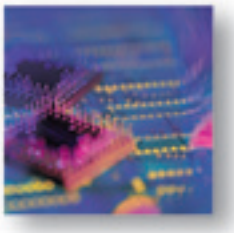


10/100 Mbps Ethernet SmartMetrics Performance Analysis

LAN-3101A

Product Overview

The LAN-3101A is a 6-port, full/half duplex, Ethernet/Fast Ethernet SmartMetrics™ module for the SmartBits® SMB-600 or SMB-6000B chassis. Two of these modules (12 ports) may be used in an SMB-600 chasis. Twelve LAN-3101A modules may be used in an SMB-6000B chassis, providing a total of 72 SmartMetrics ports.

The LAN-3101A is designed for IEEE-compliant 10Base-T and 100Base-TX systems and supports autonegotiation, VLAN tagging, and flow control to the IEEE standards 802.3p, 802.3Q, 802.3ac, and 802.3x.

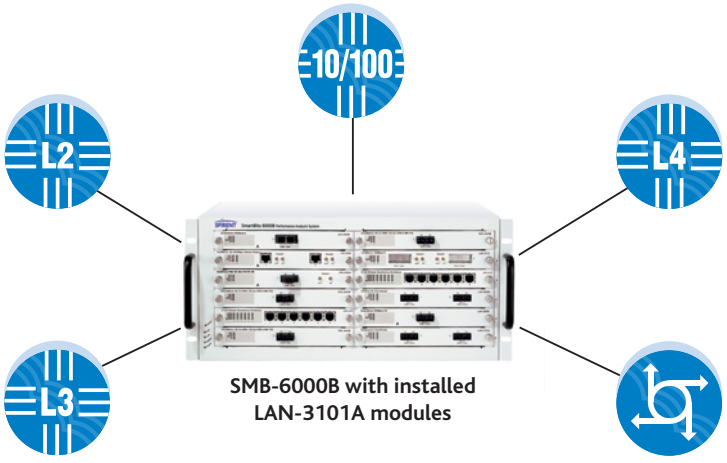
The SmartWindow™ GUI supplied with the LAN-3101A makes it easy to perform frame loss, stream latency, and sequence tracking tests on systems ranging from a single device under test to a complex routed network. Tests supported by the LAN-3101A are also available via SmartLib™, allowing for integration with existing C, C++, or Tcl automated tests.

Product Features and Benefits

- High port density – facilitates easy and rapid simulation of large, complex network configurations required to develop, test, and validate the function and interoperability of Layer 2 and Layer 3 devices.
- Full wire-rate traffic generation and analysis – enables stress testing and performance analysis.
- Data integrity checking – allows verification of payload data through the DUT.

Specifications

- Interface
  - IEEE 802.3 series 10Base-T, 100Base-TX specifications
- Connector type
  - RJ-45
- Line Rate
  - 10 Mbps or 100 Mbps, user-controlled or autonegotiate
- Port Density
  - 6 ports per LAN-3101A module
- Transmit Characteristics
  - Full line-rate: (10/100 Mbps) transmit
  - Duplex operation: full/half
  - Rate/duplex: auto-negotiate or manually selectable
  - Frame length: 24-1,600 bytes (without FCS), random (L2 mode only)
  - Interpacket gap: for 100 Mbps = min. 960 nsec, max. 2.68 seconds; for 10 Mbps = min. 9.6 usec, max. 26.8 sec; or random (L2 mode only)
  - Background frame data fill pattern: user-specified or random
  - Error generation: CRC, dribble bit, alignment, symbols (100 Mbps mode only), data integrity (per stream; L3 mode only)
  - Error detection: CRC, alignment, oversize, undersize, dribble, data integrity
  - VFD 1, VFD 2: up to 6 bytes, anywhere in a packet; static, increment, decrement, random. Cycle: max. 4 billion; increment and decrement modes only. Stutter: max. 4 billion; increment and decrement modes only.
  - VFD 3: 2K byte buffer
- Stream-based Transmit Mode
  - Up to 1,000 streams per port
  - Up to 64K flows on each stream via IP source or destination addresses. Ability to vary MAC address simultaneously with IP address.



