Test & Measurement

- sales
- rentals
- calibration
- repair
- disposal

Complimentary Reference Material

This PDF has been made available as a complimentary service for you to assist in evaluating this model for your testing requirements.

TMG offers a wide range of test equipment solutions, from renting short to long term, buying refurbished and purchasing new. Financing options, such as Financial Rental, and Leasing are also available on application.

TMG will assist if you are unsure whether this model will suit your requirements.

Call TMG if you need to organise repair and/or calibrate your unit.

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Repair

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Level 5
Review & Renew

Level 2 ➔ Calibration
Calibration

Recycled

Level 1 ➔ Acquisition
Acquisition

Purchase
Lease
Rent

Solution Centre
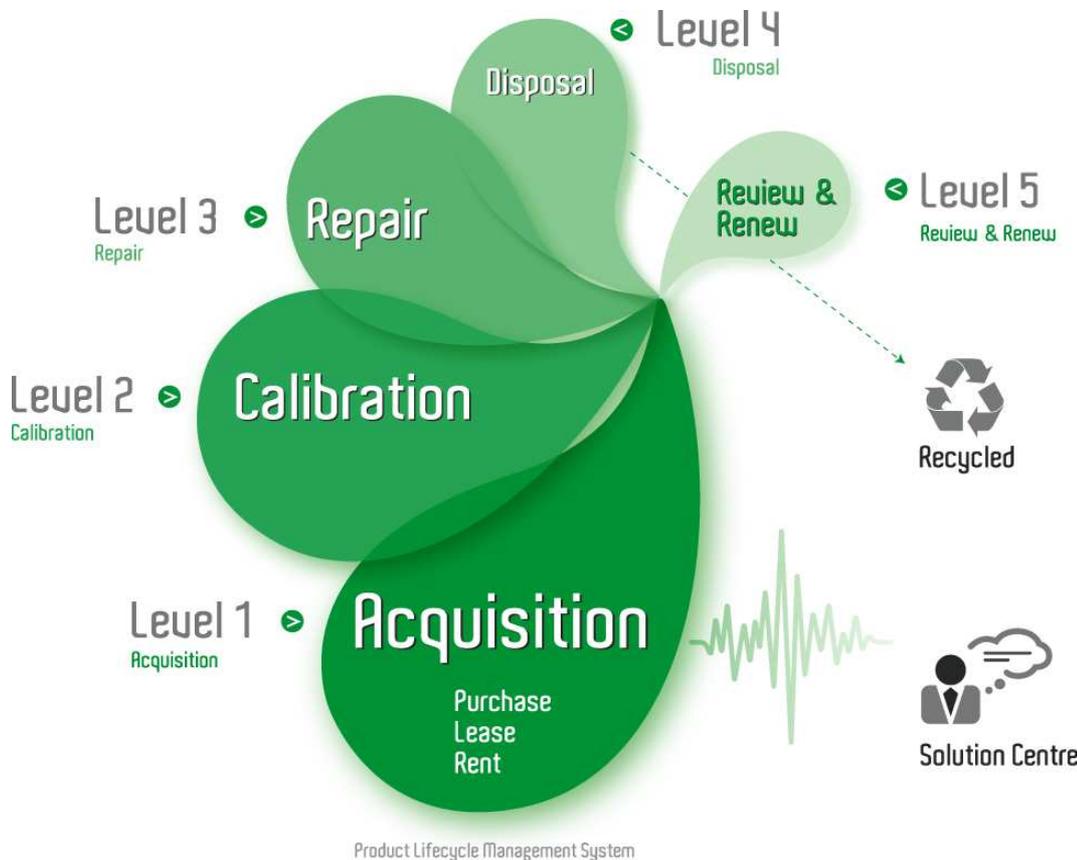
Product Lifecycle Management System

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Form 080/01

NATA   CERTIFIED MANAGEMENT SYSTEM   AIDN

10/100 Mbps Ethernet SmartMetrics Performance Analysis
LAN-3101B

Product Overview

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

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

The SmartWindow™ GUI supplied with the LAN-3101B 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-3101B are also available via SmartLibrary™, allowing for integration with existing C, C++, or Tcl automated tests.

Product Features and Benefits

- High speed IPv4 and IPv6 traffic generation and analysis.
- 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: ESD protected RJ-45
- Line Rate: 10 Mbps or 100 Mbps, fixed or autonegotiate
- Port Density: 6 ports per LAN-3101B module
- Transmit Characteristics
  - Full line rate: (10/100 Mbps) transmit
  - Duplex operation: full/half
  - Rate/duplex: auto-negotiate or manually selectable
  - Frame length: 24-16,000 bytes (without CRC), random (L2 mode only), and jumbo frames
  - 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, symbol (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.
  - Stutter/repeat VFD1/VFD2 values
  - VFD 3: 2K byte buffer
- Stream-based Transmit and Receive Mode
  - Up to 1,000 IPv4 Tx streams per port
  - Up to 500 IPv6 Tx streams per port
  - IP Multicast for up to 1000 groups per Rx port, thousands per Tx port.

