mTOP™ Rack and Probe Platforms

mTOP™ Rack Stacked with Multiple PacketExpert™ Devices

mTOP™ Probe - a Portable Stand-alone Solution

Wire Speed BERT on all Ports for Long Term Service Integrity Testing

Layer 1/2/3 + Ethernet Switch (and Router) Testing

Testing Multi-Protocol Label Switching (MPLS), Q-in-Q (Stacked VLAN) enabled Networks

End-to-end Testing of Network Paths for QoS Parameters

In-depth Troubleshooting of the Carrier Network in the Event of Network Failures or Impairments

QoS Testing of Triple-Play Services (Voice, Video, and Data)

RFC 2544 Benchmark Testing

Smart Loopback Mode for Single Ended Testing Scenarios

IP WAN Link & Devices Emulation between Two Local Networks

Automation and Remote Accessibility via Scripting

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PacketExpert™ (1G/10G) Ethernet/IP Tester (mTOP™ Rack and Probe Platforms)

PacketExpert™ 10GX mTOP™ Probe (Front view)

PacketExpert™ 10GX mTOP™ Probe (Rear View)

12-Port PacketExpert™ 10GX mTOP™ 1U Rackmount

24-Port PacketExpert™ 10GX Stacked 1U mTOP™ Rackmount

Overview

GL offers multi-interface test appliance in two variants - mTOP™ 1U/2U rack enclosure and mTOP™ Probe unit.

- The mTOP™ 1U/2U rack enclosure can be stacked with multiple PacketExpert™ USB units to provide high density GigE ports form factor solution for testing GigE switches, routers and network conditions.

- The mTOP™ Probe variant is an all-in-one self-contained test instrument, which includes single PacketExpert™ USB units along with necessary PC hardware in a single box. The comprehensive mTOP™ Probe is designed for easier portability and convenient for drive testing.

Both mTOP™ variants include additional USB 2.0 or 3.0 ports (with support for mouse/keyboard), 2 GB Ethernet ports, in-built PC with solid-state hard drive (up to 256 GB), standard 8 GB memory, and HDMI Interface (VGA), Windows® 10 64-bit OS. There are no moving parts with the unit, so reliability and longevity are integral.

Both the mTOP™ platforms includes PacketExpert™ 10GX (1G/10G) USB units. PacketExpert™ 10GX - capable of both 1Gbps and 10Gbps testing. It has two 10/1 Gbps Optical ports, and two 1 Gbps Electrical/Optical ports. The 10 Gbps Optical ports can be down-shifted to 1Gbps, thus allowing all 4 ports for 1 Gbps testing.

The PacketExpert™ 10GX hardware is more compact with reduced power requirements for high performance and adds 12-port user-configurable TTL trigger option as an important enhancement. BERT and Smart Loopback features are available on all (4 ports) 1 Gbps Electrical or Optical ports.

PacketExpert™ provides the important functionalities such as Wire speed BERT, RFC 2544 Testing, Smart Loopback, ExpertSAM, Record and Playback, PacketBroker, Multi Stream Traffic Generator and Analyzer, ExpertTCP and WAN IP link Emulation.

For detailed information on mTOP™ PacketExpert™, visit [https://www.gl.com/packetexpert-12-24-port-ethernet-tester.html](https://www.gl.com/packetexpert-12-24-port-ethernet-tester.html)

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Main Features

- High density Ethernet Ports with 12 (1G) or 6 (10G) ports on 1U mTOP™ rack. Stack multiple mTOP™ PacketExpert™ units to increase scalability of the solution and handle large number of ports.
- mTOP™ Probe unit for portability and convenient field testing
- Flexibility in running multiple interface tests from a single mTOP™ test unit
- Selective-Port and Smart Loopback
- Layer 1, Framed Ethernet (Layer 2), Stacked MPLS (Layer 2.5), IP (Layer 3), and UDP (Layer 4).
- User selectable Electrical and/or Optical interface allows mixed technology testing.
- Generate and capture Ethernet traffic on Electrical/Optical (up to 10/100/1000 Mbps) and Optical only (10 Gbps) interfaces
- All interfaces can run simultaneously and independently.
- With PXN101 licensing, the unit supports testing on 10G optical ports.
- Detailed frame statistics in tabular format for all the ports.
- Command line interface (CLI) support requires CXN100 licenses to access all the functionalities remotely using TCL, Python, C# clients and MAPS™ CLI Client/Server architecture.
- Real-time results are presented per port and all-port basis in both tabular as well as graphical formats.
- Consolidated detailed test result reports for all the ports on all the devices in PDF and CSV file formats.

