100G/40G ETHERNET TEST MODULE

FTB-85100G

Packet Blazer

NETWORK TESTING–
TRANSPORT AND DATACOM

The industry's first portable 100 Gbit/s Ethernet tester

- Purpose-built for applications where thorough testing, portability, true ruggedness and ease of use are required
- Fully integrated functionality for fully assessing layer 1/2/3 performance of 100 Gbit/s and 40 Gbit/s Ethernet equipment and network services
- EtherBERT™ test functionality for verifying the integrity of 100 Gbit/s and 40 Gbit/s Ethernet running on WDM networks
- Fast performance/functionality validation of CFP, CXP and QSFP transceivers, in the lab or in the field
- 100 Gbit/s switch and router engine stress tests against demanding corner cases with full-line-rate Ethernet and IP packet generation at over 148 million packets per second
- OTU4-ready hardware for easy testing of advanced technologies
- A single instrument for lab testing, field trials and early deployments, maximizing the return on investment and reducing the risk throughout the product lifecycle

Platform Compatibility

- FTB-500 Portable platform

Next-Generation Network Assessment

EXPERTISE REACHING OUT

100 Gbit/s Ethernet–A Rapidly Emerging Market

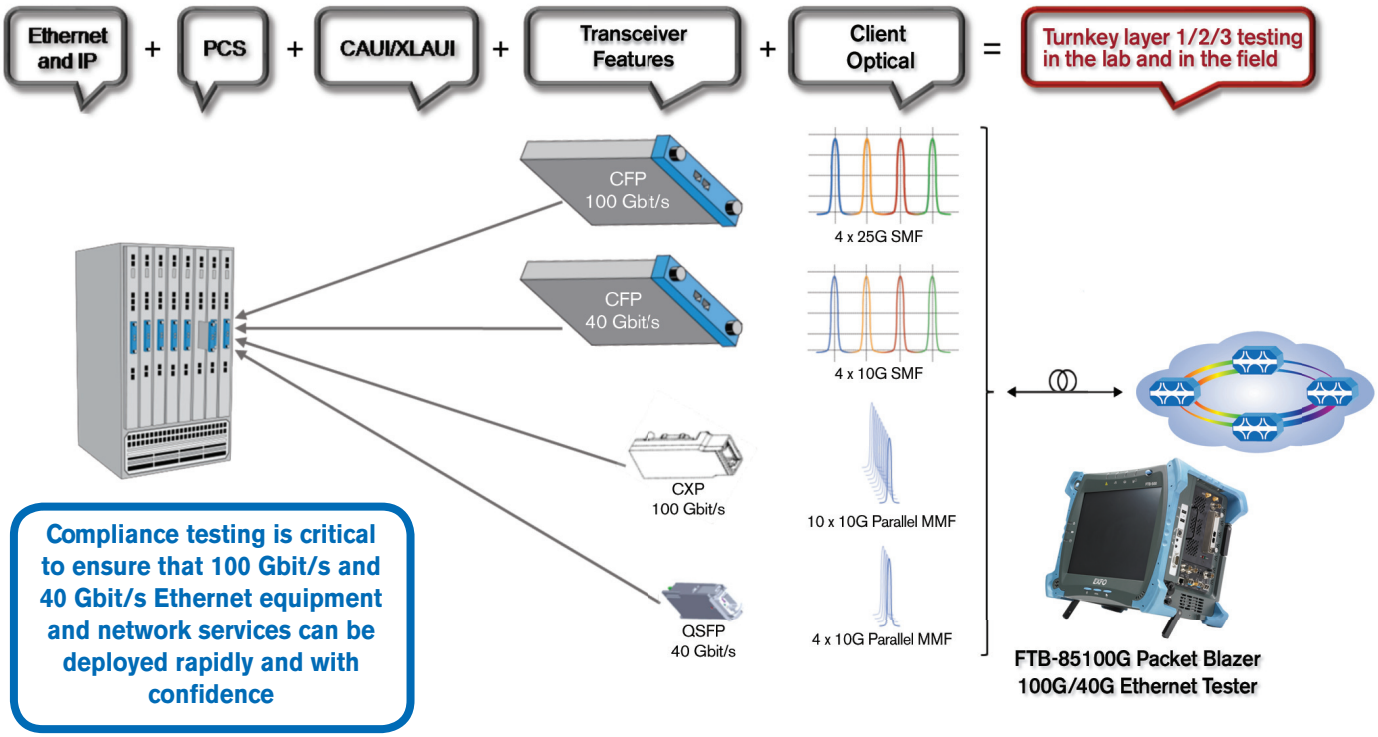
The ongoing growth of enterprise, residential and mobile multimedia services (such as peer-to-peer, IPTV and video-over-the-Internet) is producing unprecedented levels of traffic, stressing the bandwidth capabilities of metro and core transport networks. Consequently, carriers worldwide are actively seeking strategies to efficiently and cost-effectively scale the transmission of IP packets. Specifically intended to facilitate this transition, 100 Gbit/s and 40 Gbit/s Ethernet technologies offer carriers the flexibility to phase in the implementation of these higher-speed rates to better align capacity increases with their specific growth and budget strategies.

