IQS-8510G

Packet Blazer

R&D AND MANUFACTURING–TRANSPORT AND DATACOM

COMPLETE IPv6 TESTING

Performance assurance for Ethernet-based frame services

- LAN and WAN PHY capability in a single module
- Fully integrated functionality for assessing the performance of Ethernet transport networks
- Complete EtherSAM™ (ITU-T Y.1564) test suite. EtherSAM is the new standard for testing Ethernet mobile backhaul and commercial services
- Throughput, burstability (back-to-back), latency and frame loss measurements as per RFC 2544
- EtherBERT™ test functionality for assessing the integrity of 10 Gigabit Ethernet running on WDM networks
- Multistream generation and analysis, allowing quality of service (QoS) verification through VLAN and TOS/DSCP prioritization testing
- MPLS, MPLS-TP, PBB-TE and IPv4/IPv6 support for complete Carrier Ethernet validation
- Part of EXFO's unified layer 0/1/2/3/4 testing solution

Platform Compatibility

- IQS-600 Integrated Qualification System

EtherSAM

Next-Generation Network Assessment

EXFO | Assessing Next-Gen Networks

The Choice for 10 Gigabit Ethernet Performance Assurance

EXFO's IQS-8510G Packet Blazer™ is a fully featured 10 Gigabit Ethernet test and measurement module that offers performance assurance for Ethernet-based framed traffic. Its suite of test applications provides all the measurements required for validating traffic, loading and service-level agreements (SLAs) between network elements.

The IQS-8510G module supports LAN/WAN PHY and is capable of testing signals in their native format, such as 10GBASE-xR or 10GBASE-xW, which are typically used for transport of Ethernet-based LAN-to-LAN services. It is also ideal for testing next-generation SONET/SDH platforms, hybrid multiplexers, dark fiber or xWDM networks running 10 Gigabit Ethernet interfaces. Whether in a manufacturing, lab or R&D environment, EXFO's Packet Blazer series (IQS-8510B/8510G) of modules simplifies and speeds up the development and deployment of Ethernet-based technology.

EXFO's IQS-8510G Packet Blazer 10 Gigabit Ethernet Test Module is housed in the IQS-600 Integrated Qualification System, EXFO's powerful lab/manufacturing test platform.

Key Features

- Measures throughput, back-to-back (burstability), latency and frame loss as per RFC 2544
- EtherBERT™ for bit-error-rate testing of 10 Gigabit Ethernet circuits
- Performs packet jitter measurement (IP packet-delay variation as per RFC 3393) to qualify Ethernet transport networks for transmission of delay-sensitive traffic such as voice-over-IP (VoIP)
- Q-in-Q capability with the ability to go up to three layers of stacked VLANs
- 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 frame sizes
- UDP, TCP and IP header integrity validation
- Expert mode capability for defining test pass/fail thresholds
- Fully complies with the IEEE's 802.3ae standard
- Pluggable XFP optical module
- End-to-end testing using Smart Loopback
- Service disruption test measurement
- Transmits and analyzes up to ten streams, providing per-stream measurements for throughput, latency, frame loss and packet jitter
- Bidirectional RFC 2544
- Remotely controllable through Visual Guardian Lite software or VNC
- Configurable advanced filters for in-depth network troubleshooting
- PBB-TE and MPLS support for Carrier Ethernet
- Internet protocol version 6 (IPv6 testing)

Manufacturing, Lab and R&D Environments

The one-slot IQS-8510G Packet Blazer module is housed in the IQS-600 Integrated Qualification System, a rack-mount platform ideal for manufacturing, lab and R&D environments. The IQS-600 platform offers up to ten slots that can welcome any combination of modules from EXFO's full range of industry-proven protocol and optical test modules–a first in the industry.

The IQS-600 platform provides an easy-to-use environment to manage your modules, configure your system, launch applications and analyze results. It can be controlled using local applications or through Ethernet, GPIB and RS-232 interfaces.

RFC 2544 Test Suite

At the core of the IQS-8510G Packet Blazer is the compliance with the IETF's RFC 2544 standard, *Benchmarking Methodology for Network Interconnect Devices*, for layer 2 and layer 3 testing. This ensures that the circuit is efficient and error-free at 100 % utilization. As such, this module includes a full array of testing features in support of this standard.

The Packet Blazer supports automated RFC 2544 testing. Automation provides repeatable, accurate, efficient measurements and results through a clear and simple pass/fail indication. In addition, the Packet Blazer delivers reports that can be used for future reference.

