

RTU-310G

IP SERVICES TEST HEAD



Fully integrated 10 GigE test head for centralized performance assurance of Ethernet-based services

KEY FEATURES

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 unit

Comprehensive functionality for assessing the performance of Ethernet transport networks

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

MPLS, MPLS-TP and PBB-TE support for complete Carrier Ethernet validation

Interoperable with the FTB-8510B Packet Blazer Ethernet Test Module, the FTB-8510G Packet Blazer 10 Gigabit Ethernet Test Module and the AXS-200/850 Ethernet Test Set

Fully remote controllable via EX-Vu application

 EtherSAM

 MEF
METRO ETHERNET FORUM

 COMPLETE
IP6
TESTING

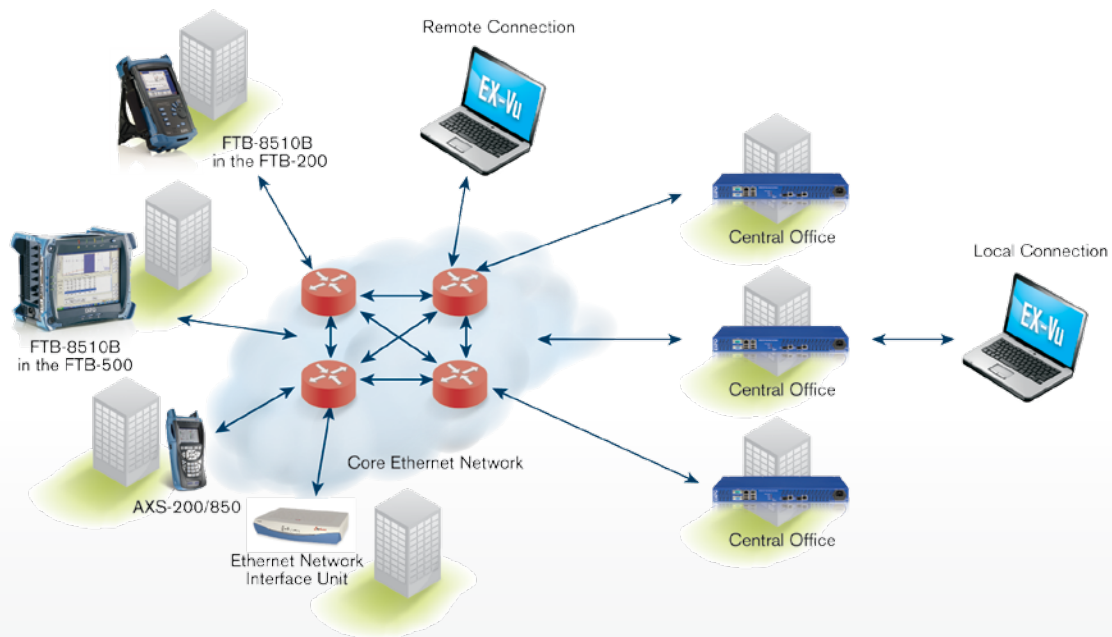
THE CHOICE FOR 10 GIGABIT ETHERNET PERFORMANCE ASSURANCE

EXFO's RTU-310G IP Services Test Head is a carrier-grade test device that offers performance assurance capabilities for 10 Gigabit Ethernet-based services. Its suite of test applications provides all the measurements required for service turn-up, troubleshooting, as well as validating service-level agreements (SLAs) between service providers and their customers. This 1U rack-mounted, central office (CO)-based device—combined with its portable counterparts, EXFO's award winning FTB-8510B Packet Blazer Ethernet Test Module and the FTB-8510G Packet Blazer 10 Gigabit Ethernet Test Module or the AXS-200/850 Ethernet Test Set—simplify and accelerate the deployment of Ethernet services. In fact, the RTU-310G is the functional equivalent of the FTB-8510G and supports all the test features found in the portable version.

FLEXIBLE END-TO-END TESTING FROM A CENTRALIZED POINT

With the RTU-310G IP Services Test Head, 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. For example, up to ten 1 GbE test patterns can be looped back simultaneously, allowing service providers to run multiple tests from different locations all at the same time. This increases the test set's flexibility and makes testing more efficient.

