CMA5000

SPECIFICATIONS

5710 Gigabit Ethernet Module

General Description

The CMA5710 Gigabit Ethernet application is a single slot module that can be used in any CMA 5000. The Gigabit Ethernet test module enables testing of 10/100/1000 Mbps optical and electrical Ethernet networks. The module provides 2 optical (SFP) and 2 electrical (RJ45) ports. The module is specifically designed to facilitate installation and maintenance of Ethernet networks. For installation, the module provides RFC2544 test functions including: Throughput, Latency and Frame Loss tests. For maintenance and troubleshooting the module provides complete, non-intrusive monitoring capabilities and presents comprehensive statistics to give insight into the network's health and status.

Network Monitoring and troubleshooting

The CMA 5000 targeted application modes allow for quick and easy set up to ensure decreased downtime of the network under test. The auto-detect and auto negotiation capabilities takes the guess work out of connectivity and link status. User defined thresholds provide instant pass/fail notification of the network impairment. All test results can be displayed in both tabular and graphical forms which further expand the test results. In addition the pass through capabilities of the CMA5000 allow for non-intrusive network monitoring.

Installation and commissioning

In today's triple play networks proper installation testing and verification is essential to providing QoE to your customer. The industry standard RFC2544 is this method of ensuring proper network turn up and is required for deploying and commissioning high data rate networks. The CMA 5000 provides accurate results of throughput, frame loss, burst and latency to ensure the SLA performances that are demanded by the end user. The CMA 5000 not only performs these tests but automates the process through an Auto search function which decreases test time but still provides the accuracy that is needed. With the touch of a button all tests results can be generated into a comprehensive and professional report.

Key Features

- Small light weight single slot module
- Industry standard SFP optics
- Extended Battery operation
- Easy to use graphical user interface
- RFC 2544 Master/slave functionality to ensure ease of use
- IP jitter measurement for time sensitive applications such as IPTV and VOIP to ensure QoS
- Dual port provides non-intrusive monitoring of suspect link
- TCP and UDP encoding allows testing of the higher layer protocols
- Professional and comprehensive report generation at the touch of a button
- The channel statistics option allows you to identify all IP conversation pairs on the network with more than 40 statistics per channel
    - Top Talkers – identify which addresses are consuming the most bandwidth, helps identify, malicious users
    - Top Error Generators – identify which addresses are causing retransmissions
    - MAC / IP Addresses – identify all users on the link
    - VLAN tags / MPLS labels – filter and segment traffic per customer via VLAN tags