These new data rates are based on the IEEE 802.3ba task force initiative. Although not yet fully ratified, the current draft proposes Ethernet interface implementations at 100 Gbit/s and 40 Gbit/s.

The most significant concept introduced in this working standard is the use of parallel optics (including CWDM, LAN WDM and parallel ribbon fiber), which strongly influence the physical coding sublayer (PCS) implementation–one of the new building blocks for 40 Gbit/s and 100 Gbit/s Ethernet. The key difference between the IEEE 802.3ba standard and its most popular lower-rate predecessor is the introduction of PCS lanes (formerly known as virtual lanes). PCS lanes provide an effective method of handling various parallel optical configurations and therefore demand a comprehensive solution that can easily test from 10 x 10 Gbit/s to 4 x 25 Gbit/s and, in the future, 2 x 50 Gbit/s and 1 x 100 Gbit/s configurations. Thorough PCS testing is among the critical layer 1/2/3 tests needed to ensure that 100 Gbit/s and 40 Gbit/s Ethernet equipment and network services can be deployed rapidly and with confidence.

Many products are expected to be available when the standard is ratified in June 2010 and some pre-production units will be available sooner for trial. However, with the standard being in flux and the market being at an early stage, manufacturers and carriers are challenged to find comprehensive testing solutions that enable diverse teams to carry out tests and trials as well as deploy these technologies confidently while making the best use of their investment.

100 Gbit/s Ethernet Networks: What and Where to Test



Compliance testing is critical to ensure that 100 Gbit/s and 40 Gbit/s Ethernet equipment and network services can be deployed rapidly and with confidence

The Industry's First Rugged and Portable 100 Gbit/s Ethernet Compliance Tester

The first rugged and portable 100 Gbit/s Ethernet analyzer on the market, the FTB-85100G Packet Blazer enables teams to efficiently share the equipment in the lab, perform field trials and carry out early deployments, all with a single tester. Purpose-built for applications where thorough testing, portability, true ruggedness and ease of use are required, it offers powerful layer 1/2/3 traffic generation and analysis features to stress and validate network elements and services against demanding corner cases.

The FTB-85100G supports multiple transceiver interfaces (CFP, CXP and QSFP) and offers unprecedented full-line-rate testing of the physical coding sublayer (PCS). Users can also generate and analyze 100 Gbit/s and 40 Gbit/s line rate Ethernet and IP packets, as well as perform comprehensive EtherBERT™ tests, all via an intuitive graphical user interface (GUI).

With its complete range of test features and automation capabilities, the FTB-85100G can execute multilayer testing to rapidly validate physical-layer characteristics and accurately benchmark Ethernet/IP performance of equipment and services. Its flexible and scalable FPGA-based architecture ensures rapid and seamless incorporation of updates as the standard is ratified and refined moving forward, protecting your testing investment without sacrificing timely support of features and functions.

Key Features

Detailed compliance testing	IEEE 802.3ba draft 2.2 CFP MSA draft 1.0 and CFP MSA Management Interface draft 1.0
Multi-interface support	MSA-compliant pluggable CFP, CXP and QSFP transceivers 100GBASE-SR10/LR4/ER4, 40GBASE-SR4/LR4 and 10 x 10G SMF optical interfaces High-speed reference clock output
Robust layer 1 validation (100/40 Gbit/s Ethernet)	Inject and monitor errors on CAUI (100G) and XLAUI (40G) lanes Perform PCS lane alignment and synchronization validation Define and monitor PCS lane mappings and PCS lane skew Inject and monitor PCS lane errors Monitor link status Validate PCS robustness beyond the IEEE 802.3ba specification
Wire-speed testing (layers 2 and 3)	Send and analyze over 148 million packets per second using Ethernet and optional IP packet headers Perform stress tests on forwarding and QoS engines by sending and monitoring corner-case packet sizes , both random and fixed Inject and monitor CRC and payload errors Control Tx bandwidth usage and monitor Rx bandwidth statistics Report common Ethernet and IP statistics
Remote control	Remote access using VNC, WebVNC or Visual Guardian Lite 85100G client software Remote control for automated testing

Technical Specifications

EXFO's 100G/40G Ethernet Test solution is comprised of the FTB-85100G module housed inside the FTB-500 portable platform. This fully integrated solution offers unmatched test automation, minimizing manual intervention and ensuring accurate, repeatable results.

For complete technical specifications on the FTB-500 Integrated Qualification System, go to the FTB-500 product page on our website.

