLAN ID, VLAN priority, IP source/destination address, ToS field, DSCP field, TCP source/destination port and UDP source/destination port. VLAN filtering can be applied to any of the stacked VLAN layers.

**Ethernet statistics**
- Multicast, broadcast, unicast, N-unicast, pause frame, frame size distribution, bandwidth, utilization, frame rate, frame loss, out-of-sequence frames, in-sequence frames.

**Packet filter statistics**
- Delay variation statistics (ms): min, max, mean, last, average, jitter measurement estimate.

**Flow control injection (frame analyzer)**
- Packet pause time.

**Advanced filtering**
- Capability to configure up to ten filters of four fields each that can be combined with AND/OR/NOT operations. A mask is also provided for each defined filter.

**Data capture**
- Capability to perform 10G full-line-rate data capture and decode. Capability to configure detailed capture filters and triggers as well as capture parameters.

**Traffic scan**
- Capability to scan incoming live traffic and auto-discover all VLANs/VLAN Priority and MPLS ID/COS flows. Capability to provide statistics for each flow including frame count and bandwidth.

**PBB-TE**
- Capability to generate and analyze streams with PBB-TE data traffic, including configuration of B-MAC (source and destination), B-VLAN, and B-Hag (as per 802.1ah), and to filter received traffic by any of these fields.

**MPLS**
- Capability to generate and analyze streams with up to two layers of MPLS labels and to filter received traffic by MPLS labels.

**IPv6**
- Capability to perform BERT, RFC 2544, traffic generation and analysis and SMART Loopback tests over IPv6. Ping, traceroute, neighbor discovery and stateless auto-configuration.

**ADDITIONAL TEST AND MEASUREMENT FUNCTIONS**

**Power measurement**
- Supports power measurement, displayed in dBm.

**Frequency measurement**
- Supports frequency offset and frequency measurements (i.e., received frequency and deviation of the input signal clock from nominal frequency).

**Frequency offset generation**
- Range: ±120 ppm
- ±1 ppm
- ±4.8 ppm

**Frequency offset measurement**
- Range: ±150 ppm
- ±1 ppm
- ±4.8 ppm

**Signal tap control and monitoring**
- Ability to configure and monitor J0 trace, J1 trace and payload signal label C2 (WAN).

**DSCP client**
- Performs end-to-end, bidirectional performance testing (as required by leading standards bodies)–remote Packet Blazer controlled via the LAN connection under test.

**Service Loopback**
- Ability to return traffic to the local port by swapping packet overhead to layer 4 of the OSI stack.

**IP tools**
- Ability to perform ping and traceroute functions.

**ADDITIONAL FEATURES**

**Expert mode**
- Ability to set thresholds in RFC 2544 and BERT mode to provide a PASS/FAIL status.

**Scripting**
- The built-in Visual Basic .NET scripting engine and embedded macro recorder provide a simple means of automating test cases and routines.

**Event log**
- Supports logging of test results, and the ability to print, export to a file, or export the information contained in the logging tool.

**Power up and restore**
- In the event of a power failure to the unit, the active test configuration and results are saved and restored upon bootup.

**Save and load configuration**
- Ability to store and load test configurations to/from non-volatile memory.

**Configurable test views**
- Allows users to customize their test views, i.e., to dynamically insert or remove test tabs/windows, in addition to creating new test windows, so as to accurately match their testing needs.

**Concurrent test timer**
- Allows a user to set a specific start and stop time for tests.

**User profiles**
- Ability to select and load from predefined or user-modified test configurations.

**Report generation**
- Ability to generate test reports in the following user-selectable formats: .pdf, .html, .txt and .csv.