Spirent Communications
26750 Agoura Road
Calabasas, CA
91302 USA
E-mail: productinfo
@spirentcom.com

Sales Contacts:
North America
+1 800-927-2660
Europe, Middle East, Africa
+33-1-6137-2250
Asia Pacific
+852-2511-3822
All Other Regions
+1 818-676-2683

www.spirentcom.com

SmartBits 6000C with installed LAN-3101B modules

LAN-3101B applications
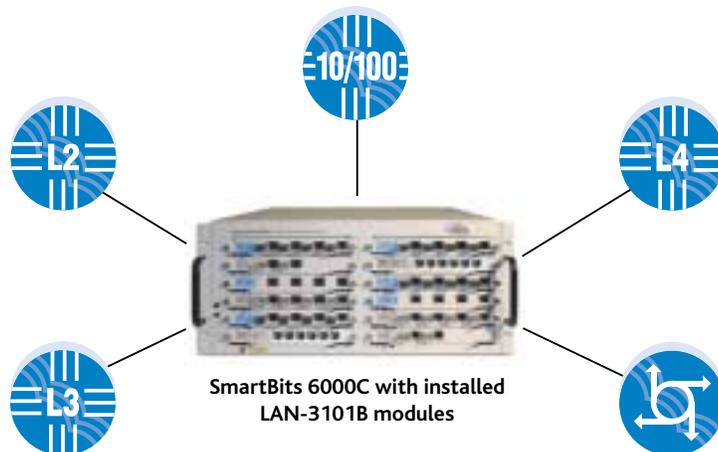
SPIRENT
Communications

Analyze | *Assure* | *Accelerate*™

- Up to 64K Tx flows on each stream in which IP and MAC addresses, and TCP/UIDP port numbers can vary. Analyzes up to 64K streams per Rx port.
  - Continuous: constant frame transmit
  - Single burst: up to 4 billion packets/frames in a single burst
  - Multiburst: up to 4 billion repetitive bursts with user-defined delay between bursts (same restrictions as interpacket gap)
  - Continuous Multiburst
  - Multiple VLANs per port and per subnet
  - Auto-calculation of checksums for IP, TCP, and UDP
  - IP checksum verification on received frames
  - DHCP with optional VLAN tags
- 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 send ARP and Ping requests and replies for streams and flows
  - Supports gratuitous ARP requests
- IPv6 Support
  - Stateful IPv6 Neighbor Discovery
  - Stateful Router Discovery
  - Stateless address auto-configuration with duplicate address detection
  - Next-Hop Discovery
  - IPv6 over IPv4 Tunneled Stream support
- Capture
  - Full line-rate (10/100 Mbps) capture and analysis
  - Frame Length: 18-2,006 bytes
  - Frame selection: entire frame only
  - 13K standard frames and 1.4K jumbo 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.
  - Supported on VLAN-tagged and untagged IPv4 (IP, UDP, TCP), IPv6 (IP, UDP, TCP), tunneled IPv6 over IPv4, tunneled UDP-IPv6 over IPv4, and tunneled TCP-IPv6 over IPv4
- 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
- IGMP (Tx, Rx, joins, leaves, unknown frames, RX checksum errors, Rx Length errors, and Rx Group w/ wrong version)

SmartMetrics Test Functions

The SmartMetrics tests let you characterize your network under varying traffic conditions, perform what-if analysis, and make intelligent inferences. By providing sophisticated histogram results that show the correlation of performance vectors, the tests provide information about the relationships and timing of flows. With this approach, you can easily evaluate the functionality and performance of a device under load and with a number of variable conditions. SmartMetrics tests include:

- Sequence Tracking: This test provides throughput and frame loss testing on a per-stream basis. The test also provides precise readings of the number of frames received in and out of sequence.
- Latency over Time: In this test, 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: In this test, 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 user-specified time intervals.

Supported Applications

- AST ll™
- SmartApplications™
- SmartBits Automation
- SmartCableModem Test™
- SmartFlow™
- SmartLibrary
- SmartMulticastIP™
- SmartTCP™
- SmartVoIPQoS™
- SmartWindow
- SmartxDSL™
- WebSuite™

Requirements

- The LAN-3101B module requires one slot in a SmartBits 600x or 6000x chassis.
- An IBM or compatible Pentium™ PC running Windows® 98/2000/NT/XP, with mouse and color monitor, depending on the controlling software application.

Ordering Information

LAN-3101B

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

Spirent Communications offers a variety of ServiceEdge™ maintenance and support packages. For more information, visit the Spirent website at www.spirentcom.com or contact your Spirent sales representative.

LAN-3101 B

Spirent Communications
26750 Agoura Road
Calabasas, CA
91302 USA
E-mail: productinfo
@spirentcom.com

Sales Contacts:
North America
+1 800-927-2660
Europe, Middle East, Africa
+33-1-6137-2250
Asia Pacific
+852-2511-3822
All Other Regions
+1 818-676-2683

www.spirentcom.com

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