CMA 5000

10 Gigabit Ethernet Application

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The compact size of the 10 Gigabit Ethernet application makes the CMA 5000 ideal for field installation and maintenance of Ethernet networks. In addition, when combined with the SONET/SDH analysis application, the CMA 5000 becomes the ultimate solution for metro network optimization.

Ideal Solution For Any Test Scenario

As a part of the CMA 5000 platform, the 10 Gigabit Ethernet application is just one other way to accelerate the deployment of services, while reducing the cost of measurement. With test and measurement options ranging from OTDR, connector inspection and dispersion to optical spectral analysis, bit error rate and SONET/SDH analysis, the CMA 5000 is the ideal single-solution for all your testing needs.

Testing 10 Gigabit Ethernet networks has never been more critical than it is today. Service providers and enterprise organizations require test equipment that is easy to use, can provide end-to-end circuit performance testing and reporting at the touch of a button. NetTest's CMA 5000 10 Gigabit Ethernet Tester is the first ever, field portable tester that provides both lab and field personnel with powerful testing capability all in one self-contained, rugged unit.

The CMA 5000 10 Gigabit Ethernet Tester easily enables network installation, commissioning and troubleshooting. The unit is a double size module with a one modular XFP port. The tester allows the user to simultaneously operate two modules in one CMA 5000. As a battery operated solution, the 10 Gigabit Ethernet tester can be easily moved between racks without the need to power down. Dedicated modes include: Ping (IPv4 and IPv6), Monitor and Traffic Generation, Performance Analysis (RFC2544), Reflector, BERT, Sequence Testing and Capture/Decode.

Accelerate Deployment of 10 Gigabit Ethernet Networks

The CMA 5000 platform and 10 Gigabit Ethernet Tester accelerates network deployment via:

- **Targeted applications to efficiently measure critical network parameters including throughput, latency, frame loss, connectivity and errored frame rate.**

- **Unsurpassed ease-of-use, allowing users to perform all relevant tests, including RFC 2544 by loading automated, preconfigured settings or defining all parameters individually. All user defined settings may then be stored and recalled for future testing.**

- **Professional, comprehensive reporting of all settings and test results in standard .pdf format at the press of a button.**

- **Valid, non-stressing traffic that characterizes and documents maximum, worst case and promised performance levels**

Decrease Troubleshooting Time and Cost and Increase Network Uptime

When your network is down, or service levels are compromised, delay is not an option. The CMA 5000 10 Gigabit Ethernet Tester quickly diagnoses service impairments and improves network uptime.

- **The Auto-negotiation and Auto-detect capabilities allow important network parameters such as connectivity, link activity, utilization, valid frame transmission and errored frames to be viewed immediately and automatically.**

- **To accelerate troubleshooting efforts, measurement results are displayed in both a detailed tabular (statistical) and intuitive graphical format.**

- **Thresholds may be set for all measurements to provide a quick, unmistakable, visual indication of pass/fail test status and the source of the failure.**

Easily and Efficiently Certify Links from End-to-End

When deploying 10 Gigabit Ethernet networks, it's critical to certify the link from end-to-end to ensure efficient turn-up and error free operation. The CMA 5000 provides targeted applications to facilitate fast, efficient link certification.

The Ping application quickly and easily verifies connectivity and configuration. The Traffic Generation application provides end-to-end testing by having one CMA 5000 generate Ethernet traffic, up to full line rate, while a receiving network station or second CMA 5000 monitors the traffic at the far end of the link under test. With the CMA 5000 10 Gigabit Ethernet tester, you have complete control of the line load, frame size, frame rate, frame contents and VLAN tag. In addition to the ability to insert one or multiple errors, links can be easily characterized under real world, full line rate conditions. By using the CMA 5000's Monitor with Traffic Generation application, one unit can be used to both generate and receive Ethernet traffic. In this manner, all traffic sent and received can be simultaneously viewed on one display. The network under test can either provide the logical loopback or a remote CMA 5000 can be used to swap the Ethernet and IP source and destination addresses to provide the loopback.

RFC 2544

The data communications industry's RFC 2544 Benchmarking Methodology for Network Interconnect Devices, details the testing requirements for deploying and commissioning high data rate networks. The CMA 5000 10 Gigabit Ethernet Tester performs Throughput, Latency and Utilization (Constant Frame and Frame Size) tests, in compliance with RFC 2544. The CMA 5000 not only performs these tests, but also automates the process by offering predefined, loadable configuration files to perform the tests in complete conformance testing.
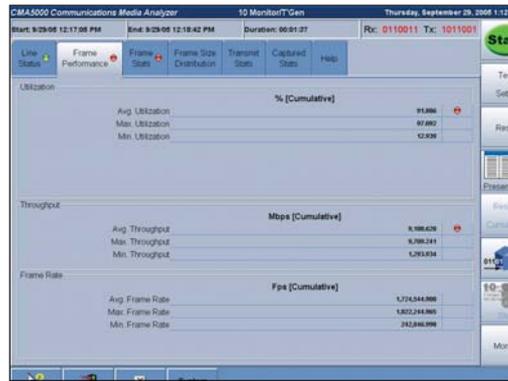
Capture and Decode

This feature will allow users of the CMA 5000 10GigE module to capture Ethernet frames from the network and decode and view them in a traditional "3-pane type" display. The user is then able to see the hexadecimal representation of each frame captured. In addition the user is able to filter the traffic so that only certain frames are captured and triggers are definable so that the capture can be started at the correct time. This feature provides ultimate detail for advanced troubleshooting.