The RTU-310G 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. The RTU-310G 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)
- › 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 video and 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 valid frame sizes
- › Transmits and analyzes up to ten streams, providing per-stream measurements for throughput, latency, frame loss and packet jitter
- › Configurable advanced filters for in-depth network troubleshooting
- › PBB-TE and MPLS support for carrier Ethernet
- › UDP, TCP and IP header integrity validation
- › Expert mode capability for defining test pass/fail thresholds
- › Easy-to-use smart user interface (SUI) for configurable screens, customization of test suites, as well as real-time and historical performance reporting
- › Remote control capability through Ex-Vu or VNC software
- › Smart Loopback
- › Service disruption time measurement
- › Internet protocol version 6 (IPv6) testing
- › Up to 10 Gbit/s full-line-rate data capture and decode

* Patent pending

ETHERSAM: THE NEW STANDARD IN ETHERNET TESTING

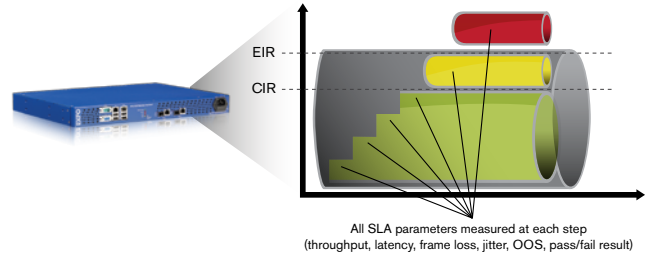
ITU-T Y.156sam is the newly introduced draft standard for turning-up and troubleshooting Carrier Ethernet services. This new methodology is completely adapted to today's Ethernet services especially mobile backhaul and commercial services. Up to now, RFC 2544 has been the most widely used methodology. 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 Service Configuration Test and the Service Performance Test.

ETHERSAM: THE NEW STANDARD IN ETHERNET TESTING (CONT'D)

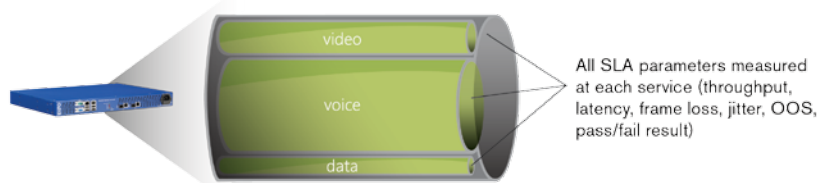
Service Configuration Test

The Service 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.



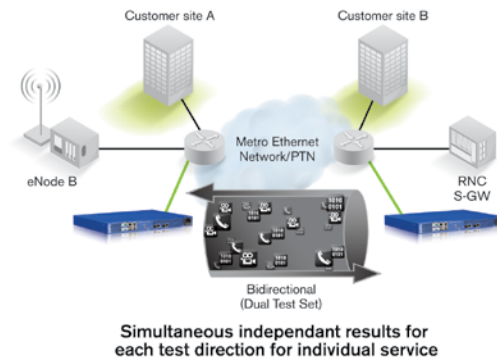
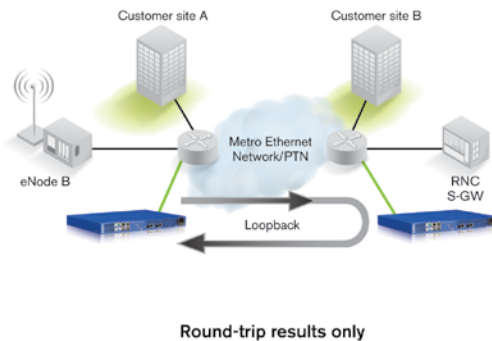
Service Performance Test

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



EtherSAM Bidirectional Results

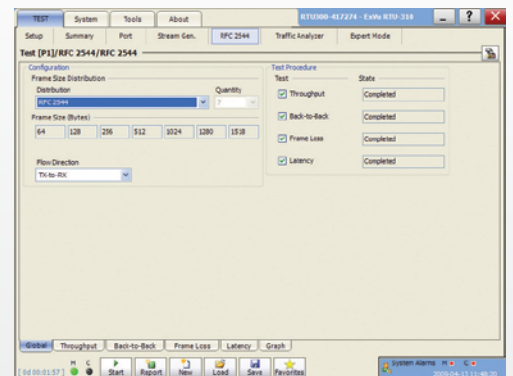
EXFO's EtherSAM approach proves even more powerful as it executes the complete ITU-T Y.156sam test with bidirectional measurements. Key SLA parameters are measured independently in each test direction, thus providing 100 % first-time-right service activation—that is the highest level of confidence in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



RFC 2544 Test Suite

The RTU-310G IP Services Test Head 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 IP services test head supports automated RFC 2544 testing, which helps ensure repeatable results. 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 IP services test head delivers 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

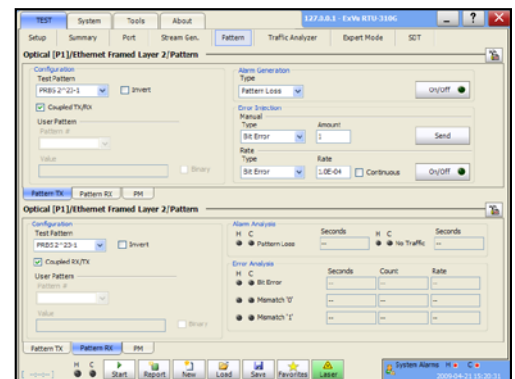
As technologically sophisticated business and residential consumers continue to drive demand for premium, high-bandwidth data services such as voice and video, service providers worldwide are evolving their transport infrastructures to support these bandwidth and quality-intensive services. No longer 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 RTU-310G 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.