Multi-Device Capability

<table>
<thead>
<tr>
<th>Applications</th>
<th>1U mTOP™ PacketExpert™ (12 ports)</th>
<th>1U Stacked mTOP™ PacketExpert™ (24 ports)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Port BERT (Ports 1G: #1, #2, #3, #4 in each Device) (Ports 10G: #1, #2 in each Device)</td>
<td>1G: 12 ports 10G: 6 ports</td>
<td>1G: 24 ports 10G: 12 ports</td>
</tr>
<tr>
<td>BERT/Loopback (1G: BERT on Ports #1 &amp; #3; Loopback on ports #2 &amp; #4 in each Device) (10G: BERT on Port#1; Loopback on Port#2)</td>
<td>1G: 6 ports Bert, 6 ports Loopback 10G: 3 ports Bert, 3 ports Loopback</td>
<td>12 ports Bert, 12 ports Loopback</td>
</tr>
<tr>
<td>RFC 2544 (1G/10G: Ports #1 &amp; #2 in each Device)</td>
<td>6 ports</td>
<td>12 ports</td>
</tr>
<tr>
<td>IPLinkSim™ (1G/10G: Ports #1 &amp; #2 in each Device)</td>
<td>6 ports</td>
<td>12 ports</td>
</tr>
<tr>
<td>IPNetSim™ (1G/10G: Ports #1, &amp; #2 in each Device)</td>
<td>6 ports</td>
<td>12 ports</td>
</tr>
<tr>
<td>ExpertSAM™ (1G/10G: Port #1 in each Device)</td>
<td>3 ports</td>
<td>6 ports</td>
</tr>
<tr>
<td>Record and Playback (1G/10G: Ports #1, #2 in each Device)</td>
<td>6 ports</td>
<td>12 ports</td>
</tr>
<tr>
<td>Record Only (1G/10G: Ports #1 &amp; #2 in each Device)</td>
<td>10G: 6 ports 1G: 12 ports</td>
<td>10G: 12 ports 1G: 24 ports</td>
</tr>
<tr>
<td>Playback Only (1G: Ports #1, &amp; #2 in each Device) (1G: Ports #1, #2, #3, #4 in each Device)</td>
<td>10G: 6 ports 1G: 12 ports</td>
<td>10G: 12 ports 1G: 24 ports</td>
</tr>
<tr>
<td>PacketBroker (Ports #1, #2, #3, #4 in each Device)</td>
<td>12 ports</td>
<td>24 ports</td>
</tr>
<tr>
<td>Multi Stream Traffic Generator and Analyzer (1G/10G: Port #1; Loopback on Port #2 in each Device)</td>
<td>3 ports MTGA, 3 ports Loopback</td>
<td>6 ports MTGA, 6 ports Loopback</td>
</tr>
</tbody>
</table>
Wire Speed BER Testing

Wire speed BERT measures Bit Error Rate on Layer1, Framed Ethernet (Layer2), MPLS (Layer2.5), IP and UDP layers. Supports various PRBS patterns such as $2^{9}-1$, $2^{11}-1$, $2^{15}-1$, $2^{20}-1$, $2^{23}-1$, $2^{29}-1$, and $2^{31}-1$ including constant patterns such as All Ones, All Zeros, Alternate Ones-Zeroses and user-defined test patterns ranging from 1 bit to 32 bits.

The screen below displays the supporting PacketExpert™ software, which can easily control multiple hardware units from a single GUI, multiplying the number of ports available per system.

Users can configure the 4 ports individually available on each of the devices. HD-PacketExpert™ (12 Ports) includes 3 devices configurations and HD-PacketExpert™ (24 Ports) includes 6 devices configurations.

RFC 2544 Testing

PacketExpert™ supports Throughput, Latency, Frame Loss and Back to Back tests as specified in RFC 2544. Similar to BERT, RFC 2544 can be done over Framed Ethernet (Layer2), Stacked VLAN (Q-in-Q), Stacked MPLS, IP or UDP.

RFC 2544 allows the test frame to be configured with Stacked VLAN and Stacked MPLS. This way, end to end RFC 2544 test can be conducted across a Carrier Ethernet/MPLS network.

Users can configure the 4 ports individually available on each of the devices. HD-PacketExpert™ (12 Ports) includes 3 devices configurations and HD-PacketExpert™ (24 Ports) includes 6 devices configurations.
Report Generation

HD-PacketExpert™ includes report generation option to generate consolidated CSV and PDF file format reports for all the 12 (1G)/6 (10G) ports. The following sample CSV and PDF reports generated for ‘All ports BERT’ test includes Interface, BERT Statistics, Tx/Rx Statistics, Tx Configuration, and Rx Configuration details for each of the 12 (1G) /6 (10G) ports.

