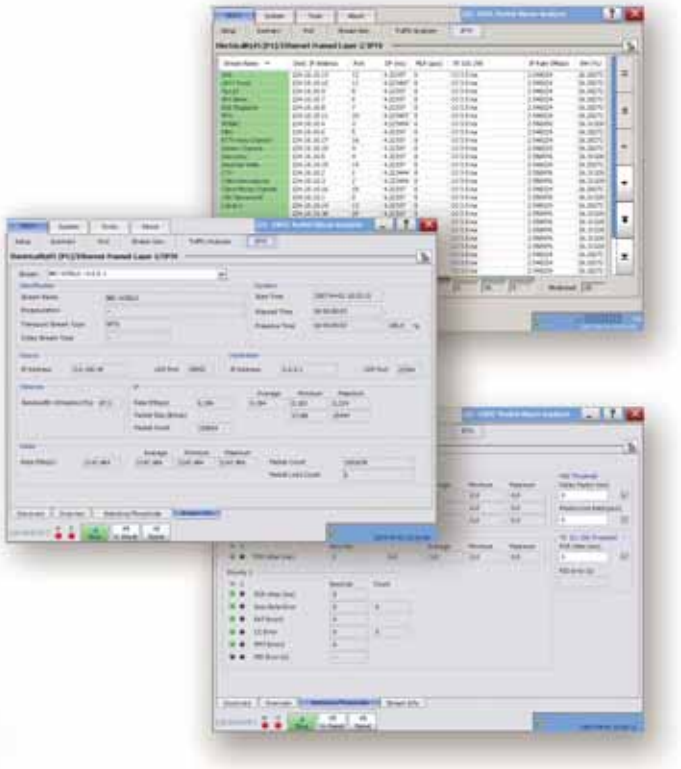
IPTV TEST OPTION

FTB/IQS-8510B
Packet Blazer Ethernet Test Module
IPTV Test Option

NETWORK TESTING—TRANSPORT AND DATACOM



Platform Compatibility

- *FTB-400 Universal Test System*
- *IQS-500 Intelligent Test System*

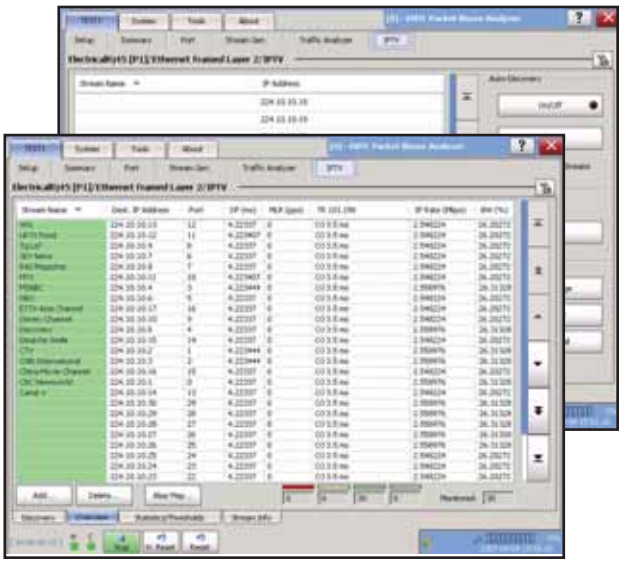
Powerful IPTV testing for service rollout, troubleshooting and monitoring applications

- Software option on the FTB-8510B and IQS-8510B Ethernet test modules
- Supports industry-standard media delivery index (MDI), as per RFC 4445
- Full Ethernet test capability and IPTV test metrics on a single platform
- Full range of test metrics on 100 simultaneous streams
- Supports industry standard TR 101 290 Priority 1 DVB metrics

Meeting the Challenge of IPTV Testing

Internet protocol television (IPTV) has brought telecom service providers to take a step from providing best-effort IP (Internet) services to guaranteeing the quality of service that is essential for IPTV services. IPTV is broadcasted over a complex IP architecture, therefore, any network impairment can affect the video and/or audio component of a digital TV program. Service providers are therefore taking a new look at how they roll out new higher-layer services in order to match both IP transport requirements and customers' expectations in terms of quality.

