CN-100 Network Analyzer

Product Overview

CN-100 network analyzers offer an extremely powerful yet cost effective solution for today's complex networking requirements. Test Ethernet or ATM networks with the multi-port CN-100 portable or rack mount chassis which provide a standard platform that is easy to use, reducing training time and the expense of multiple testers. The CN-100's performance and scalability offers the latest traffic generation and analyzing capabilities that support a variety of protocols and media to meet your needs for today and tomorrow.

10 Gigabit Ethernet LAN/WAN Interface Module

10/100/1000 Mbps Dual Media Interface Module

10G Ethernet Module
Number of Ports: 2 per Interface Module
2-Slots supporting 4 ports of 10 Gigabit Ethernet
Interface: 10 Gigabit XFP

10/100/1000 Mbps Ethernet Module
Number of Ports: 4 per Interface Module
2-Slots supporting 8 ports of Gigabit Ethernet
Interface: Gigabit Ethernet SFP or RJ45

Key Features

➢ Up to 4096(10GE) and 256(1GE) unique streams generate per Port, Millions of unique flows per stream
➢ Up to 65536(10GE) and 8192(1GE) streams tracked and analyzed for latency, inter-arrival time, packet loss, data integrity, and sequence checking
➢ Real-time RX flow base statistics display with latency, jitter, rate, bandwidth and packet loss per each stream
➢ Flow base statistics report can be generated by user defined time period and iterations
➢ Framed Bit Error Rate Testing for layer 2,3, 4, IPv4,IPv6, TCP,UDP
➢ 32 MByte Real-Time full line rate capture buffer with decoder, captured data can be replay
➢ RFC 2544 and RFC 2889 with graphic results and test logs
➢ Support Multi-Level VLAN (Q-in-Q) and MPLS
➢ Multi-users per port: 8 individual users can access CN100 GE tester at same time when CN100 is fully populated
➢ Through Mode with Impairment
➢ Auto QoS test with user defined time and iterations with user friendly test reports
➢ True layer 4 TCP stack simulation
➢ SIP signaling simulation for QoS test of VoIP and IPTV
➢ Remote loop back for remote locations loop back testing
➢ Ethernet and ATM Internetworking with real-time QoS test
➢ C and Tcl library allows users to develop custom scripts and integrate the modules into automated test environments
➢ Hardware and firmware are field programmable

Traffic Generation

Full Line Rate traffic generation capabilities include generation of Ethernet frames with various configurable parameters such as bandwidth utilization, frame rate, frame payload and frame length to simulate different network traffic conditions and analyze the performance of the link.
➢ Up to 4096 unique streams on a 10GE port, 256 unique streams on a 1GE port
➢ Stream-based, wire-rate traffic generation at all frame sizes with timestamps, sequence numbers and data integrity signatures

- Stream length from 40 bytes to 16K bytes
- Payload Patterns: Fixed, incrementing, decrementing, and random values, user defined payload date
- User Defined Field (UDF): Fixed, increment or decrement by user-defined step, value lists, range lists, cascade, random, and chained
- Supports 802.1p, 802.1q, and 802.3ac VLAN tagged frames
- Ports are completely independent in operation
- Unicast, broadcast, and multicast traffic supported
- Protocol type: ICMP, IGMP, ARP, RARP, VLAN Tagged frames, TCP, UDP, MPLS, IPv4, IPv6, IPv6-TCP, IPv6-UDP

Real-Time RX Flow Base Monitoring and Analysis

Comprehensive user-definable filters and triggers provide real-time traffic analysis with link and frame statistics:

- Real-Time analyzes up to 64 RX flows regardless of the source
- Real-Time display for each flow with TX/RX packets and bytes, rate, bandwidth, min, max and average latency, packet jitter and real-time packet loss
- Flow filters can be IP, MAC, VLAN tag, MPLS label, Dffser/TOS, CN Stream ID, TCP port and UDP port
- Real-Time graphic display per stream
- Test results can be saved to reports in user defined period and iterations

LAN QoS Tests

LAN QoS tests performed using the Compass Data Integrity Signature, QoS histograms based on stream tracking or overtime buckets are available displaying packet loss, sequence tracking, utilization, and latency per stream.

