ETS-1000G

ETHERNET ANALYZER

The smallest and most cost-effective 10M to 10G Ethernet analyzer on the market for Carrier Ethernet turn-up and troubleshooting.

KEY FEATURES

A full range of Ethernet link speeds: from 10 Mbit/s up to 10 Gbit/s (LAN and WAN)

Throughput, back-to-back, latency and frame-loss measurements, as per RFC 2544 (asymmetrical results optional)

Up-to-10 traffic stream generation and analysis, perfect for turning up next-generation Ethernet services

EtherBERT™ testing of 10 Mbit/s, 100 Mbit/s, 1000 Mbit/s and 10 Gbit/s Ethernet circuits

Multiprotocol label switching (MPLS) support for Carrier Ethernet

Packet jitter measurement for qualification of Ethernet transport networks for transmission of delay-sensitive traffic

Loopback modes: layers 1 to 4

Operations, administration and maintenance (OAM) testing: 802.3ah

Intelligent discovery of existing ETS-1000, ETS-1000L and ETS-1000G on a network with loopback to them

TCP/IP network configuration test suite and troubleshooting tools: includes TCP client, DNS lookup, ARP monitor, MAC, VLAN and IP flooding, ping and traceroute

Remote-control capability

EXFO

FIELD ASSESSMENT OF CARRIER ETHERNET SERVICES

EXFO's ETS-1000G is the smallest and most cost-effective 10M to 10G Ethernet analyzer on the market. This analyzer enables service providers to turn up and troubleshoot next-generation Carrier Ethernet services. Its compact size, combined with a complete feature set, makes it the perfect tool for field technicians who need to reliably validate service-level agreements (SLAs) for Ethernet-based services.

Using this analyzer, technicians can transmit up to layer-4 traffic with fully configurable virtual local area networks (VLANs), multiprotocol label switching (MPLS) and quality of service (QoS) parameters. The ETS-1000G supports all of today's necessary Ethernet/IP field-testing capabilities for troubleshooting, including RFC 2544, bit-error-rate testing (BERT), packet jitter, and multistream generation and analysis.

TESTING APPLICATIONS

QoS Assessment

The ongoing deployment of GigE and 10 GigE circuits across access and metro networks requires a testing solution that can seamlessly adapt to either operating environment without sacrificing portability, speed or cost—while guaranteeing the performance and QoS metrics of these services.

The ETS-1000G assesses Ethernet services through its complex traffic capability, allowing for simultaneous testing of up to 10 streams representing different applications. Key performance indicators (KPIs) such as throughput, latency and frame loss are measured for each individual stream.


Service turn-up testing
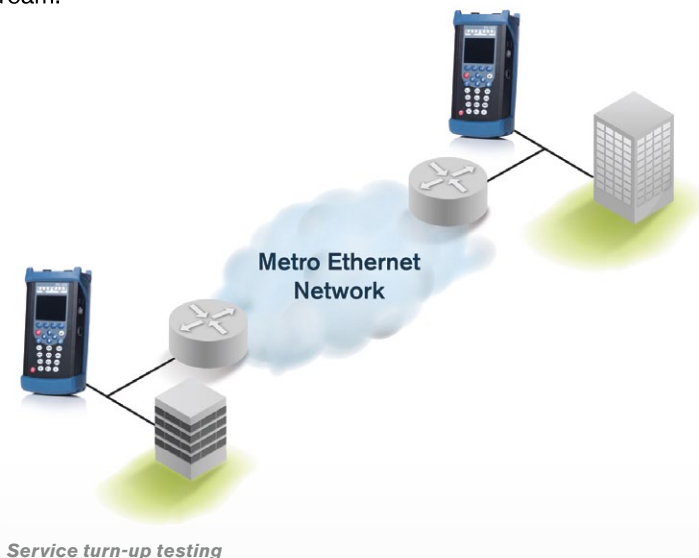
RFC 2544

RFC 2544 remains one of the most-used methodologies for Ethernet service turn-up. The ETS-1000G supports two RFC 2544 configurations. The first has a loopback at the remote end to provide round-trip results, and the second offers asymmetrical testing providing separate results for each test direction.