BERT analysis screen.

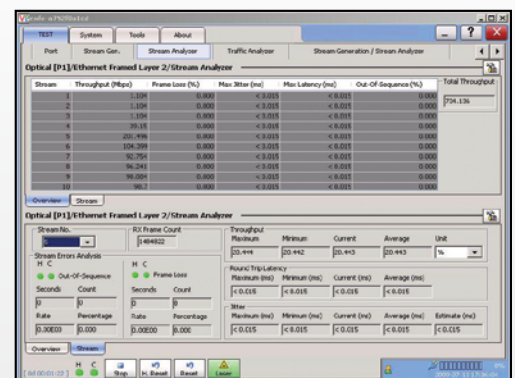
Ethernet QoS Measurement

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 and fully qualify SLA parameters. The RTU-310G 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 RTU-310G 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.

The RTU-310G 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.



Statistics for each stream.

COMMAND AND CONTROL

Remote Management

The user interface for the RTU-310G IP Services Test Head is accessible via EX-Vu remote management software. It enables a remote connection to the instrument, as well as providing the graphical user interface (GUI) for test setup and device management. The EX-Vu application 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 EX-Vu sessions can be supported via a standard Ethernet connection to the platform.

Automated Test Scripting

The RTU-310G supports .NET programming environment for users who prefer to build their automation test routines. The unit comes with a built-in macro-recorder, which allows users to easily record their test actions and automatically create test scripts; this also enables them to build standard test routines that can easily be accessed and run by technicians with little or no manual intervention. Scripts from the macro-recorder can be used as the basis for larger automation routines, which can be created or edited in any .NET environment.

Test Logger and Reporting

The RTU-310G supports a detailed test logger and test reporting tools, enabling users to view any errors/alarms that occurred during the test interval, which can then be used for post-processing of results or SLA conformance validation.

FUNCTIONAL SPECIFICATIONS

OPTICAL INTERFACES						
	10GBASE-SW	10GBASE-SR	10GBASE-LW	10GBASE-LR	10GBASE-EW	10GBASE-ER
Wavelength (nm)	850	850	1310	1310	1550	1550
	Multimode	Multimode	Singlemode	Singlemode	Singlemode	Singlemode
Tx level (802.3ae-compliant) (dBm)	-7.3 to -1	-7.3 to -1	-8.2 to 0.5	-8.2 to 0.5	-4.7 to 4	-4.7 to 4
Rx operating range (dBm)	-9.9 to -1	-9.9 to -1	-14.4 to 0.5	-14.4 to 0.5	-15.8 to -1	-15.8 to -1
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) (nm)	840 to 860	840 to 860	1260 to 1355	1260 to 1355	1530 to 1565	1530 to 1565
Measurement accuracy (uncertainty)						
optical power (dB)	±2	±2	±2	±2	±2	±2
frequency (ppm)	±4.6	±4.6	±4.6	±4.6	±4.6	±4.6
Maximum Rx before damage (dBm)	0	0	1.5	1.5	4	4
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 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
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
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	155.52 MHz
Output configuration	AC coupled	
Load impedance	50 ohms	
Maximum cable length (m)	3	
Connector type	SMA	

OPTICAL INTERFACES	
Optical interfaces	10 GigE LAN and 10 GigE WAN ^a
Available wavelengths (nm)	850, 1310 and 1550

Note

a. Available as a software option.

FUNCTIONAL SPECIFICATIONS (continued)

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

TESTING	
EtherSAM (Y.156sam)	Capability to perform the Service Configuration Test and Service Performance Test as per ITU-T Y.156sam. Tests can be performed to a 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 (bidirectional).
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 ten 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 (Q-in-Q)	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 analysis	Capability to analyze the incoming traffic and provide statistics according to a set of up to 10 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.
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 and 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 ^a	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 ^a	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 ^a	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 ^a	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 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.

Note

a. Available as a software option.