As an established expert in Ethernet and IP technology, EXFO is meeting the IPTV challenge by introducing a new IPTV test and monitoring software option for the FTB-8510B and IQS-8510B Packet Blazer™ Ethernet Test Modules. Along with the existing feature set that delivers performance assurance for Ethernet-based frame services, the IPTV suite of test applications offers all the measurements required for testing video quality and validating service-level agreements (SLAs) between service providers and their customers.



Sample IPTV graphical user interfaces

EXFO's new IPTV software options build on the current Packet Blazer Frame Analyzer engine, making it possible to troubleshoot an Ethernet circuit and analyze customer traffic for errors. The IPTV software option includes a full suite of measurement capabilities, such as RFC 4445 (MDI), TR 101 290 Priority 1 metrics, program clock reference jitter, stream rate, IP metrics and bandwidth utilization on up to 100 simultaneous MPEG-2, MPEG-4 Part 2 or ITU H.264 (MPEG-4 Part 10) unicast or multicast video streams. Additionally, configurable alarm thresholds are provided on selected metrics for customized testing applications. Important usability features include auto-discovery of all valid media streams and user-definable stream labels to allow for easy identification of the streams being monitored by associating the destination IP address to a user-readable stream name.

These combined features provide customers with the industry's most powerful portable test instrument and analysis tool for full transport-layer and service-layer testing. All metrics are clearly displayed through our simple-to-use Smart User Interface, which lets you tailor screen configurations, customize test routines and format reports on a real-time and historical performance basis.

KEY FEATURES

- 10 Mbits/s to 1 Gbits/s line rates
- Supports IPTV metrics for 100 media streams
- MPEG-2, MPEG-4 Part 2 and ITU H.264 (MPEG-4 Part 10) media stream support
- MPEG-2 transport stream as per ISO/IEC 13818-1
- MDI as per RFC 4445
- TR 101 290 Priority 1 metrics
- Auto-discovery of media streams
- Configurable alarm thresholds
- User definable stream labels (alias table)
- Encapsulation IPv4/UDP and IPv4/UDP/RTP
- Program clock reference (PCR) jitter measurements
- IP packet metrics
- Media rate
- Bandwidth utilization
- Presence measurements

WHY USE MDI?

MDI (RFC 4445) provides users with the tools to measure and diagnose most network induced impairments for IPTV streaming media. It is comprised of two distinct measurements: the delay factor (DF) and media loss rate (MLR).

As a measure of media stream delivery quality, MDI is typically sampled at multiple points throughout the stream path, with the measurements serving as indicators of network problems that can be addressed before they affect the end customer's service.

DF is the time difference between the arrival and the drain of the media packets. It takes into account the amount of jitter present in the media stream and provides a measure of the required buffer needed for error-free transmission at the next downstream point.

Large DF values indicate severe jitter in the network which in turn indicates that the network requires more latency (large buffers) in order to compensate for the time needed to fill the buffers before the packets can begin to be sent to the receiver.

MLR is the count of lost or out-of-order flow packets over a one-second sampling period. It is important to include out-of-order packets in the MLR metric, as many stream consumer-type devices do not reorder packets that are received out of order. Therefore, any lost or out-of-order packet will introduce errors and visible distortions to the media stream which may be perceptible to the end viewer. This fact makes the MLR component of MDI an often-used measure for service-level agreements.

IPTV Testing with the FTB/IQS-8510B

The FTB/IQS-8510B Packet Blazer module equipped with the IPTV option can be used at different points in the network to collect data and help isolate a fault affecting the IPTV service quality. See figure 1 below.