- Up to 65535 stream per 10GE port and 8192 streams per 1GE port analyzed in real-time
- Streams ID, stream source, TX/RX packet count, packet lost per stream
- Latency average, minimum, maximum and distributions per stream
- Sequence tracking, in sequence count, out of sequence errors
- Measurable packet jitter for average jitter, maximum jitter and last latency
- User definable for manual or auto test, the results can be saved as report

Bit Error Rate Testing

Framed BERT testing check the received packet bit by bit to ensure packet data integrity

- Multi-streams and multi-destination address Layer 2, 3 and 4 in frame BERT testing on each port. TX generator and RX checker support PRBS-15,19,23 and fixed patterns
- The test results report bit error rate, dynamic bit error ratio, and static bit error ratio
- Insert Single Bit Errors or a constant error rate 10E-3 or 10E-6
- TX and RX elapse timer can be set for BERT testing period

Full Rate/Real Time Capture

32M Bytes real-time full line rate capture with an extensive set of triggers and filters is available for capturing based on source and/or destination MAC and/or IP addresses, Traffic Type and error conditions.

➢ Captured data can be play back with rate reconfiguration
➢ Capture mode: capture with first matched frame at beginning, end, or at user defined location, capture all received frames or capture filtered frames
➢ Perform simple decode or export data to a protocol decoder which is available separately
➢ Up to 32 events with any/and/or combinations can be used to define capture filter criteria

Through Mode with Impairment

➢ Packet pass or drop
➢ Packet delay or Packet jitter
➢ Replace/Invert packet data
➢ Swap MAC/IP address
➢ Inject error

True Layer 4 TCP Stack Emulator

➢ Support full TCP stack simulation
➢ Support sliding window flow control
➢ Hardware based implementation support full line rate
➢ Up to 8 independent connections between servers and clients
➢ Useful for TCP benchmark measurement

SIP Signaling Emulator

➢ Emulates Telephony, IPTV, Video On Demand and Internet traffic
➢ Simulate SIP endpoints
➢ Maintains full control over SIP state machines messages and contents

RFC2544 and RFC2889 Test

RFC2544 provide Throughput, Frame loss, Back-to-Back, Latency performance test for layer 2 and layer 3. Graphic test results and test log files provided.

RFC2889 provides fully meshed traffic performance test for Forwarding, Congestion control, address caching capability, address learning rate and error frame filtering. Graphic test results and test log files provided

Routing Protocols Generator

➢ Routing Information Protocol Packets
➢ Open Shortest Path First Protocol Packets

Ethernet and ATM Internetworking QoS Tests

➢ Real time internet transmit and analysis
➢ CN100 ATM and Ethernet QoS test performed using Compass Data Integrity Signature

- ➢ TX and RX frame counters
- ➢ Bandwidth utilization & rate
- ➢ Latency measurement (Max, Min, Mean)

Optical transceiver types: 10G Ethernet XFP MSA, 1G Ethernet SFP MSA
Laser Wavelengths: 850nm, 1310nm, 1550nm
Optical cabling: Multi-mode, single mode fiber
10GbE IEEE 803.3ae protocol modes: Serial LAN, WAN
10GbE Signal rate: 10.31256Gbps LAN, 9.58464Gbps WAN

ATM Interface Modules

The ATM interface modules allow full line rate generation, monitoring and capture across each individual port. Dual port ATM interfaces are available for OC-12/OC-3 (software selectable), DS3, and E3 rates. The multi-rate cards provide a high-density, yet cost effective solution for your ATM testing requirements

Traffic Generation

Traffic generation capabilities allow users to define the complete VC. The data can be specified using the ATM Adaptation Layers (AALs) and the OAM cell. Set payload content with user-defined data over the entire header and payload.