Throughput

Throughput is the maximum rate at which none of the offered frames are dropped by the device under test (DUT) or network under test (NUT). For example, the throughput test can be used to measure the rate-limiting capability of a switch. The throughput is essentially equivalent to the bandwidth.

The throughput test allows vendors to report a single value, which has proven to be useful in the marketplace. Since even the loss of one frame in a data stream can cause significant delays while waiting for the higher level protocols to time out, it is useful to know the actual maximum data rate that the device can support. Measurements should be taken over an assortment of frame sizes.

Burst (Back-to-Back)

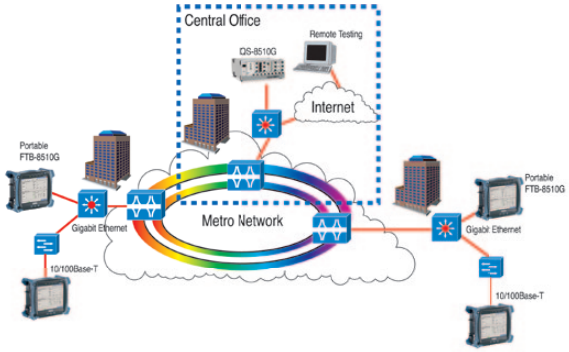
In this test, fixed-length frames are presented at a rate such that there is the minimum legal separation for a given medium between frames over a configurable period of time, starting from an idle state. The back-to-back value is the number of frames in the longest burst that the DUT/NUT will handle without the loss of any frames.

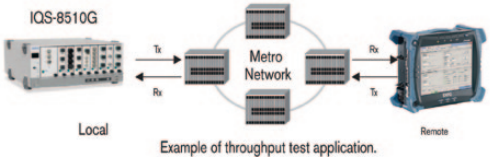
Frame Loss

Frame loss is the percentage of frames that should have been forwarded by a network device under steady state (constant) loads that were not forwarded due to lack of resources. This measurement can be used in reporting the performance of a network device in an overloaded state. This can be a useful indication of how a device would perform under pathological network conditions such as broadcast storms.

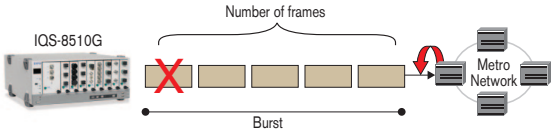
Latency

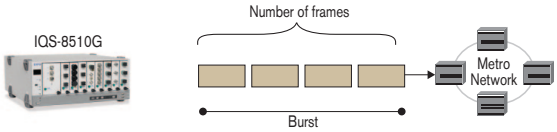
Round-trip latency is the time it takes a bit (cut-through devices) or a frame (store and forward devices) to come back to its starting point. Variability of latency can be a problem. With technologies like voice- and video-over-IP, a variable or long latency can cause significant degradation in quality.



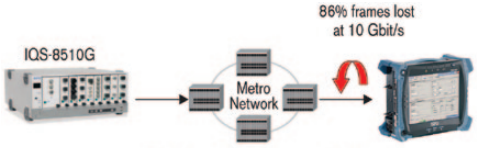


Example of throughput test application.

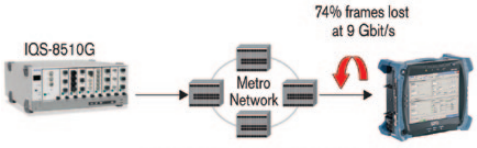




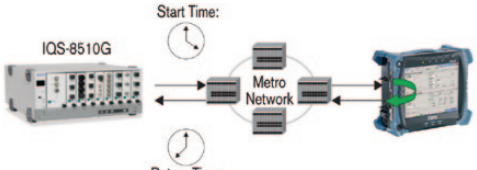
Example of burst (back-to-back) test application.



Example of frame loss test application.



Example of frame loss test application.



Example of latency test application.

Efficient Testing Leads to Reliable Performance

TCP Throughput

Internet protocol (IP) deals with the delivery of packets, while transmission control protocol (TCP) provides the integrity and assurance that the data packets transmitted by one host are reliably received at the destination. Applications such as hypertext transfer protocol (HTTP), e-mail or file transfer protocol (FTP) depend on TCP as their delivery assurance mechanism within networks.