**Graph**
- Allows to display the test statistics of the performance (RFC 2544) and frame analysis tests.

**Screen capturing**
- Capability to capture a snapshot of the screen for future use.

**Logger printing**
- Capability to send logger messages to a supported local printer.

**Remote control**
- Remote control via Visual Guardian Lite software or VNC.

**Notes**
- a. Available as an option.
- b. Available on the FTB-200 platform only.
- c. Available on the FTB-600 and IQS-600 platforms only.
**Module Specifications**

<table>
<thead>
<tr>
<th></th>
<th>FTB-8510G-LAN</th>
<th>FTB-8510G-WAN</th>
<th>FTB-8510G-LAN/WAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port</td>
<td>One 10 Gigabit Ethernet port</td>
<td>One 10 Gigabit Ethernet port</td>
<td>One 10 Gigabit Ethernet port</td>
</tr>
<tr>
<td>Connector type</td>
<td>LC</td>
<td>LC</td>
<td>LC</td>
</tr>
<tr>
<td>Optical transceiver</td>
<td>850 nm optics (10GBASE-SR)</td>
<td>850 nm optics (10GBASE-SW)</td>
<td>850 nm optics (10GBASE-SR/SW)</td>
</tr>
<tr>
<td></td>
<td>1310 nm optics (10GBASE-LR)</td>
<td>1310 nm optics (10GBASE-LW)</td>
<td>1310 nm optics (10GBASE-LR/LW)</td>
</tr>
<tr>
<td></td>
<td>1550 nm optics (10GBASE-ER)</td>
<td>1550 nm optics (10GBASE-EW)</td>
<td>1550 nm optics (10GBASE-ER/EW)</td>
</tr>
<tr>
<td>Port capacity</td>
<td>Full-line-rate traffic generation and analysis</td>
<td>Full-line-rate traffic generation and analysis</td>
<td>Full-line-rate traffic generation and analysis</td>
</tr>
<tr>
<td>Ethernet testing</td>
<td>RFC 1242, RFC 2544, RFC 3393, multistream traffic generation and analysis, EtherBERT</td>
<td>RFC 1242, RFC 2544, RFC 3393, multistream traffic generation and analysis, EtherBERT</td>
<td>RFC 1242, RFC 2544, RFC 3393, multistream traffic generation and analysis, EtherBERT</td>
</tr>
</tbody>
</table>

**General Specifications**

<table>
<thead>
<tr>
<th></th>
<th>FTB-8510G-LAN</th>
<th>FTB-8510G-WAN</th>
<th>FTB-8510G-LAN/WAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (H x W x D)</td>
<td>96 mm x 25 mm x 280 mm</td>
<td>(3 ¾ in x 1 in x 11 in)</td>
<td>(3 ¾ in x 1 in x 11 in)</td>
</tr>
<tr>
<td>Weight (without transceiver)</td>
<td>0.5 kg</td>
<td>(1.2 lb)</td>
<td>(1.2 lb)</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>operating</td>
<td>0 °C to 40 °C</td>
<td>(32 °F to 104 °F)</td>
<td></td>
</tr>
<tr>
<td>storage</td>
<td>−40 °C to 60 °C</td>
<td>(−40 °F to 140 °F)</td>
<td></td>
</tr>
</tbody>
</table>

**Ordering Information**

**Module**

<table>
<thead>
<tr>
<th>FTB-8510G-XX-XX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
</tr>
<tr>
<td>FTB-8510G-LAN = Packet Blazer 10 GigE, 1 port 10 Gigabit Ethernet LAN PHY (10.3125 Gbit/s)</td>
</tr>
<tr>
<td>FTB-8510G-WAN = Packet Blazer 10 GigE, 1 port 10 Gigabit Ethernet WAN PHY (9.953 Gbit/s)</td>
</tr>
<tr>
<td>FTB-8510G-LAN/WAN = Packet Blazer 10 GigE, 1 port 10 Gigabit Ethernet LAN and WAN PHY (10.3125 and 9.953 Gbit/s)</td>
</tr>
<tr>
<td>Example: FTB-8510G-LAN-MPLS</td>
</tr>
</tbody>
</table>

**Transceiver**

| FTB-85900 = 10GBase-SR/-SW (850 nm, LAN/WAN PHY) LC connectors; optical XFP transceiver module for 8510G Packet Blazer |
| FTB-85901 = 10GBase-LR/-LW (1310 nm, LAN/WAN PHY) LC connectors; optical XFP transceiver module for 8510G Packet Blazer |
| FTB-85902 = 10GBase-ER/-EW (1550 nm, LAN/WAN PHY) LC connectors; optical XFP transceiver module for 8510G Packet Blazer |

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.