FUNCTIONAL SPECIFICATIONS (continued)

ADDITIONAL TEST AND MEASUREMENT FUNCTIONS

Power measurement	Supports optical power measurement, displayed in dBm.
Frequency measurement	Supports clock frequency measurements (i.e., received frequency and deviation of the input signal clock from nominal frequency). Frequency offset measurement Range (ppm) ± 120 Resolution (ppm) ± 1 Accuracy (uncertainty) (ppm) ± 4.6 Frequency offset generation Range (ppm) ± 150 Resolution (ppm) ± 1 Accuracy (uncertainty) (ppm) ± 4.6
Signal label control and monitoring	Ability to configure and monitor J0 trace, J1 trace and payload signal label C2 (WAN).
Dual test set	Performs end-to-end, bidirectional performance testing (as required by leading standards bodies)—remote Packet Blazer controlled via the LAN connection under test.
DHCP client	Capability to connect to a DHCP server to obtain its IP address and subnet mask to connect to the network.
Smart Loopback	Capability to return traffic to the local unit by swapping packet overhead up to layer 4 of the OSI stack.
IP tools	Capability 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. Embedded scripting routines provide a powerful means of creating advanced test scripts.
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 view; 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.
Screen capturing	Capability to gather a snap-shot of the screen for future use.
Logger printing	Capability to send logger messages to a supported local printer.
Remote control	Remote control through Ex-Vu or VNC.

MODULE SPECIFICATIONS

	RTU-310G-LAN	RTU-310G-WAN	RTU-310G-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

GENERAL SPECIFICATIONS

Communication interface	
LAN port	RJ-45 Rates: 10/100 Mbit/s
Craft port	RJ-45 Rates: 10/100 Mbit/s
Test interfaces	
Electrical	RJ-45 Rates: 10/100/1000 Mbit/s
Optical	XFP Rates: 10 Gbit/s LAN/WAN
Other interfaces	Four USB ports Serial port (RS-232 DB-9) and VGA port
Size (H x W x D)	1U rack-mount unit 44 mm x 427 mm x 330 mm (1 3/4 in x 16 13/16 in x 13 in) (19-inch and 23-inch rack-mount supported)
Weight	5.56 kg (12.3 lb)
Temperature	
operating	0 °C to 50 °C (32 °F to 122 °F)
storing	-40 °C to 60 °C (-40 °F to 140 °F)
Power	AC (110/220 V) DC (-48 V); dual DC power feed
Power consumption	70 W
Certifications	NEBS Level 1, CE, CSA, UL, WEEE and RoHS

ORDERING INFORMATION

RTU-310G-XX-XX-XX

Model

RTU-310G-LAN = IP Services Test Head – 10G LAN optical interface
 RTU-310G-WAN = IP Services Test Head – 10G WAN optical interface
 RTU-310G-LAN/WAN = IP Services Test Head – 10G LAN/WAN optical interface

Power Supply

AC = 100-240 VAC power supply
 DC = -48 VDC power supply

Other Software Options

00 = Without other options
 PBB-TE = Enable PBB-TE testing
 MPLS = Enable MPLS testing
 Adv_filtering = Enable advanced filtering capabilities
 IPv6 = Enable IPv6 testing
 EtherSAM = EtherSAM (Y.156sam) testing capabilities
 Data_Capture = Data capture and decode capabilities
 TRAFFIC-SCAN = VLAN/MPLS traffic scan

Example: RTU-310G-LAN-PBB-TE-AC

EXFO Corporate Headquarters > 400 Godin Avenue, Quebec City (Quebec) G1M 2K2 CANADA | Tel.: +1 418 683-0211 | Fax: +1 418 683-2170 | info@EXFO.com

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

EXFO America	3701 Plano Parkway, Suite 160 Plano, TX 75075 USA	Tel.: +1 800 663-3936	Fax: +1 972 836-0164
EXFO Asia	151 Chin Swee Road, #03-29 Manhattan House SINGAPORE 169876	Tel.: +65 6333 8241	Fax: +65 6333 8242
EXFO China	36 North, 3 rd Ring Road East, Dongcheng District Room 1207, Tower C, Global Trade Center Beijing 100013 P. R. CHINA	Tel.: + 86 10 5825 7755	Fax: +86 10 5825 7722
EXFO Europe	Omega Enterprise Park, Electron Way Chandlers Ford, Hampshire S053 4SE ENGLAND	Tel.: +44 2380 246810	Fax: +44 2380 246801
EXFO NetHawk	Elektronikkatie 2 FI-90590 Oulu, FINLAND	Tel.: +358 (0)403 010 300	Fax: +358 (0)8 564 5203
EXFO Service Assurance	270 Billerica Road Chelmsford, MA 01824 USA	Tel.: +1 978 367-5600	Fax: +1 978 367-5700

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

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.