

ETHERNET TEST SET  
**CMA5000 Gigabit Ethernet Module**



*Accelerating the Deployment of Ethernet Services*



The CMA5000 Gigabit Ethernet module features four full gigabit line rate ports – two GBIC ports and two RJ-45 electrical 10/100/1000 ports. Test basic networks with the T'Gen / Monitor application. The RFC-2544 application measures critical parameters during network installation, including throughput, latency, burstability and frame loss (as detailed in RFC 2544).

For in depth troubleshooting, the Channel Statistics option allows the user to quickly identify the root cause of network impairments, not

just the symptoms. Channel Statistics presents detailed statistics on all traffic received for up to 8,000 individual Ethernet or IP addresses, VLAN tags or MPLS labels. Full line rate traffic generation and shaping for 10/100/1000 BASE-T, 1000 BASE-SX, 1000 BASE-LX AND 1000 BASE-EX networks, combined with comprehensive professional reporting, ensures the easy installation, maintenance, troubleshooting and documentation of 10/100/1000 Mbps based Ethernet networks.

**Specifications**

Interface Specifications	Ethernet Test Ports	(2) Gigabit optical and (2) 10/100/1000 Mbps electrical
	Optical Line Interfaces	Simultaneously hold any two, field swappable, industry standard 850 nm (SX), 1310 nm (LX) and 1550 nm (LD, EX) GBICs
	Electrical Line Interfaces	10/100/1000 Mbps RJ45 (unshielded and shielded twisted pair cables, category 3, 4, 5, 5E, and 6) FDX and HDX operation
Traffic Generation	<ul style="list-style-type: none"> <li>• Variable line rate traffic generation, up to full line rate</li> <li>• Configurable IP and Ethernet source and destination addresses (Support of IPv4 and IPv6 addressing)</li> <li>• Unicast and broadcast frames</li> <li>• EtherType II (DIX V.2), IEEE 802.3 with 802.2 (LLC1) and IEEE 802.3 with SNAP encapsulation</li> <li>• Adjustable frame size from 44 bytes to 10,000 bytes provides testing of undersize, oversize, and jumbo frames</li> <li>• User definable VLAN ID and VLAN priority</li> <li>• Configurable data field (payload) supporting PRBS or user defined payload</li> <li>• User definable traffic mix (Broadcast and Unicast)</li> <li>• Frame sizes may be set to constant, stepped, or random length to emulate real world traffic profiles</li> <li>• In addition, when used with Ethernet or IP address swapping, all measurements may be performed in loopback or point-to-point networks allowing the CMA5000 to measure any network topology for unsurpassed versatility</li> </ul>	