Customers deploying such applications expect not only physical- and link-level SLAs, but also assurance that their TCP traffic requirements will be supported across the network. The TCP Throughput feature on the Packet Blazer offers Ethernet equipment manufacturers and carrier labs the capability of measuring and validating that the services offered to their customers support the TCP traffic performance they expect.

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

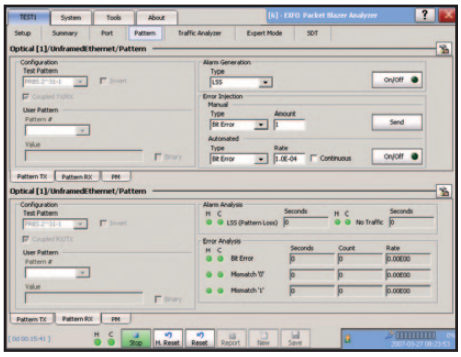
Service providers worldwide are evolving their transport infrastructures to support bandwidth- and quality-intensive services such as voice and video. Network equipment providers must therefore offer IP convergence equipment to edge/metro network operators in a cost-effective and quality-assured manner. 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 IQS-8510G Packet Blazer make it a comprehensive 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).

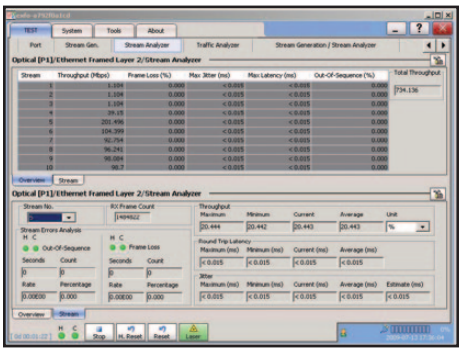
BERT uses a pseudo-random binary sequence (PRBS) encapsulated into an Ethernet frame, making it possible to go from a frame-based error measurement to a bit-error-rate measurement. This provides the bit-per-bit error count accuracy required for acceptance testing of physical-medium transport systems. 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.



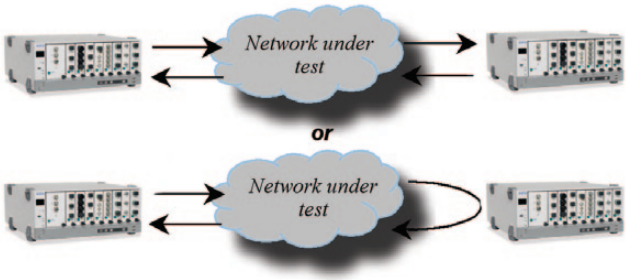
BERT analysis screen.

Ethernet QoS Measurement

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. The IQS-8510G Packet Blazer allows simultaneous simulation and qualification of 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 performance criteria.



Statistics for each stream.



End-to-end testing options.

Flexible End-to-End Testing

With the IQS-8510G Packet Blazer, the user can perform end-to-end testing through control of the remote unit via the LAN connection under test. This unique approach gives service providers access to test results for each direction of test, which is essential to fully qualify Ethernet services. It is also possible to perform end-to-end testing by using the Smart Loopback mode where the remote unit will return traffic to the local unit by swapping packet overhead up to layer 4 of the OSI stack.

Ethernet Advanced Troubleshooting

The IQS-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 IQS-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 IQS-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.

Remote Management

The Visual Guardian Lite™ remote management software, supported on all Transport Blazer and Packet Blazer modules, provides the user with a remote connection to the instrument's graphical user interface (GUI). This identical view of the GUI is supported on any Windows-based workstation and allows for simplified remote testing and data analysis, as well as remote monitoring. Up to five simultaneous Visual Guardian Lite sessions can be supported per test module via a standard Ethernet connection to the platform. For remote testing applications, the Visual Guardian Lite software must be ordered separately.

Automated Test Scripting

Packet Blazer test modules include an extensive SCPI command set for automating test cases and routines using an Ethernet or GPIB interface. The IQS-8510G Packet Blazer also includes a built-in macro recorder, which allows users to easily record their test actions and automatically create test scripts in .NET. This also enables them to build standard test routines that can easily be accessed and run by technicians with little or no manual intervention. Complete documentation and technical support is provided to facilitate the integration of the instrument into your application.

Test Logger and Reporting

EXFO's IQS-8510G Packet Blazer module supports a detailed test logger and test reporting tools, enabling users to view any errors/alarms that occur during the test interval, which can then be used for post-processing of results or SLA conformance validation.

