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SMARTBITS

& SMARTCARDS

SMARTBITS: Advanced Multiport Performance Tester/ Simulator/Analyzer

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SmartBits performs all these tests with the highest performance and accuracy available today, making it the finest engineering tool available in the industry.

Production Testing:

SmartBits is a "ready to use solution" for manufacturing and testing of simple to very complex network products from 1 to 80 ports. With SmartApplications, you can modify test parameters to fit your existing test program, so you can reliably start testing your product with an industry standard tool almost immediately. With SmartLib, the Programming Library for the ET-1000 and the SmartCards, you can create new applications or modify the one provided in SmartApplications, using Visual Basic or C/C++ languages, for MS-DOS, Windows, or UNIX to fully customize your applications.

SmartBits Unique Features:

Provision for Multiple LAN Technologies:
Ethernet, Fast Ethernet, and Token Ring are currently supported. Future technologies can include 100VG, ATM and router support.

Unique and Original Hardware:
SmartBits is a unique and original test platform using customized network controllers designed to test and monitor internetworking equipment, devices or networks at maximum performance.

Up to 80 Modular Ports of Unsurpassed Performance Accuracy and Ease of Use:
Each of the 80 independent ports can transmit and receive at maximum speed giving SmartBits the capability of generating and monitoring 1.2 million packets per second for Ethernet using legal size packet lengths and gaps.

Easy to Use Windows User Interface:
SmartWindows, the MS Windows SmartBits user interface, provides a very intuitive and easy to use interface to generate and monitor custom traffic and errors. Each SmartCard can be setup individually or in a group for coordinated transmissions.

SmartBits is easy to Program and Customize:
SmartBits can be easily programmed with SmartLib, with Visual Basic or C/C++ using Borland or Microsoft

Latency Measurements Between Cards with 100 Nanosecond Resolution!

Multiple Transmission Modes:
Each SmartCard can independently transmit its own packets, continuously, in single step, collision, burst, or echo a packet in response to matching trigger conditions.

Fine adjustment of traffic generation:
SmartBits permits control of traffic generation over a wide range. Packet length is adjustable from 1 byte to 8191 bytes in 1 byte increments. Interpacket gap is adjustable from 1 microsecond to 1.6 seconds in 100 nanosecond increments. Packet length and interpacket gap can be set to vary randomly within user defined limits.

Dynamic Gap and Packet Length Control:
Gap and packet length can be adjusted dynamically while the test is still running in any card or group of cards within the SmartBits chassis.

3 Variable Fields for Custom Packet Generation:
Each SmartCard permits the user to completely define the contents of outgoing packets with any fixed or customized data pattern. Additionally each card provides 3 Variable Fields of Data (VFDs) with user defined length. These fields can be located anywhere in the packet, their variation can be sequential, random or from user defined sequences. The 3 VFDs permit stress testing of addresses and protocols in switches, bridges, or routers with interpacket gaps down to 1 microsecond.

Accurate Monitoring of Rate and Counts of all Network Statistics:
Each card offers 9 rate and event counters to monitor cumulative count or rate of transmitted packets, received packets, collisions, CRC errors, alignment errors, undersize and oversized packets, and triggers match combinations. Each set of counters can be monitored for each card individually or in groups.

Selective Data Capture and Analysis:
Using EtherWindows, the Ethernet SmartCard can be selected to have its input analyzed via a common one megabyte capture buffer. You can capture any packet or a selected portion of packets that meets a criteria, such as trigger conditions or errors.

Serial Triggers:
SmartBits offers two 48 bit serial triggers for each card. Each trigger can be defined on a bit by bit basis. The position of each trigger can be specified anywhere in the packet, including the CRC field. Serial triggers can be used to qualify capture, for timing measurements, for collecting statistics, or to start transmission in a SmartCard set in echo mode.

Easy Maintenance and Upgrades:
Available via FTP or a bulletin board system, 24 hours a day 7 days a week, for firmware, software or reprogrammable

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Windows environment.
SmartLib is also available for the
UNIX environment.

SMARTBITS HARDWARE:

**SmartBits Chassis comes in two configurations:
the SMB-1000 and the SMB-10. Each Chassis can hold up to 20 SmartCards.**

The SMB-1000 includes an integrated ET-1000 and can drive 3 SMB-10s or 3 SMB-1000s to form an 80 port system. The SMB-1000 is a very compact test system.

The SMB-10 needs to be driven by an external ET-1000 or another SMB-1000. Three additional SMB-10s or SMB-1000s may cascaded to form an 80 port system.

Rear view of an 80 port SmartBits system showing the interconnection between one SMB-1000 and 3 SMB-10s.