RFC 2544 Results

RFC 2544 Graph

EXFO
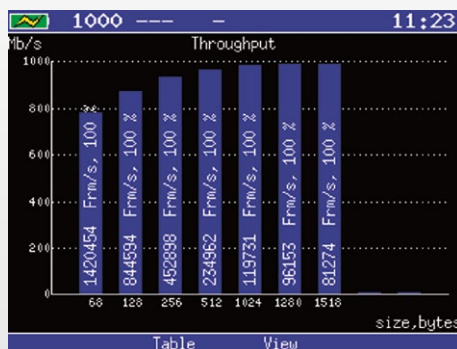
EtherBERT

The ETS-1000G's bit-error-rate test feature makes it possible to switch from a frame-based error measurement to a bit-error-rate measurement. The BERT can be performed at physical, data link, network and transport layers using standard and user-defined sequences. This feature also allows for generation of static as well as random frame sizes.

MPLS Testing

The MPLS testing option allows for generation of traffic with up to three MPLS labels. RFC 2544, multistream and BER tests can be performed with MPLS traffic, enabling field technicians to test within the MPLS network and verify proper label routing and prioritization.

TCP/IP Network Configuration Test Suite

The ETS-1000G offers a network configuration test suite enabling technicians to simply verify network connectivity and validate proper configuration. Using these tests, users can detect network configuration problems, verify server availability, verify operability and estimate the load of the link. The network configuration test suite includes the following tests:

> MAC, VLAN and IP flooding to determine the stability of routers and switches

> DNS lookup

> An address resolution protocol (ARP) monitor to observe ARP replies transmitted in the network and retrieve the IP and MAC addresses they contain

> TCP-client, which verifies whether a tested server responds to HTTP requests

> Ping and traceroute

Reports, Test Configurations and Remote Control

The ETS-1000G analyzer can be used to save complete test results. It is also possible to load and view previously saved results and configurations directly on the unit. The user has the ability to take screen captures of the ETS-1000G user interface. It is also possible to gain full remote control of the ETS-1000G via the tester's LAN port and USB port.

SPECIFICATIONS [a]

SFP INTERFACE [b]			
Transceiver Type	**1000Base-SX**	**1000Base-LX**	**1000Base-ZX**
Model	FTB-8590	FTB-8591	FTB-8592
Wavelength (nm)	850	1310	1550
Transmission level (dBm)	−9 to −3	−9.5 to −3	0 to 5
Reception level sensitivity (dBm)	−20	−19	−22
Maximum reach	550 m	10 km	80 km
Transmission bit rate (Gbit/s)	1.25	1.25	1.25
Reception bit rate (Gbit/s)	1.25	1.25	1.25
Transmission operational wavelength range (nm)	830 to 860	1270 to 1360	1540 to 1570
Maximum reception before damage (dBm)	6	6	6
Ethernet classification	IEEE 802.3	IEEE 802.3	
Laser type	VCSEL	FP	DFB
Eye safety	Class 1	Class 1	Class 1
Connector	LC	LC	LC

Notes

a. Valid at 23 °C to ± 3 °C

b. Typical

EXFO

SFP+ INTERFACE [a]

Transceiver Type	10G Base-SR/SW	10G Base-LR/LW	10G Base-ER/EW
Model	FTB-8690	FTB-8691	FTB-8692
Wavelength (nm)	850	1310	1550
Tx level (dBm)	−5 to −1	−8.2 to 0.5	−4.7 to 4
Rx level sensitivity (dBm)	−11.1	−12.6	−14.1
Maximum reach	300 m	10 km	40 km
Tx bit rate (Gbit/s)	9.95 to 10.3	9.95 to 10.3	9.95 to 10.3
Rx bit rate (Gbit/s)	9.95 to 10.3	9.95 to 10.3	9.95 to 10.3
Tx operational wavelength range (nm)	840 to 860	1260 to 1355	1530 to 1565
Maximum Rx before damage (dBm)	6	5	5
Laser type	VCSEL	DFB	CML
Eye safety	Class 1	Class 1	Class 1
Connector	LC	LC	LC