IQS-600 Integrated Qualification System

The IQS-8510G Packet Blazer modules are housed in the IQS-600 Integrated Qualification System, a scalable modular rack-mount platform that is comprised of a controller, expansion units and a comprehensive range of plug-in test modules–ideal for manufacturing, lab and R&D environments. The IQS-600 platform offers up to ten slots, which can support any combination of modules from EXFO's full range of industry-proven protocol and optical test modules. Systems can be expanded to support up to 100 test modules. The IQS-600 family is comprised of the IQS-610P (a ten-slot control unit that can support up to nine IQS-610E ten-slot expansion units) and the IQS-605P (a five-slot control unit with an integrated touch screen). Combined with the built-in IQS Manager software, the IQS-500 platform provides an easy-to-use environment to manage your modules, configure your system, launch applications and analyze results. The IQS-600 can be controlled using local applications or through GPIB, RS-232 or Ethernet interfaces.

EXFO's IQS-8510G Packet Blazer Test Modules are housed in the IQS-600 Integrated Qualification System–EXFO's powerful lab/manufacturing test platform.

Functional Specifications

OPTICAL INTERFACES

	10GBASE-SW	10GBASE-SR	10GBASE-LW	10GBASE-LR	10GBASE-EW	10GBASE-ER
Wavelength	850 nm	850 nm	1310 nm	1310 nm	1550 nm	1550 nm
	Multimode	Multimode	Singlemode	Singlemode	Singlemode	Singlemode
Tx level (802.3ae-compliant)	−7.3 to −1 dBm	−7.3 to −1 dBm	−8.2 to 0.5 dBm	−8.2 to 0.5 dBm	−4.7 to 4.0 dBm	−4.7 to 4.0 dBm
Rx operating range	−9.9 to −1.0 dBm	−9.9 to −1.0 dBm	−14.4 to 0.5 dBm	−14.4 to 0.5 dBm	−15.8 to −1.0 dBm	−15.8 to −1.0 dBm
Transmission bit rate	9.95328 Gbit/s ± 4.6 ppm*	10.3125 Gbit/s ± 4.6 ppm*	9.95328 Gbit/s ± 4.6 ppm*	10.3125 Gbit/s ± 4.6 ppm*	9.95328 Gbit/s ± 4.6 ppm*	10.3125 Gbit/s ± 4.6 ppm*
Reception bit rate	9.95328 Gbit/s ± 150 ppm	10.3125 Gbit/s ± 150 ppm	9.95328 Gbit/s ± 150 ppm	10.3125 Gbit/s ± 150 ppm	9.95328 Gbit/s ± 150 ppm	10.3125 Gbit/s ± 150 ppm
Tx operational wavelength range (802.3ae-compliant)	840 nm to 860 nm	840 nm to 860 nm	1260 nm to 1355 nm	1260 nm to 1355 nm	1530 nm to 1565 nm	1530 nm to 1565 nm
Measurement accuracy (uncertainty)						
Frequency	±4.6 ppm	±4.6 ppm	±4.6 ppm	±4.6 ppm	±4.6 ppm	±4.6 ppm
Optical power	±2dB	±2dB	±2dB	±2dB	±2dB	±2dB
Maximum Rx before damage	0 dBm	0 dBm	1.5 dBm	1.5 dBm	4.0 dBm	4.0 dBm
Jitter compliance	IEEE 802.3ae	IEEE 802.3ae	IEEE 802.3ae	IEEE 802.3ae	IEEE 802.3ae	IEEE 802.3ae
Ethernet classification	IEEE 802.3ae	IEEE 802.3ae	IEEE 802.3ae	IEEE 802.3ae	IEEE 802.3ae	IEEE 802.3ae
Laser type	VCSEL	VCSEL	DFB	DFB	EML	EML
Eye safety	Class 1 laser; complies with 21 CFR 1040.10 and IEC 60825-1	Class 1 laser; complies with 21 CFR 1040.10 and IEC 60825-1	Class 1 laser; complies with 21 CFR 1040.10 and IEC 60825-1	Class 1 laser; complies with 21 CFR 1040.10 and IEC 60825-1	Class 1M laser; complies with 21 CFR 1040.10 and IEC 60825-1	Class 1M laser; complies with 21 CFR 1040.10 and IEC 60825-1
Connector	Duplex LC	Duplex LC	Duplex LC	Duplex LC	Duplex LC	Duplex LC
Transceiver type (compliant with XFP MSA)	XFP	XFP	XFP	XFP	XFP	XFP