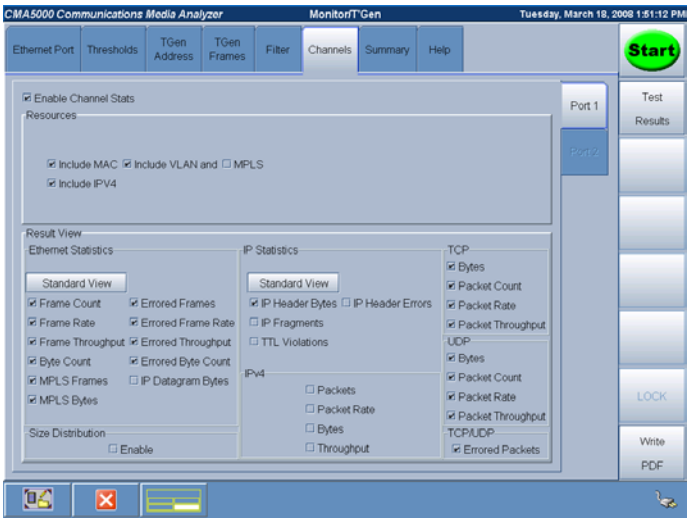

Fig.1 Channel statistics setup screen

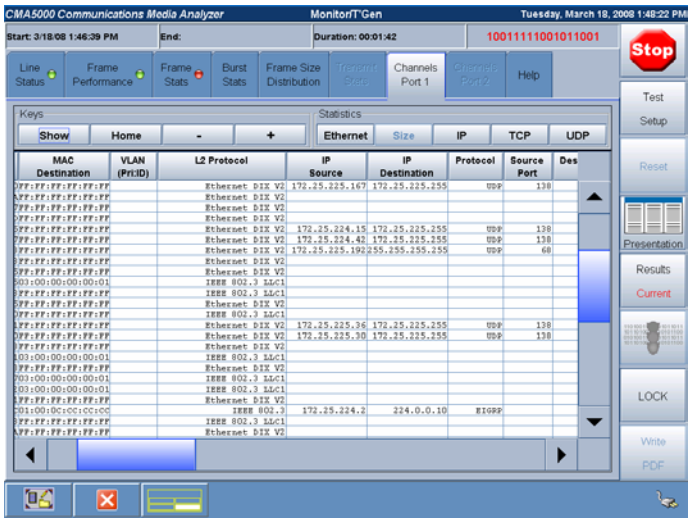

Fig.2 Channel statistics results screen

Standard Application Modes	

• **Monitor/ Traffic Generator**
  ○ Utilization (Constant Frame Rate and Frame Size)
  ○ Throughput
  ○ Errored frames
  ○ Frame size distribution
  ○ Total frames transmitted and received
• **RFC2544**
  ○ Throughput
  ○ Frame Loss
  ○ Latency
  ○ Back to Back frames (Burst)
  ○ IP Jitter
• **Ping**
  ○ Trace route
• **Reflector**
  ○ Reflect all
  ○ Reflect specific MAC address
  ○ Selective IP swap
	• **BERT**
	  ○ Framed and Unframed
	  ○ Sequence Test

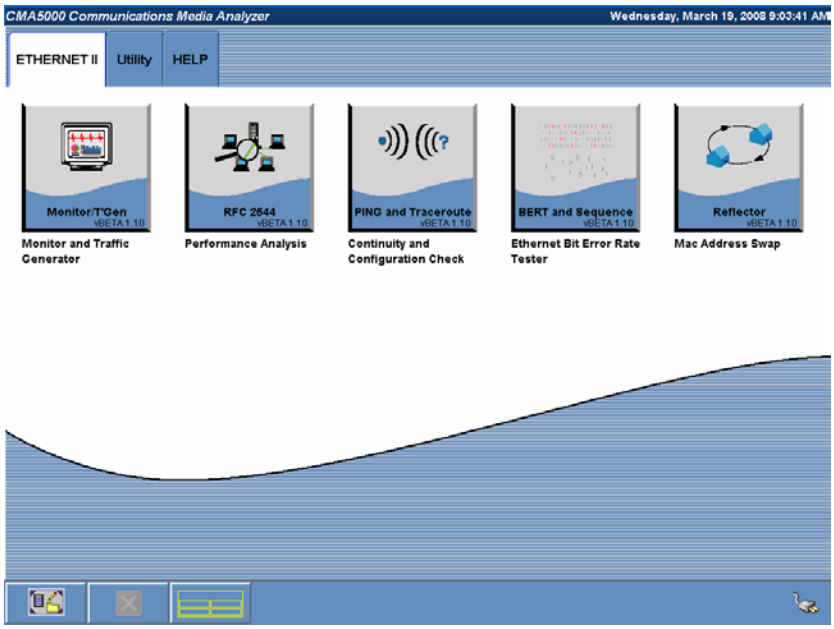

Fig.3 Targeted application modes provide the required tests for each test application

