

# Multi-layer SmartMetrics™ SmartCards ML-7710/ML-7711

## Product Overview

The SmartBits® ML-7710/ML-7711 enable the simulation of large, complex network configurations that are required to develop, test, and validate the performance and interoperability of Layer 2 and Layer 3 devices. The ML-7710 is a full/half duplex, Ethernet/Fast Ethernet SmartMetrics SmartCard for the SMB-200/2000 chassis. The ML-7711 is the corresponding fiber interface, Fast Ethernet SmartMetrics SmartCard.

## ML-7710/ML-7711 Specifications

- Interface
  - ML-7710: IEEE 802.3 series 10/100Base-T
  - ML-7711: 100Base-FX specifications
- Connector type
  - ML-7710: 10/100Base-T, RJ-45
  - ML-7711: 100Base-FX, MTRJ, 1300nm, multi-mode fiber
- Line Rate
  - 10 Mbps or 100 Mbps, user-controlled or autonegotiate
- Port Density
  - 1 port per ML-7710/ML-7711 SmartCard
  - 4 ports maximum per SMB-200 chassis
  - 20 ports maximum per SMB-2000 chassis
  - 640 ports may be controlled from one workstation via 32 chassis

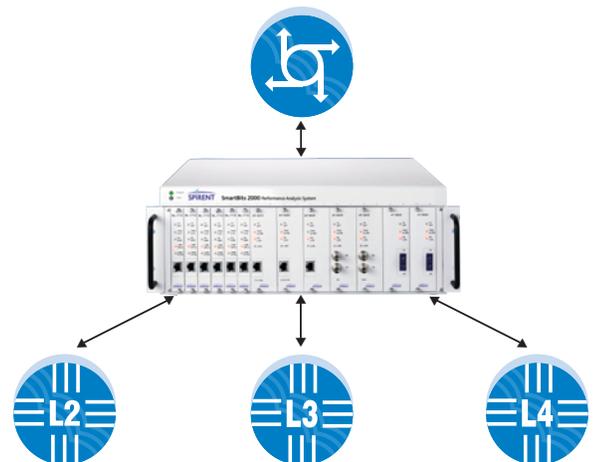
## Transmit Specifications

- General for frame or stream based transmit
  - Full line-rate (10/100 Mbps) transmit
  - Full/half duplex operation
  - Auto-negotiate or manually select rate/duplex
  - Frame Length : 24–1,600 bytes, random
  - Interpacket gap: at 100 Mbps = min 960 nsec, max 1.6 sec, 40 nsec increments or random; at 10 Mbps = min. 9.6 usec, max 16 sec, 400 nsec increments or random
  - Background frame data fill pattern: user-selectable or random data
  - Selections: incrementing/decrementing bytes, all zeros, all ones, or user-selectable for the first 64 bytes
  - Errors: CRC, dribble bit, alignment, symbol, oversize, undersize
  - Protocol assist: ARP, DHCP, ICMP, IGMP, IP, IPX, RARP, RIP, TCP, UDP, VLAN, 802.1p, 802.1q, pause control frame, and custom
- Modes
  - Continuous: constant frame transmit
  - Single burst: up to 16 million frames in a single burst
  - Multi-burst: up to 65,536 bursts with a user-defined delay (max 1.6 sec) between bursts
  - Continuous Multi-burst: runs multi-burst mode continuously

- Frame-based transmit
  - May insert up to three varying data fields:
    - **VFD1, VFD2**
      - Length: 0–6 bytes
      - Offset: 0–60 bytes
      - Value: static, random
      - Increment/decrement cycle count: 0–16,777,215
    - **VFD3**
      - Length: 0–2,048 bytes
      - Offset: 0–60 bytes
      - Value: sequence through user-specified 2,048 byte buffer
  - **Alternate Frame**
    - Send Frequency: 0–16,777,215 times standard frame transmitted
    - Value: User-specified, including CRC, dribble, symbol errors
- Stream-based transmit
  - Streams per port: 0–1000
  - Flows per stream: 1–64K (via IP source or destination addresses)
  - Ability to vary MAC address simultaneously with IP address
- Management frame transmit
  - Ability to configure the card's MAC and IP address, Netmask, and Gateway
  - User-selectable PING, SNMP, and RIP frequency
  - Ability to reply to ARP requests

## Capture Specifications

- Full line-rate (10/100 Mbps) capture and analysis
- Frame Length: 24–1,600 bytes
- Capture buffer: 475 packets



ML-7710/ML-7711 application

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- Triggers
  - Two six-byte triggers with bit-selectable match, no match, don't care
  - Trigger actions: start/stop transmit, start/stop capture
  - Combinations: Trigger 1, Trigger 2, Trigger 1 or 2, Triggers 1 and 2
- Checksums
  - IP/TCP calculated in software
- Counters
  - Transmitted and received frames
  - Transmitted and received bytes
  - Collisions
  - Alignment errors
  - CRC errors
  - Fragment/undersized frames
  - Oversized frames
  - Triggers received
  - Tags
- Group Start/Group Stop
  - Multiple ML-7710/ML-7711 SmartCards can be controlled to start and stop simultaneously.

### Supported Applications

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

### Smartmetrics Test Functions

The SmartMetrics tests emulate live network traffic. They provide information about the relationships and timing of frames so that 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. Sequence tracking provides throughput and frame loss testing on a per-stream basis. It also provides precise readings of the number of frames received in sequence, the number of duplicate frames received, and the number of frames expected, but not received.
- 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. The test records the minimum latency and maximum latency, and calculates the average latency for each traffic stream.
- Latency Distribution. The user selects up to 8 time intervals. The following information is displayed within each time interval and for each stream: transmitting port number, stream number, total number of frames received, and the number of frames received within each interval.
- Raw Tags. In the Raw Tags 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 can be stored. SmartCard transmit time, receive time, and delta (in  $\mu$ Sec) are recorded per tag.

### Requirements

- The ML-7710 or ML-7711 each require one slot in an SMB-200/2000 chassis.
- An IBM or compatible Pentium™ PC running Windows® 98/2000/NT, with mouse and color monitor.

### Ordering Information

#### ML-7710

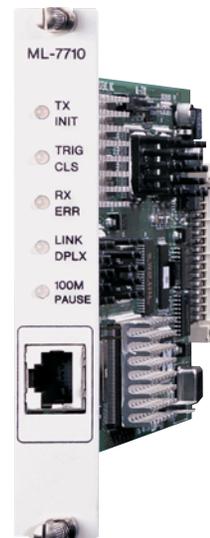
10/100Base-T Ethernet, 1-port, SmartMetrics SmartCard

#### ML-7711

100Base-FX Ethernet, 1-port, SmartMetrics SmartCard

#### SUS-SMB

12-month Software Update Support Service (includes firmware support)



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