* *When clocking is in Internal mode*

SYNCHRONIZATION INTERFACES

DS1/E1 external input clock interface

Parameter	DS1	E1
Rx level sensitivity (short haul only)	For 772 kHz: TERM: 6 dB (cable loss only)	For 1024 kHz: TERM: 6 dB (cable loss only)
Reception bit rate	1.544 Mbit/s ± 50 ppm	2.048 Mbit/s ± 50 ppm
Input jitter tolerance	AT&T PUB 62411, GR-499 section 7.3	G.823 section 7.2
Line coding	AMI and B8ZS	HDB3 and AMI
Input impedance (resistive termination)	100 ohms ± 5 %, balanced	120 ohms ± 5 %, balanced
Connector type	BANTAM	BANTAM

Specifications are subject to change without notice.

Clock out interface

Parameter		Value	
Tx pulse amplitude		600 mVpp ± 130 mV	
Transmission frequency		LAN	WAN
	Clock divider = 16	644.53 MHz	622.08 MHz
	Clock divider = 32	322.266 MHz	311.04 MHz
	Clock divider = 64	161.133 MHz	155.52 MHz
Output configuration		AC coupled	
Load impedance		50 ohms	
Maximum cable length		3 meters	
Connector type		SMA	

Functional Specifications (Cont'd)

OPTICAL INTERFACES

Optical interfaces	10 GigE LAN and 10 GigE WAN
Available wavelengths	850, 1310 and 1550 nm

ELECTRICAL INTERFACES

Electrical interfaces	Ext. clock DS1/E1 and clock output			
Ext. clock DS1/E1	Line coding	DS1: AMI and B8ZS E1: AMI and HDB3	Framing	DS1: SF and ESF E1: PCM30, PCM30CRC, PCM31 and PCM31CRC
	Termination mode	DS1/E1: Term	Clocking	Internal, external (BITS) and recovered
Clock output		Clock out		Clock out divider: 16, 32 and 64

TESTING

EtherSAM (Y.1564)	Capability to perform the Network Configuration Test and Service Test as per ITU-T Y.1564. Tests can be performed to loopback or dual test set mode for bidirectional results.
RFC 2544	Throughput, back-to-back, frame loss and latency measurements according to RFC 2544. Frame size: RFC-defined sizes, user-configurable.
BERT	Unframed layer 1 up to layer 4 with or without VLAN Q-in-Q.
Patterns (BERT)	PRBS 2E9-1, PRBS 2E11-1, PRBS 2E15-1, PRBS 2E20-1, PRBS 2E23-1, PRBS 2E31-1 and up to 10 user patterns.
Error insertion (BERT)	FCS, bit, 64B/66B Block.
Error measurement	LAN/WAN: jabber/giant, runt, undersize, oversize, FCS, 64B/66B Block. WAN: B1, B2, B3, REI-L, REI-P. UDP, TCP and IP header checksum.
Error measurement (BERT)	Bit error, bit mismatch 0, bit mismatch 1, performance monitoring (G.821 and G.826).
Alarm insertion	LOS, link down, local fault, remote fault, LSS (BERT). WAN: SEF, LOF, AIS-L, RDI-L, AIS-P, RDI-P, LCD-P, LOP-P, ERDI-PSD, ERDI-PCD, ERDI-PPD, UNEQ-P.
Alarm detection	LOS, link down, local fault, remote fault, frequency offset, LSS (BERT). WAN: SEF, LOF, AIS-L, RDI-L, AIS-P, RDI-P, LCD-P, LOP-P, ERDI-PSD, ERDI-PCD, ERDI-PPD, PLM-P, UNEQ-P, Link (WIS).
Service disruption time measurement (BERT)	Defect or No Traffic mode. Disruption time statistics include shortest, longest, last, average, total and count.
Multistream generation	Capability to transmit up to ten streams. Configuration parameters are: packet size, transmission mode (N-Frames, Burst, N-Burst, Ramp, N-Ramp and Continuous), MAC source/destination address, VLAN ID, VLAN priority, IP source/destination address, ToS field, DSCP field, TTL, UDP/TCP source/destination port and payload. Selectable predefined stream profiles for voice, video and data streams. VoIP codecs (G.711, G.723.1, G.729), video (MPEG-2 SDTV, MPEG-2 HDTV, MPEG-4 HDTV).
Multistream analysis	Capability to analyze packet jitter, latency, throughput, frame loss and out-of-sequence per-stream statistics.
VLAN stacking	Capability to generate streams with up to three layers of VLAN (including IEEE802.1ad QinQ 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 jitter statistics	Delay variation statistics (ms): min., max., last, average, jitter measurement estimate.
Flow control injection (frame analyzer)	Packet pause time.
Flow control statistics (frame analyzer and RFC 2544)	Pause time, last pause time, max. pause time, min. pause time, paused frames, abort frames, frames Tx, frames Rx.
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 field value to allow for wildcards. Complete statistics are gathered for each defined filter.
PBB-TE	Capability to generate and analyze streams with PBB-TE data traffic, including configuration of B-MAC (source and destination), B-VLAN and I-tag (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 label or COS.
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.
Data capture [a]	Capability to perform up to 10G full-line-rate data capture and decode. Capability to configure detailed capture filters and triggers as well as capture slicing parameters.
Traffic scan [a]	Capability to scan incoming live traffic and auto-discover all VLAN/VLAN Priority and MPLS ID/COS flows. Capability to provide statistics for each flow including frame count and bandwidth.