Remote Control

PacketExpert™ supports Command Line Interface (CLI) requires additional CXN100 licensing to remotely access all functionalities such as All Port Bert, All Port Loopback, Bert Loopback, RFC 2544, IP WAN Emulator, Record Playback, ExpertSAM™, and PacketBroker using TCL, Python, C# clients MAPS™ CLI Server/Client architecture.
### Specifications of mTOP™ PacketExpert™ 10GX Rack

**1U mTOP™ Rack based 10GX Hardware Unit (with 12-Port TTL)**

**Stacked 1U mTOP™ Rack based 10GX Hardware Unit (6x PXN100s)**

#### Interface:

- **12 Total Ethernet ports (HD-PacketExpert-12)**
  - mTOP™ System (embedded SBC, 3x PXN100)
  - PacketExpert™ 10GX (PXN100) interfaces –
    - 6 x 1G Base-X Optical OR 10/100/1000 Base-T Electrical
    - 6 x 100 Mbps Base-FX Optical interface
    - 6 x 10G Base-SR, -LR -ER Optical only

- **24 Total Ethernet Ports (HD-PacketExpert-24)**
  - mTOP™ 1 System (embedded SBC, 3x PXN100)
  - mTOP™ 2 System (w/o SBC, 3x PXN100)
  - 12 x 1G Base-X Optical OR 10/100/1000 Base-T Electrical
  - 12 x 100 Mbps Base-FX Optical interface
  - 12 x 10G Base-SR, -LR -ER Optical only

#### Dimension:

- Length: 16 Inches
- Width: 19 Inches
- Height: 2x 1U mTOP™ (HD-PacketExpert-24) or 1U mTOP™ (HD-PacketExpert-12)

#### Power Source:

- ATX Power Supply

#### Connectivity:

- Intel Core i3 or optional i7 Equivalent, Windows® 10 64-bit Pro Operating System
- GigaBit Ethernet ports
- USB 2.0 or 3.0 ports, ATX Power Supply
- 240GB Hard drive, 8G Memory (Min)
- Two HDMI ports for display

#### Order Information:

- PXN100/PXE100
- MT001/MT001E (1U)
- MT001+MT002/ MT001E+MT002 (Stacked 1U)
### Specifications mTOP™ 10GX Probe

**PacketExpert™ 10GX mTOP™ Probe with 10GX Hardware Unit**

<table>
<thead>
<tr>
<th>Interfaces</th>
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</thead>
<tbody>
<tr>
<td>• 4x 1G Base-X Optical OR 10/100/1000 Base-T Electrical</td>
</tr>
<tr>
<td>• 2x 10G Base-SR, -LR, -ER Optical option</td>
</tr>
<tr>
<td>• 2 x 100 Mbps Base-FX optical interface</td>
</tr>
<tr>
<td>• Single Mode or Multi Mode Fiber SFP support with LC connector</td>
</tr>
<tr>
<td>• Optional 4-Port SMA Jack Trigger Board (TTL Input/Output)</td>
</tr>
<tr>
<td>• External USB based Wi-Fi adaptor (optional)</td>
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<tr>
<th>SBC Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intel NUC Core i3 or optional i7 Equivalent, Windows® 10 64-bit Pro Operating System</td>
</tr>
<tr>
<td>• USB 2.0 or 3.0 ports, 12V/3A Power Supply</td>
</tr>
<tr>
<td>• 256GB Hard drive, 8G Memory (Min)</td>
</tr>
<tr>
<td>• Two HDMI ports (Optional VGA to HDMI interface)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>External Dimensions</th>
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</thead>
<tbody>
<tr>
<td>• Length: 10.4 inches</td>
</tr>
<tr>
<td>• Height: 3 inches</td>
</tr>
<tr>
<td>• Width: 8.4 inches</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order information</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PXN100/PXE100</td>
</tr>
<tr>
<td>• MT005/MT005E</td>
</tr>
<tr>
<td>PacketExpert™ Options</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 volts, 3 Amps</td>
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</table>

### Buyer's Guide

- **PXN100** - PacketExpert™ 10GX
- **PXN101** - 10G option for PXN100
- **CXM100** - CLI Server for PXN100
- **PXN112** - PacketExpert™ 10GX – SA (12-Port)
- **PXN124** - PacketExpert™ 10GX – SA (24-Port)
- **MT001** - mTOP™ 1U Rack Mount Enclosure w/SBC (Intel i3 Core)
- **MT001E** - mTOP™ 1U Rack Mount Enclosure w/SBC (Intel i7 Core)
- **MT002** - mTOP™ 1U Rack Mount Enclosure w/o SBC
- **MT003** - mTOP™ 2U Rack Mount Enclosure w/SBC
- **MT004** - mTOP™ 2U Rack Mount Enclosure w/o SBC
- **MT005** - mTOP™ Probe with Intel i3 Core
- **MT005E** - mTOP™ Probe with Intel i7 Core

Refer [https://www.gl.com/packetexpert-high-density-12-24-port-ethernet-tester.html](https://www.gl.com/packetexpert-high-density-12-24-port-ethernet-tester.html) webpage.