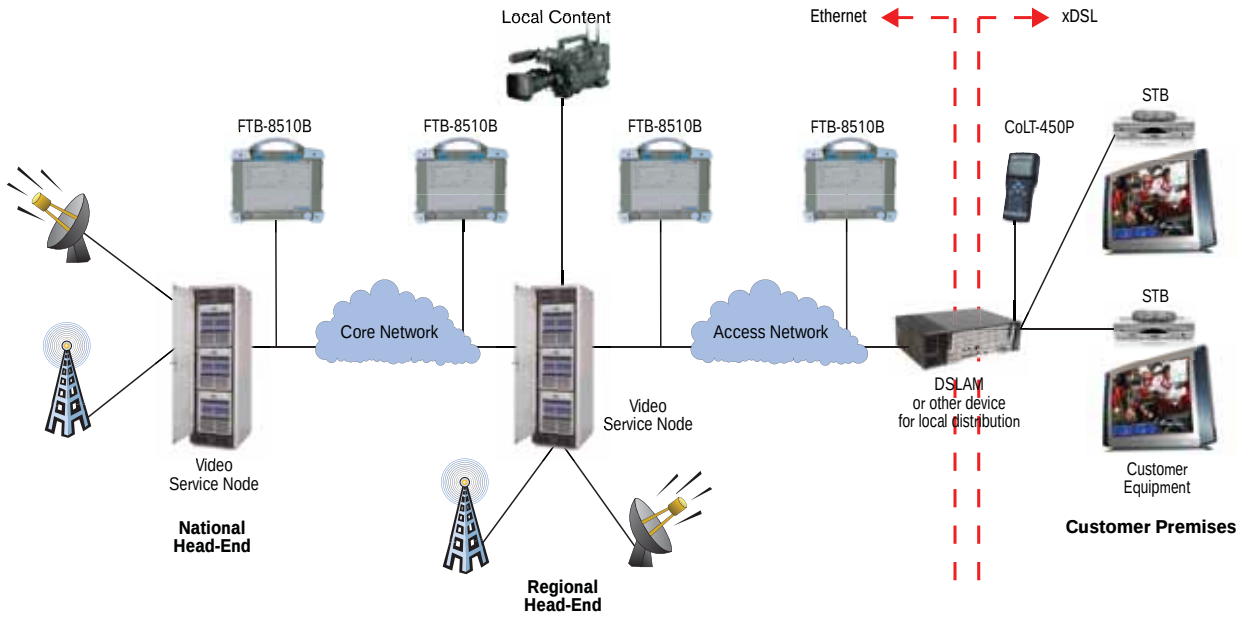


Figure 1. *IPTV testing can be performed at multiple points in the network where an electrical or optical Ethernet interface is available, typically through a test port.*

The IPTV network must be tested and characterized upon introduction of new services. In addition, it must be monitored constantly to limit unexpected service degradation. Figure 2 below presents a typical test configuration where the FTB/IQS-8510B can be used to monitor a specific section of the IPTV network. Test connections using a single- or dual-port test topology. Test connections can be established to monitor the IPTV streams at appropriate test points available from the core or access network devices (video streamers, routers, switches, etc.) using either electrical or optical Ethernet interfaces.

As seen in figure 2, the FTB-8510B modules enable the parallel monitoring of up to 100 unicast or multicast IP addresses to support IPTV monitoring (including VoD basic monitoring). The monitoring includes the ability to report statistics on MDI and PCR jitter in addition to other key statistics such as IP packet metrics, media rate, presence measurements and bandwidth utilization, which are necessary to correctly characterize an IPTV stream.

What's more, while monitoring the selected IP address in the IPTV network, all the functions supported via the Frame Analyzer application are also simultaneously available. This provides additional insight to troubleshoot IPTV issues that could originate from the Ethernet layer.