SMB-6000B with installed LAN-3101A modules

LAN-3101A applications

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- Frame-based Transmit Modes
  - Continuous: constant frame transmit.
  - Single burst: up to 4 billion packets in a single burst.
  - Multiburst: up to 4 billion repetitive bursts with userdefined delay between bursts (same restrictions as interpacket gap).
  - Continuous Multiburst: runs multiburst mode continuously.
- Management Frame Transmit
  - Ability to configure the module's MAC and IP address, Netmask and Gateway
  - User-selectable Ping, SNMP, and RIP frequency
  - Ability to reply to ARP requests
- Capture
  - Full line-rate (10/100 Mbps) capture and analysis
  - Frame Length: 18-2,006 bytes
  - Frame selection: entire frame only
  - 6500 frame capture buffer for frames
  - Pre-capture filtering on: CRC errors, undersize, oversize, data integrity errors, alignment errors, received triggers, or all
- Triggers
  - Two triggers up to 6 bytes each
  - Trigger combinations: Trigger 1 only, Trigger 2 only, Triggers 1 and 2, Trigger 1 or 2
- Data Integrity Protects (on transmission) and verifies (on reception), the integrity of the payload content; applies to non-VLAN IP type streams only.
- Counters
  - Transmitted and received frames
  - Received bytes
  - Collisions
  - Alignment errors (Rx)
  - CRC errors (Rx)
  - Fragment/undersized frames (Rx)
  - Oversize frames (Rx)
  - Triggers (Rx)
  - Tags (Rx and Tx)
  - Data integrity detected errors (Rx)
  - VLAN frames (Rx)
  - Pings (requests Rx and Tx; replies Rx and Tx)
  - ARPs (requests Rx and Tx; replies Rx and Tx)
  - RIP frames
  - SNMP frames
  - Good/bad IP checksums
  - Good/bad TCP checksums

SmartMetrics Test Functions

The SmartMetrics tests emulate live network traffic. They provide information about the relationships and timing of frames so you can evaluate the functionality and performance of a device under load. They dynamically track data per stream and any change in latency. SmartMetrics tests include:

- Sequence Tracking: This provides throughput and frame loss testing on a per-stream basis. This test also provides precise readings of the number of frames received in and out of sequence.
- Latency over Time: The user selects a time interval such as every 10ms. For each port, the test records the number of frames received, minimum latency, and maximum latency. The test also calculates the average latency for each port.
- Latency per Stream: This test records the minimum latency and maximum latency, and calculates the average latency for each traffic stream.
- Latency Distribution: The user selects up to 16 time intervals. Within each time interval and for each stream, the following are displayed: transmitting port number, stream number, total number of frames received, and the number of frames received.
- Raw Tags: In this test, frames are stored and sent to the application without any calculations or filtering performed on the stream tags received. Up to 130,000 records are stored. Module transmit time, receive time, and delta (in ms) are recorded per tag.
- Frame Variation: This test measures variations in how soon one packet follows another in a stream. The test measures, for example, the time interval between packets 1 and 2, then between packets 2 and 3, and so on as the packets arrive at the device under test. This test plots the number of packets that arrive within each of the 16 userspecified time intervals.

Supported Applications

- SmartWindow
- SmartLib Programming Library
- ScriptCenter™
- SmartApplications™
- SmartFlow™
- SmartVoIPQoS™
- SmartMulticastIP™
- AST II™
- SmartTCP™
- SmartxDSL™
- SmartCableModem Test™
- WebSuite™

Requirements

- The LAN-3101A module requires one slot in an SMB-600 or SMB 6000B chassis.
- An IBM or compatible Pentium™ PC running Windows 98/2000/NT, with mouse and color monitor.

Ordering Information

LAN-3101A

10/100Base-TX Ethernet, 6-port, SmartMetrics module

SUS-SMB

12-month Software Update Support Service

LAN-3101 A

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