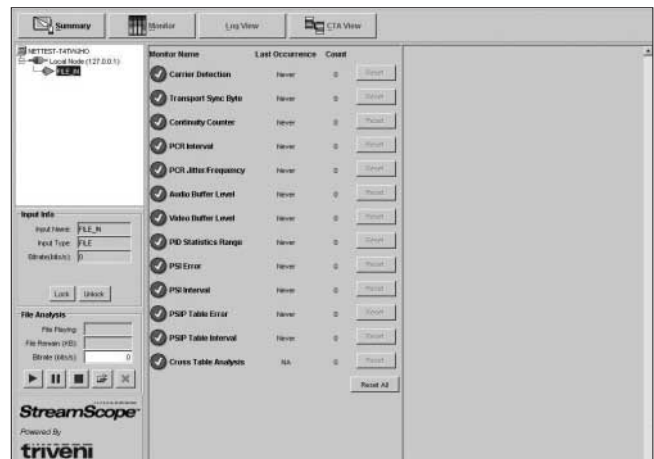
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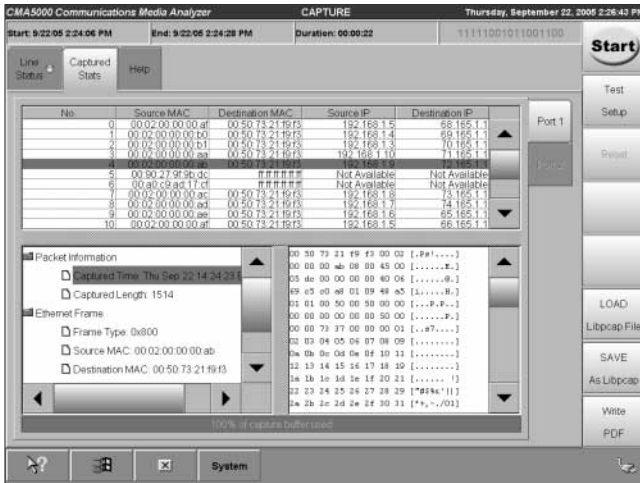
Ethernet Measurements (per port)	The CMA5000's comprehensive active (RFC 2544) and passive (monitoring and statistics) testing capability accelerate Ethernet service deployment and facilitate faster troubleshooting and maintenance.		
	Installation/Commissioning (RFC 2544)	<ul style="list-style-type: none"> <li>Throughput</li> <li>Frame loss</li> <li>Latency (timestamps or Pings)</li> </ul>	<ul style="list-style-type: none"> <li>Jitter</li> <li>Back-to-Back frames</li> </ul>
	Ping Test	<ul style="list-style-type: none"> <li>For efficient connection/configuration check and round trip time (RTT). Supports both IPv4 and IPv6 addressing.</li> </ul>	
	General Health/Line Statistics	<ul style="list-style-type: none"> <li>Link status</li> <li>Remote fault</li> <li>Signal present</li> <li>Frames present</li> <li>Speed</li> <li>Full or half duplex</li> </ul>	<ul style="list-style-type: none"> <li>Interface type</li> <li>Local clock</li> <li>Pause capable</li> <li>Asymmetric pause capable</li> <li>Link partner capabilities</li> </ul>
	Performance Statistics	<ul style="list-style-type: none"> <li>Max., min., average utilization</li> <li>Max., min., average throughput</li> </ul>	<ul style="list-style-type: none"> <li>Max., min., average frame rate</li> </ul>
	Frame Statistics	<ul style="list-style-type: none"> <li>Total frames</li> <li>Total good frames</li> <li>Unicast frames</li> <li>Multicast frames</li> <li>Broadcast frames</li> <li>Number of pause frames</li> <li>Total errored frames</li> <li>Number of fragments</li> </ul>	<ul style="list-style-type: none"> <li>Number of undersized frames</li> <li>Number of jabbers/oversize frames</li> <li>Number of FCS errored frames</li> <li>Number of collisions (10/100 Mbps half duplex only)</li> <li>Preamble violations</li> <li>Alignment errors</li> <li>IFG violations</li> </ul>
	Encapsulations (Frame Formats) Supported	<ul style="list-style-type: none"> <li>EtherType II (DIX v.2)</li> <li>IEEE 802.3 - LLC1</li> </ul>	<ul style="list-style-type: none"> <li>IEEE 802.3 - SNAP</li> </ul>
	Adjustable Thresholds	When any threshold is exceeded, the user receives a visual indication and the time and date are recorded in the events tag.	
		<ul style="list-style-type: none"> <li>Utilization</li> <li>Throughput</li> <li>Collision rate</li> <li>Unicast frames</li> <li>Multicast frames</li> <li>Broadcast frames</li> <li>Pause frames</li> <li>Errored frames</li> </ul>	<ul style="list-style-type: none"> <li>Fragment frames</li> <li>Undersized frames</li> <li>Oversize frames</li> <li>FCS errored frames</li> <li>IFG violations</li> <li>Preamble violations</li> <li>Alignment errors</li> </ul>
	Frame Distribution Statistics (Ethernet and IP)	<ul style="list-style-type: none"> <li>Total valid/good frames</li> <li>64 - 127 byte frames</li> <li>128 - 255 byte frames</li> <li>256 - 511 byte frames</li> </ul>	<ul style="list-style-type: none"> <li>512 - 1023 byte frames</li> <li>1024 - 1518 byte frames</li> <li>Total number of jumbo frames</li> <li>Max., min., average frame size</li> </ul>
Burst Statistics	<ul style="list-style-type: none"> <li>Total frames in bursts</li> </ul>	<ul style="list-style-type: none"> <li>Max., min., average burst size</li> </ul>	

## MPEG Analysis

The CMA5000 coupled with the 5700 Gigabit Ethernet module and optional MPEG transport stream analysis software can help troubleshoot your VoD system. The combination of the GigE module and this software allows for complete Ethernet testing and MPEG-2 transport stream analysis.

The importance of performing MPEG transport stream analysis is critical. An important measurement necessary within the MPEG layer is program clock reference PCR timing which results in PCR jitter. By providing a system that can examine the MPEG stream, any problems with the PCR jitter are uncovered.





Capture Ethernet frames from the network and decode for analysis.



Intuitive test results in both a tabular and graphical display.



Quick and automated RFC 2544 testing.

## Channel Statistics Option

90% of a network's life is spent installed, so troubleshooting and maintenance capabilities are critical. The Channel Statistics software upgrade for the CMA 5000 allows the user to quickly identify the root cause of network impairments, not just the symptoms. The Channel Statistics option presents detailed statistics on all traffic received for up to 8,000 individual Ethernet or IP addresses, VLAN tags or MPLS labels. These statistics allow immediate identification of the top talkers, top error generators or the most inefficient VLANs or users, in addition to many other parameters. The Channel Statistics option also includes a filtering capability that allows, problematic equipment, network links or VLANs to be targeted and isolated for analysis. Any or all of the following statistics may be presented on a per channel basis.

### Channel Statistics Optional Measurements

Statistics provided per IPv4, IPv6 or MAC address, VLAN ID or MPLS label.

- MAC source
- MAC destination
- VLAN ID
- Layer 2 protocol
- IP source
- IP destination
- IP type
- Protocol
- Source port
- Destination port
- Frame count
- Frame rate
- Throughput
- Byte count
- Errored frame count
- MPLS frames
- MPLS bytes
- Errored frame rate
- Errored throughput
- Errored byte count
- IP datagram bytes
- Ethernet frame size distribution
- IP packet size
- IP header bytes
- IP fragments
- TTL Violations
- IP header errors
- IPv4/IPv6 packets
- IPv4/IPv6 packet rates
- IPv4/IPv6 bytes
- IPv4/IPv6 throughput
- TCP bytes
- TCP packet count
- TCP packet rate
- TCP packet throughput
- TCP/UDP errored packets
- UDP bytes
- UDP packet count
- UDP packet rate
- UDP packet throughput

## Ordering Information

For the most current ordering information, please visit our website.