SMARTBITS SOFTWARE:

SmartBits can be controlled in 3 different ways:

SmartWindows is an intuitive and easy to use Microsoft Windows© interface which completely controls the functionality

SmartWindows

of every SmartCard.

With SmartWindows every card can be set individually or as a part of a group. Transmissions can be sent continuously, in burst or in echo mode (transmission upon a received trigger). Packet content, packet length and interpacket gap can be set to any fixed, custom, or random value.

Three variable fields (VFD) with predefined data content can be located anywhere in the packet, overwriting the packet background pattern to generate any varying source address, destination address or protocol changes. This allows mesh tests for switches or routers. VFD 1 & 2 can be fixed or random values, or increment/decrement from an initial value; VFD 3 may be user defined patterns, fixed, incrementing, or decrementing.

On the receive side, 18 counters can monitor the number of packets or packets/second transmitted, received, collisions, byte count, triggers and the following errors: CRC, alignment, oversized and undersized packets.

Each card can independently produce one or more of the following errors: CRC, alignment, dribbling bits, undersized and oversized packets. Latency can be measured from any port to any port or group of ports with 100 nansecond resolution.

SmartApplications includes the industry standard tests for: Throughput, Latency, Packet Loss, and Back-to-Back Performance. With the added accuracy of SmartBits these tests are greatly enhanced. The pushbutton simplicity and ease of report generation provided by the Windows interface make user interaction simple.

AST main window

Advanced Switch Tests is a suite of twelve tests has been developed by Robert Mandeville, Director of European Network Laboratories (Paris), and described in an IETF Benchmark Working Group Draft. Advanced Switch Tests deploys bursty multidirectional traffic demanding vigorous packet switching for testing Ethernet switch performance in situations which are highly stressful to the switch and critical to the user. The tests are designed to exercise particular functions of the switch under test as well as determine overall performance.

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AST main window

SmartLib is a programming library of over 100 commands to fully control and monitor the SmartCards. Programming environments include Visual Basic, C/C++ using Borland or Microsoft DOS or Windows environment, and C/C++ in a UNIX environment. SmartLib enables users to design customized tests to help development or to fully automate production testing. The SmartApplications source code is available to make this process even speedier.

SPECIFICATIONS:

SmartCards

Specifications for each indivisual SmartCard is located on a separate sheet. SmartCards can intermixed in the same SmaerBits chassis. Available SmartCards are:

SE-6205 AUI Ethernet SmartCard
SC-6305 Thin Ethernet SmartCard
ST-6405 Ethernet Twisted pair (10baseT) SmartCard
ST-6410 Full Duplex Ethernet SmartCard
ST-7405 100base-TX Ethernet SmartCard
SX-7205 Fast Ethernet SmartCard (MII interface)
TR-8405 Token Ring SmartCard
VG-7605 100VG AnyLan SmartCard

Mechanical:

Dimensions 19”W x 6.75”H x 15”D
19” rack mount

Weight: 27lbs. (fully loaded)

Power:

Line Voltage: 120/240 Vac
Frequency: 50/60 Hz
Power Consumption: 400 VA

ODERING INFORMATION:

Part Number	Description
SMB-1000	SmartBits[tm] 20 slot chassis with integrated ET-1000. Requires SmartWin, SmartWin+, SmartLib, or SmartLib-U software for operation.
SMB-10	SmartBits[tm] 20 slot expansion chassis.
SE-6205	AUI Ethernet SmartCard
SC-6305	Thin Ethernet SmartCard
ST-6405	Ethernet Twisted pair (10baseT) SmartCard
ST-6410	Full Duplex Ethernet SmartCard
ST-7405	100base-TX Ethernet SmartCard
SX-7205	Fast Ethernet SmartCard (MII interface)
TR-8405	Token Ring SmartCard
VG-7605	

SMB-AST	SmartBits Advanced Switch Tests for: Ethernet to Fast Ethernet Switching, Throughput, Head-of-Line Blocking, Backbone Switching, One-to-many Switching, Many-to-many Switching, Illegal frame handling, Broadcast Frame handling, Maximum forwarding rate, and Minimum interframe gap.
SmartLib	Programming Library with over 100 commands for custom programming SmartBits in C/C++ and Visual Basic, from DOS or Windows
SmartLib-U	Programming Library with over 100 commands for custom programming SmartBits in an UNIX environment. Includes library source code.
SUS-SMB	Software Update Support. Provides for upgrades to SmartWindows, EtherWindows, SmartApplications, SmartTests, Advanced Switch test, SmartLibrary, UNIX SmartLibrary, and firmware for 12 months.

For further information on the SmartBits systems, it's unique features and specifications, please contact our Sales Department at: (818) 700-5100 or via E Mail Sales@NetcomSystems.com

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