ELECTRICAL INTERFACE

Electrical interfaces	10 Base-T	100 Base-T	1000 Base-T
Transmission bit rate	10 Mbit/s	125 Mbit/s	1 Gbit/s
Transmission accuracy (ppm)	±100	±100	±100
Reception bit rate	10 Mbit/s	125 Mbit/s	1 Gbit/s
Duplex mode	Half and full duplex	Half and full duplex	Full duplex
Connector	RJ-45	RJ-45	RJ-45

Note
a. Typical

EXFO

FUNCTIONAL SPECIFICATIONS

TESTING

RFC 2544	Throughput, back-to-back, frame-loss and latency measurements according to RFC 2544 (option for asymmetrical results). Frame size: RFC-defined sizes, user-configurable.
BERT	Layer 1 to layer 4 with or without VLAN and MPLS. Traffic generation with static and random frame size (from 64 to 9600 bytes).
Patterns (BERT)	CRTP, PRBS 2E11-1, PRBS 2E15-1, PRBS 2E20-1, PRBS 2E23-1, PRBS 2E29-1, PRBS 2E31-1 and user patterns
Error measurement	Jabber/giant, runt, CRC
Error measurement (BERT)	Bit error, LSS and LOS
Multistream generation and analysis	Ability to transmit and analyze up to 10 streams. Configuration parameters are: packet size, transmission rate, MAC source/destination address, VLAN ID, VLAN priority, IP source/destination address, TOS field, DSCP field, TTL, UDP source/destination port and payload. MPLS tags can also be inserted. Analysis is performed on all 10 streams simultaneously, including throughput, frame count and latency.
MPLS [a]	Ability to generate and analyze streams with up to three layers of MPLS labels.
Ethernet statistics	Multicast, broadcast, unicast, frame rate, frame loss, out-of-sequence frames, in-sequence frames.
Delay variation	Delay-variation measurements according to RFC 4689, packet jitter distribution and latency distribution.
802.3ah (OAM)	Ability to test Ethernet OAM as per IEEE 802.3ah, including connection establishment, OAM protocol statistics and loopback control.
TCP/IP network configuration test suite	DNS lookup, ARP monitor, TCP client, ping and traceroute
MAC, VLAN and IP flooding [a]	Traffic generation with random source MAC addresses, VLAN labels or IP Address
Loopback	Ability to return traffic to the local unit by swapping packet overhead up to layer 4 of the OSI stack. Ability to loopback packets at layer 1 (without swapping).
DHCP client	Ability to connect to a DHCP server to obtain its IP address and subnet mask for connection to the network.
Remote loopback	Ability to connect, enable and disable loopback of a remote unit.

ADDITIONAL FEATURES

Save and load configuration	Ability to store and load test configurations.
Report generation	Ability to generate test reports in text and CSV formats.
Screen capturing	Ability to take a screenshot for future use.
Graph	Enables graphical display of the test statistics of the test results.
Configurable test timer	Allows the user to set the duration of the test.
Event logger	Provides useful information such as test time and test type.
Remote control	Remote control via a USB or LAN port.

GENERAL SPECIFICATIONS

Size (H x W x D)	222 mm x 112 mm x 70 mm
Weight	1.1 kg
Temperature operating storing	0 °C to 35 °C −10 °C to 45 °C
Relative Humidity	40 % to 90 %, noncondensing
Battery life (in normal mode)	Up to 2 hours
Language	English

Note

a. Available as a software option.

EXFO

ORDERING INFORMATION

ETS-1000G-XX

Software options ■
XMPLS = **MPLS**
   Ability to generate and analyze traffic with MPLS
XAT = **Asymmetrical RFC 2544**
   Ability to perform asymmetric RFC 2544 and BERT
XADV = **Advanced IP Testing**
   MAC and VLAN flooding

Example: ETS-1000G-XADV

EXFO Headquarters > Tel.: +1 418 683-0211 | Toll-free: +1 800 663-3936 (USA and Canada) | Fax: +1 418 683-2170 | info@EXFO.com | **www.EXFO.com**

EXFO serves over 2000 customers in more than 100 countries. To find your local office contact details, please go to **www.EXFO.com/contact**.

For the most recent version of this spec sheet, please go to the EXFO website at **www.EXFO.com/specs**.

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

EXFO