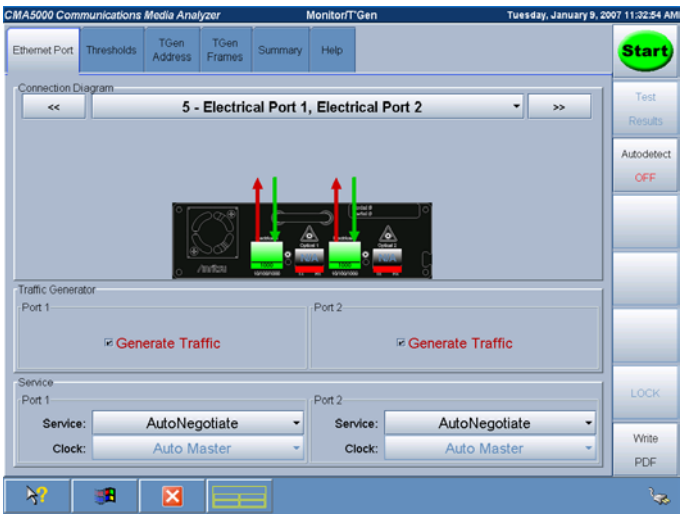

Fig.4 Intuitive graphical user interface provides unsurpassed ease of use

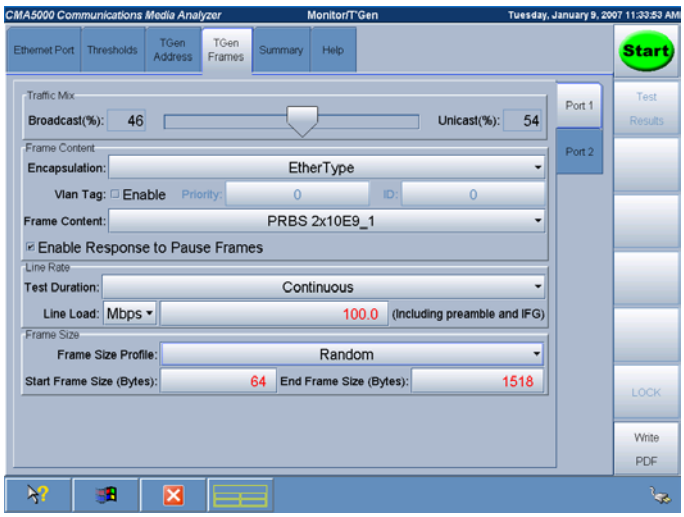

Fig.5 User defined traffic mix provides emulation of real world traffic

Fig. 6 Quick and automated RFC 2544 testing to ensure SLA performance

Fig.7 Intuitive test results in both a tabular and graphical display

Specifications

General	
Ports	• 2 electrical 10/100/1000M • 2 optical (SFP) ports 1000M or 100M (SFP's sold as separate line item)
Connectivity	• Auto negotiation User defined On or selective service • Auto detection User defined On or Off • Pass through mode in Monitor/Tgen application
Additional Support	• ARP Response • PING Response

Traffic Generation Application
• Variable line rate traffic generation, up to full line rate
• Configurable IP and Ethernet source and destination addresses (Support of IPv4 and IPv6 addressing)
• Configurable TCP and UDP source and destination ports
• Unicast and broadcast frames
• EtherType II (DIX V.2), IEEE 802.3 with 802.2 (LLC1) and IEEE 802.3 with SNAP encapsulation
• Adjustable frame size from 38 bytes to 10,000 bytes
• User definable VLAN ID and VLAN priority
• Configurable data field (payload) supporting PRBS or user defined payload
• User definable traffic mix (Broadcast and Unicast)
• Frame sizes may be set to constant, stepped, or random length to emulate real world traffic profiles.
• Transmit Statistics

Monitor Application	
General Health/Line Statistics	• Link status • Signal present • Frames present • Speed • Full or half duplex • Interface type • TX and RX optical power levels • Local clock • Pause capable • Asymmetric pause capable • Link partner capabilities
Performance Statistics	• Max., min., average utilization • Max., min., average throughput • Max., min., average frame rate

Monitor Application (cont'd)	
Frame Statistics	• Total frames • Unicast frames • Multicast frames • Broadcast frames • Number of pause frames • Number of VLAN tagged frames • Total errored frames • Number of fragment frames • Number of oversize frames • Number of undersized frames • Number of FCS errored frames • Number of collisions (10/100 Mbps half duplex only) • Preamble violations • Alignment errors • IFG violations
Frame Distribution Statistics	• Total valid/good frames • 64 - 127 byte frames • 128 - 255 byte frames • 256 - 511 byte frames • 512 - 1023 byte frames • 1024 - 1518 byte frames • Total number of jumbo frames • Max., min., average frame size
Burst Statistics	• Total frames in bursts • Max., min., average burst size
Transmit Statistics	• Compare transmitted and received Statistics • Current and cumulative
Thresholds	Simplified Pass/Fail evaluation of the test results by the following user defined thresholds: • Utilization • Throughput • Collision rate • Unicast, Mulitcast, Broadcast frames • Pause frames • Errored frames • Fragment frames • Undersized, oversized frames • FCS errored frames • IFG violations • Preamble violations • Alignment errors