- ➢ 1024 full-duplex traffics streams can be generated and monitored per port
- ➢ Define traffic type: AAL5, Raw cell, Test cell (O.191), OAM cell and BERT cell
- ➢ 1024 Virtual connections can encapsulate protocols such as: TCP/IP, PPP ILMI, LANE, PPPoE, PPPoA, MPLS
- ➢ Define header and payload, predefined payload patterns or user defined cells and PDUs including programmable embedded words in any position
- ➢ IP Over ATM and IP Ping testing
- ➢ 1024 streams have independent traffic shaping: Constant Bit Rate (CBR), Variable Bit Rate (VBR), Unspecified Bit Rate (UBR) service categories. Definable Sustained Cell Rate (SCR), Peak Cell Rate (PCR), Maximum Burst Size (MBS), Cell delay Variation Tolerance (CDVT).

Monitoring and Analysis

Real-time traffic monitoring is made easy with comprehensive filters and triggers. Using graphical histograms and charts users can perform easy analysis of real-time traffic.

- ➢ Full rate traffic monitor: 1024 Virtual Connections monitored simultaneously including TX, RX, error counters
- ➢ Each port accumulates statistics in real time, including the count and rate of cells and frames sent and received
- ➢ Auto-Scan of all active network VPI/VCI up to 16 million
- ➢ Bandwidth Utilization, rate/peak rate, Cells/bits per second

➤ Extensive Filter and Trigger Capabilities: 32 Header Filters, 2 Payload Filters: Header Bit mask/48 Byte payload mask

Physical Layer Testing

Detect and inject Physical and ATM layer alarms and errors including framing and cell delineation testing. Monitor PHY status for alarm and error counters on each port including HEC Correctable and uncorrectable counts, Section LOS, Section LOF, Section BIP (B1), Line AIS, Line RDI, Line REI (FEBE), Line BIP (B2), Path AIS, Path RDI, Path REI (FEBE), Path BIP (B3), Path LOP.

BERT-Bit Error Rate Testing

BERT testing to verify transmission line quality Perform Bit error rate testing on each port to verify transmission line quality. BERT-Bit Error Rate Test patterns: Predefined PRBS 15, 20, 23 All ones, All zeros. Inject Single Bit Errors or inject a constant error rate 10-3 or 10-6.

Quality of Service Testing (ITU-T O.191)

Quality of Service testing provides accurate performance measurements on each port. Perform 1-point or 2-point QoS including lost cells, mis-inserted cells, cell transport delay and cell delay variation. Graphical histograms and charts provide easy to read accurate measurements of cell loss, cell delay and error rate.

Real-Time Capture

Full-rate capture can be performed on each of the individual ports. An extensive set of triggers and filters is available for capturing based on header or payload, cell type, data pattern, error conditions and other user definable fields. Turn on or off any variety of Pre- and/or Post-Capture filters/triggers to perform specialized captures to isolate data.

Operation, Administration and Maintenance (OAM)

Perform OAM tests and Insert OAM cells on live traffic with our programmable OAM cells. OAM cells used for alarm surveillance, performance monitoring and troubleshooting. Programmable OAM cell insertion of F4/F5 End-to-end, Loopback, segment management, AIS, RDI, Continuity Check, activation/deactivation, loopback test. OAM cell capture, decode and perform CRC 10 check.

CN-100 MANAGER SOFTWARE

The CN-100 Manager software tool allows multiple users to be connected to one chassis and control the CN-100 locally or remotely via a 10/100 Ethernet LAN. The CN-100 Manager can be used to load redefined tests or user-defined tests with full access to traffic generation, monitoring, QoS statistics and histograms, and full-line rate capture. Save test results with detailed trending and report generation.