- **Variable line rate, up to full line rate**

- **Configurable Ethernet source and destination addresses**

- **Configurable IPv4 and IPv6 source and destination address, netmask and gateway**

- **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**

- **User defined frame or frame segment**

- **Configurable number of frames, single, multiple or continuous generation**

Coupling the CMA 5000's touchscreen interface with intuitive configuration controls ensures efficient, accurate setup to minimize test time and accelerate service deployment.

With the press of a single button, important network parameters such as link status and utilization may be obtained. In addition, unmistakable alarm notification will signal compromised network performance when service degrades below any one of 15 preset, user-defined thresholds.
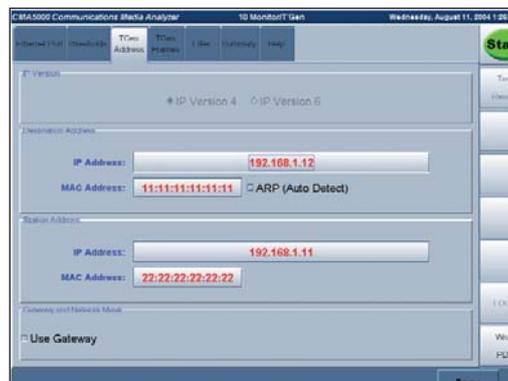
Complete control over IP and Ethernet addressing allow the CMA 5000 10 Gigabit Ethernet application to emulate network elements for comprehensive testing and troubleshooting.

Traffic Generation

The CMA 5000 10 Gigabit Ethernet Tester's traffic generation capabilities include:

- Variable line rate traffic generation, up to full line rate

- Multiple traffic stream generation

- Configurable IP and Ethernet source and destination addresses (Support of IPv4 and IPv6 addressing)

- 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 64 bytes to 9,600 bytes provides testing of undersize, oversize and jumbo frames

- 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

- In addition, when used with Ethernet or IP address swapping, all measurements may be performed in loopback or point-to-point networks allowing the CMA 5000 to measure any network topology for unsurpassed versatility

Performance Analysis

Installation/Commissioning

- Througput
- Frame Loss
- Latency
- Burst
- •BERT
- Sequence Test

Ping Test

- To quickly verify continuity and connectivity to network elements, the CMA5000 10 Gigabit Ethernet module provides a Ping Application. Supports both IPv4 and IPv6 addressing

General Health/Line Statistics

- Link status
- Remote fault
- Signal present
- Frames present
- 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

Frame Statistics

- Total frames
- Total good frames
- Unicast frames
- Multicast frames
- Broadcast frames
- Number of pause frames
- Total errored frames
- Number of fragments
- Number of undersized frames
- Number of jabbers/oversize frames
- Number of FCS errored frames

Encapsulations (Frame Formats) Supported

- EtherType II (DIX v.2)
- IEEE 802.3 - LLC1
- IEEE 802.3 - SNAP

Performance Analysis Continued

Adjustable Thresholds

When any threshold is exceeded, the user receives a visual indication and the time and date are recorded in the events tag.

- Utilization
- Throughput
- Unicast frames
- Multicast frames

- Broadcast frames
- Pause frames
- Errored frames
- Fragment frames

- Undersized frames
- Oversized frames
- FCS errored frames

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

Models available include

Model Numbers	Application
5800-000-10GIGE	CMA 5000 10GigE Base Module
5800-085-XFP	850nm XFP
5800-013-XFP	1310nm XFP
5800-015-XFP	1550nm XFP
5800-SW1-OPT	Software Option - BERT
5800-SW2-OPT	Software Option - Capture and Decode
5800-SW3-OPT	Software Option - sequence testing.
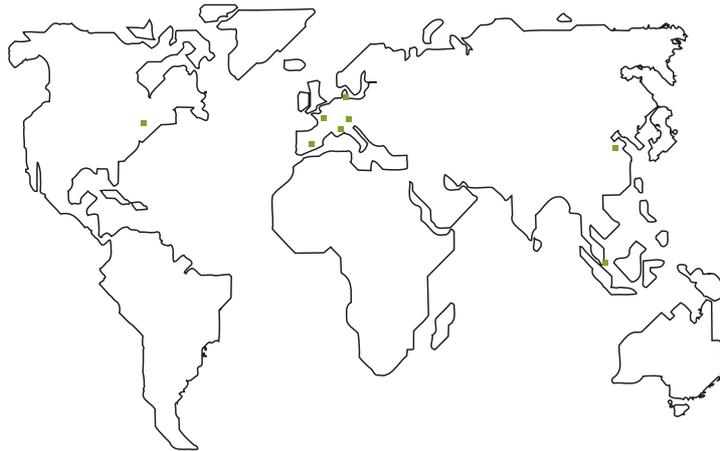
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