ADDITIONAL TEST AND MESUREMENT FUNCTIONS

Power measurement	Supports optical power measurement, displayed in dBm.
Frequency generation and measurement	Supports clock frequency generation and measurements (i.e., received frequency and deviation of the input signal clock from nominal frequency). Frequency offset generation: Range: ±120 ppm Resolution: ±1 ppm Accuracy (uncertainty): ±4.6 ppm Frequency offset measurement: Range: ±150 ppm Resolution: ±1 ppm Accuracy (uncertainty): ±4.6 ppm
Signal label control and monitoring	Ability to configure and monitor J0 trace, J1 trace and payload signal label C2 (WAN).
Smart Loopback	Capability to return traffic to the local unit by swapping packet overhead up to layer 4 of the OSI stack.
DHCP client	Capability to connect to a DHCP server to obtain its IP address and subnet mask to connect to the network.
Bidirectional RFC 2544	Performs end-to-end, bidirectional RFC 2544 performance testing (as required by leading standards bodies); remote Packet Blazer controlled via the LAN connection under test.
IP tools	Capability to perform ping and traceroute functions.

Note

a. Available as a software option.

ADDITIONAL FEATURES

Expert mode	Ability to set thresholds in RFC 2544 and BERT mode to provide a pass/fail status.
SCPI automation	Extensive SCPI command set support for automating test cases and routines using a GPIB or LAN interface. Complete documentation and technical support is provided.
Event logger	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.
Configurable test timer	Allows a user to set a specific start and stop time for tests.
Test favorites	Capability to select and load from predefined or user-modified test conditions.
Report generation	Ability to generate test reports in the following user-selectable formats: .pdf, .html, .txt and .csv.
Graph	Allows to graphically display the test statistics of the performance (RFC 2544) and frame analysis tests.
Remote control	Remote control through Visual Guardian Lite software or VNC.

MODULE SPECIFICATIONS

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

Size (H x W x D)		125 mm x 36 mm x 282 mm	(4 15/16 in x 1 7/16 in x 11 1/8 in)
Weight (without transceiver)		0.75 kg	(1.65 lb)
Temperature	operating	0 °C to 40 °C	(32 °F to 104 °F)
	storage	–40 °C to 60 °C	(–40 °F to 140 °F)

ORDERING INFORMATION

IQS-8510G-XX-XX

Model

IQS-8510G-LAN = Packet Blazer 10 GigE, 1 port 10 Gigabit Ethernet LAN PHY (10.3125 Gbit/s)
IQS-8510G-WAN = Packet Blazer 10 GigE, 1 port 10 Gigabit Ethernet WAN PHY (9.953 Gbit/s)
IQS-8510G-LAN/WAN = Packet Blazer 10 GigE, 1 port 10 Gigabit Ethernet LAN and WAN PHY (10.3125 and 9.953 Gbit/s)

Example: IQS-8510G-LAN-MPLS-IPv6

Other options

00 = Without other options
PBB-TE = PBB-TE testing
MPLS = MPLS testing
Adv_filtering = Advanced filtering capabilities
IPv6 = IPv6 testing capabilities
Data_Capture = Data capture and decode capabilities
TRAFFIC-SCAN = VLAN/MPLS traffic scan

Accessories

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

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