FTB-85100G Packet Blazer Module Specifications

CFP INTERFACE

Mechanical	Compliant with CFP MSA draft 1.0
Electrical	Compliant with CFP MSA draft 1.0 High-speed interface compliant with IEEE 802.3ba draft 2.2
Management	Compliant with CFP MSA management interface draft 1.0

ADDITIONAL FEATURES ON HIGH-SPEED ELECTRICAL INTERFACE (CAUI/XLAUI)

Frequency measurement accuracy (uncertainty)	4.6 ppm using internal clock
Frequency offset generation	± 120 ppm

SYNCHRONISATION INTERFACES

	External Clock DS1/1.5M	External Clock E1/2M	External Clock E1/2M	2 MHz (Trigger)
Tx pulse amplitude (V)	2.4 to 3.6	3.0	2.37	0.75 to 1.5
Tx pulse mask Tx LBO	GR-499 figure 9.5	G.703 figure 15	G.703 figure 15	G.703 figure 20
Pre-amplification (typical) (dBdsx)	0.6 (0 to 133 ft) 1.2 (133 to 266 ft) 1.8 (266 to 399 ft) 2.4 (399 to 533 ft) 3.0 (533 to 655 ft)			
Rx level sensitivity	TERM: ≤ 6 dB (cable loss only) (at 772 kHz for T1) DSX-MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only)	TERM: = ≤ 6 dB (cable loss only) MON: ≤ 26 dB (20 dB resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only)	TERM: = ≤ 6 dB (cable loss only) MON: ≤ 26 dB (resistive loss + cable loss ≤ 6 dB) Bridge: ≤ 6 dB (cable loss only)	≤ 6 dB (cable loss only)
Transmission bit rate	1.544 Mbit/s ± 4.6 ppm	2.048 Mbit/s ± 4.6 ppm	2.048 Mbit/s ± 4.6 ppm	
Reception bit rate	1.544 Mbit/s ± 50 ppm	2.048 Mbit/s ± 50 ppm	2.048 Mbit/s ± 50 ppm	
Intrinsic jitter (Tx)	ANSI T1.403 section 6.3 GR-499 section 7.3	G.823 section 6.1	G.823 section 6.1	G.703 table 11
Input jitter tolerance	AT&T PUB 62411 GR-499 SECTION 7.3	G.823 section 7.2 G.813	G.823 section 7.2 G.813	
Line coding	AMI and B8ZS	AMI and HDB3	AMI and HDB3	
Input impedance (resistive termination)	75 Ω ± 5 %, unbalanced	75 Ω ± 5 %, unbalanced	75 Ω ± 5 %, unbalanced	75 Ω ± 5 %, unbalanced
Connector type	BNC [a]	BNC [a]	BNC	BNC

Note
a. Adaptation cable required for Bantam connector (EXFO part number: TJ-ELEC-BALUN).

REF-OUT INTERFACE

	Low Speed	High Speed
Tx pulse amplitude	600 ± 200 mVpp	600 ± 200 mVpp
Transmission frequency	161 MHz to 699 MHz	3.2 GHz to 3.5 GHz
Output configuration	AC-coupled	AC-coupled
Load impedance	50 ohms	50 ohms
Maximum cable length	1 meter	1 meter
Connector type	SMA	SMA

MECHANICAL AND ENVIRONMENTAL SPECIFICATIONS

Size (H x W x D)		96 mm x 152 mm x 292 mm	(3 3/4 in x 6 in x 11 1/2 in)
Weight		2.5 kg	(5.5 lb)
Temperature	operating	0 °C to 40 °C	(32 °F to 104 °F)
	storage	–40 °C to 60 °C	(–40 °F to 140 °F)

FTB-85100G Packet Blazer
100G/40G Ethernet Test Module

ORDERING INFORMATION

TK-500-85100G-XX-XX-XX-XX-XX

Display
S1 = TFT active screen
S2 = Outdoor-enhanced screen

Module capacity [a]
OCT = Eight-slot module capacity

Battery [a]
BTY = With batteries

Options
00 = Without software option
ETHERNET = Support Ethernet packets [b]
IP = Support IP packets [b]
PCS = Support 802.3ba PCS testing

Rates
40G = 40 Gbit/s Ethernet and 43G rate
100G = 100 Gbit/s Ethernet and 112G rate [a]

Example: TK-500-85100G-S1-OCT-BTY-40G-100G-PCS-ETHERNET

Notes

a. Always included.
b. PCS required.

Transceivers and accessories

FTB-85951 = 100 Gbit/s Ethernet CFP transceiver (10 x 10G WDM)
FTB-85941 = CFP to QSFP adapter module
FTB-85940 = CFP to CXP adapter module

Complementary Products

FTB-8510G Packet Blazer

Housed in the FTB-400, FTB-500 and FTB-200 platforms, 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. For more information on the FTB-8510G, please refer to its detailed spec sheet at http://documents.EXFO.com/specsheets/FTB-8510G-ang.pdf.

FTB-8140 Transport Blazer

The FTB-8140 Transport Blazer test module includes an intuitive, feature-rich user interface to streamline testing of OC-768, STM-256 and OTN links with ITU-T G.709 forward error correction (FEC), without compromising on functionality. It can automate next-generation SONET/SDH/OTN and ROADM testing with a broad range of SCPIs to address growing requirements of network equipment vendors in system verification, manufacturing and troubleshooting of network elements.

For more information on the FTB-8140, please refer to its detailed spec sheet on the product page at http://documents.exfo.com/specsheets/FTB-8140-angHR.pdf.

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