RFC-2544 Application	
General	• Graphical display of “use cases” to choose from for ease of use • Support for Half duplex • Auto Search • User selectable “stop on No frame loss” • VLAN tag selectable • Predefined test configurations
Throughput and Frame Loss	• Frame profile: constant, stepped and user defined frames sizes including Jumbo frames. • User selectable step duration • User selectable frame content
Back to back frames (Burst)	• Frame profile: constant, stepped and user defined frames sizes including Jumbo frames. • Burst profile: constant, stepped • Step duration • User selectable number of repeats
Latency	• Frame profile: constant, stepped and user defined frames sizes including Jumbo frames. • User selectable step duration • User selectable number of repeats • Selectable “measure latency only at throughputs” • IP Jitter measurement
Report	• Printable PDF report • Results and settings • Tabular and graphical results • Custom logos can be generated on the PDF report. • A text version of the report may be generated, with CSV utilized for tabular results.

BERT Application	
BERT Patterns	• PRBS 2x10E9_1 • PRBS 2x10E11_1 • PRBS 2x10E15_1 • PRBS 2x10E20_1 • PRBS 2x10E20_2 • PRBS 2x10E23_1 • PRBS 2x10E29_1 • PRBS 2x10E31_1 • HF Test • CRPAT • JTPAT • SPAT
BERT Statistcs	• Errored Seconds • Severely errored seconds • Alarm seconds • Unavailable time • Available time • Error free seconds
Sequence Statistics	• Sequence errors • Sequence sync lost • Frame loss • Frame loss seconds

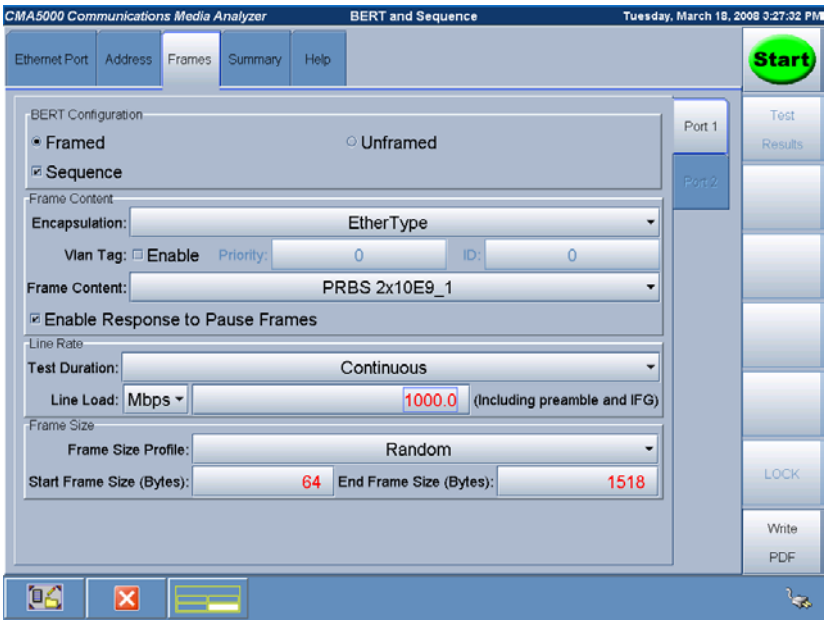

Fig.8 BERT application generates test patterns, either unframed or framed with IP header, and also detects sequence errors and loss of sequence synchronization.

Channel Statistics Option	
Statistics Displayed	• Frame count • Frame rate • Throughput • Byte count • MPLS frames • Jumbo frames • Errored frames • Errored frame rate • Errored throughput • Errored byte count • L2 header rate • Frame/packet size distribution • IP header bytes • IP fragments • IP length errors • TTL threshold violations • IP packets • IP packet rate • IP bytes • IP throughput • IP length errors • IP header errors • TCP/UDP bytes • TCP/UDP packet counts • TCP/UDP packet rate • TCP/UDP packet throughput • TCP/UDP errored packets
Filters	Filters available to be used in conjunction with the Channel Statistics Option to show only the required type of traffic of interest • IP or MAC source address • IP or MAC destination address • Encapsulation type • VLAN ID • VLAN tag priority • User defined pattern at a defined offset

Ordering Information	
5710-000-GIGE	Base Module
5710-085-GIGE	850 SFP
5710-013-GIGE	1310 SFP
5710-015-GIGE	1550 SFP
5710-CS-OPT	Channel statistics software option

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