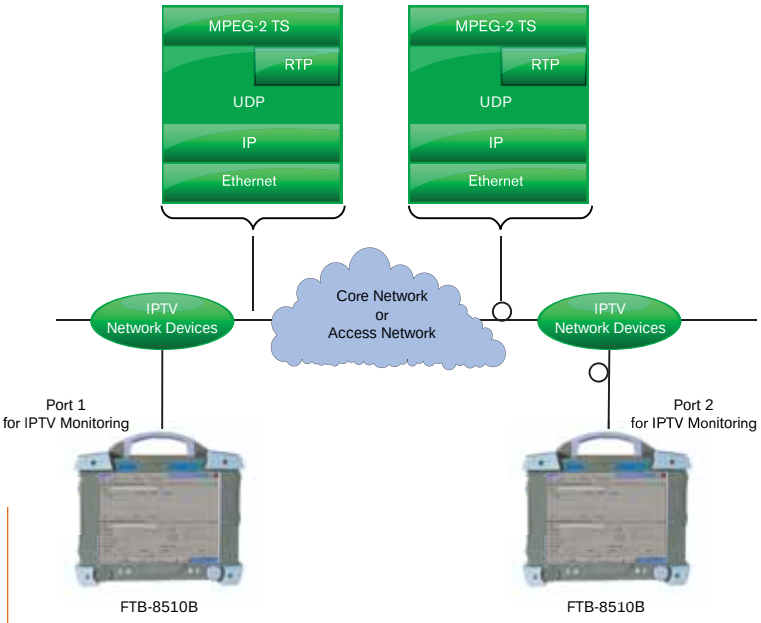


Figure 2. *A typical IPTV test setup using the FTB-400 and FTB-8510B combo.*

ORDERING INFORMATION

MODULE

FTB-85XX-XX

Model
FTB-8510B
FTB-8510B-1
FTB-8510B-2

Other options
00 = Without other options
100 optical = 100 Mbit/s optical capability on both ports
TCP = TCP throughput measurement
IPTV_MON = IPTV testing and analysis (10 streams)
IPTV_MaxStream = IPTV testing and analysis (100 streams)

Example: FTB-8510B-2-100 optical

For Gigabit Ethernet optical interfaces, FTB-859x Transceivers have to be ordered separately.

MODULE

IQS-85XX-XX

Model
IQS-8510B
IQS-8510B-1
IQS-8510B-2

Other options
00 = Without other options
100 optical = 100 Mbit/s optical capability on both ports
TCP = TCP throughput measurement
IPTV_MON = IPTV testing and analysis (10 streams)
IPTV_MaxStream = IPTV testing and analysis (100 streams)

Example: IQS-8510B-2-100 optical

For Gigabit Ethernet optical interfaces, IQS-859x Transceivers have to be ordered separately.

TRANSCEIVER

FTB-8590 = 1000Base-SX (850 nm) LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer
FTB-8591 = 1000Base-LX (1310 nm) LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer
FTB-8592 = 1000Base-ZX (1550 nm) LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer
FTB-85910 [a] = 100Base-FX (1310 nm) MM, LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer
FTB-85911 [a] = 100Base-LX (1310 nm) SM, LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer

Note

a. Available with 100 optical option.

SPECIFICATIONS

Interfaces	10 Mbit/s, 100 Mbit/s, 1 Gbit/s (electrical) 100 Mbit/s, 1 Gbit/s (optical)
Parallel monitoring capacity	100 streams
IPTV statistics	RFC 4445 media delivery index - Delay factor (current, average, min, max) - Media loss rate (current, average, min, max) - Virtual buffer size (current, average, min, max) ETSI TR 101 290 (Priority 1) - TS sync loss - Sync byte error - PAT error2 - Continuity counter error - PMT error2 - PID error PCR jitter (current, average, min, max)
Stream information	Stream name Source and destination IP address Source and destination UDP port number Transport stream type (SPTS) Encapsulation (IPv4/UDP or IPv4/UDP/RTP) MPEG-2, MPEG-4 Part 2 and ITU H.264 over MPEG-2 transport stream Start time Elapsed time Presence time
Stream statistics	Ethernet - Bandwidth utilization IP - IP rate - IP packet size - IP packet count Media - Media rate - Packet count - Packet loss

ADDITIONAL FEATURES

Stream auto-discovery
Stream auto-monitoring
Stream alias table
Configurable alarm thresholds
- MDI DF
- MDI MLR
- PCR jitter
- PID error

Find out more about EXFO's extensive line of high-performance portable instruments by visiting our website at www.EXFO.com.

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 Europe	Omega Enterprise Park, Electron Way	Chandlers Ford, Hampshire S053 4SE ENGLAND	Tel.: +44 2380 246810	Fax: +44 2380 246801
EXFO Asia	151 Chin Swee Road, #03-29 Manhattan House	SINGAPORE 169876	Tel.: +65 6333 8241	Fax: +65 6333 8242
EXFO China	No.88 Fuhua, First Road Central Tower, Room 801, Futian District	Shenzhen 518048, CHINA	Tel.: +86 (755) 8203 2300	Fax: +86 (755) 8203 2306
	Beijing New Century Hotel Office Tower, Room 1754-1755 No. 6 Southern Capital Gym Road	Beijing 100044 P. R. CHINA	Tel.: +86 (10) 6849 2738	Fax: +86 (10) 6849 2662

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