

Spirent TSN & Automotive M1 Appliance

Compact Layer 2-3 Test Platform

Solution Overview

Spirent TSN & Automotive M1 Appliance is the industry's highest density, compact appliance that offers a comprehensive portfolio of products that will help generate, analyze, capture, and filter network packets.

M1 Appliance combines Spirent's industry-leading Layer 2-3 traffic generation and analysis with powerful network emulation and application layer protocols for emulating a wide range of device types, users, and protocols.

The M1 also delivers the highest performance with the most competitive total cost of ownership (TCO) in a compact 2U appliance form factor. The M1's flexibility makes it perfect throughout the test lifecycle for conformance, interoperability, functional, performance, and benchmark testing.

Applications

TSN & Automotive M1 is ideal for Automotive OEMs, Tier 1s, component manufacturers and chip makers performing:

- R&D testing involving technology feasibility studies and performance modeling
- Device and protocol functional testing
- Conformance and certification testing: Avnu Alliance, OPEN Alliance, AUTOSAR
- Device, sub-system, or services performance characterization, scalability and availability
- Stress testing requiring higher device and traffic emulation scaling capability and higher physical interface connection
- Device benchmarking: test using IETF RFC 2544, RFC 2889 and RFC 3918 methodologies with easy test setup using dynamically bound traffic and automated wizards

Realism & Productivity

- Realistic Layer 2-3 traffic generation to test Quality of Service (QoS) and Time Sensitive Networking (TSN) & realistic user and endpoint emulation to test applications and the Software Defined Vehicles of the future
- Real-time traffic and protocol controls enable the tester to validate and troubleshoot problems by altering the test configuration while the test is running
- Real-time results views and analytics allow the user to see how the network responds to changes in specific test conditions without having to stop the test and save the results



Features & Benefits

- Multi-speed, 10M/100M/1G/2.5G/5G/10G Ethernet for flexible interconnect with various options, incl. T1S, Base-T1 or Base-T copper, or -SX/-LX optical transceivers
- Flexible configurations, from 4 to 20 ports, with per-port reservation available
- 2.5 ns Tx timestamp resolution with intra-chassis and inter-chassis synchronization
- Full chassis chaining and external timing synch available via direct connect, NTP, PTP, GPS, and CDMA
- Low noise for benchtop operation in proximity to users
- Traffic and protocol performance identical to fX2 mainframe test modules and fully interoperable with all Spirent TestCenter hardware
- 100% line rate for frames of 58-16383 bytes / Sub-line rate for frames from 33-57 bytes
- Full suite of Spirent TestCenter protocols and test packages are available
- Full support of TWorkbench conformance & interoperability test suites for TSN and OPEN TC8/ TC11
- Built-in wizards and automated test scenarios reduce test setup and execution times

Technical Specifications

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Inter-NIC and Inter-system Time Synchronization	<p>Stratum-3 rated oscillator is the default time source. Transmit line clock is at the precise nominal Ethernet rate $\pm < 1$ PPM on initial shipment. Accurate to ± 4.6 PPM 15 years of operation</p> <ul style="list-style-type: none"> • Frame time-stamp resolution of 2.5ns • GPS and CDMA-based external time sources are supported • IEEE 1588v2 and NTP packet-based external time sources are supported • TIA/EIA-95B-based external time sources are supported
Histograms	Port-level histograms
Operating Condition	<ul style="list-style-type: none"> • Supported for 50° to 95° F (10° to 35° C) when using transceiver rated up to 5W of type 2A with a transceiver case temperature thermal limit of 70° C • Minimum operating temperature is 41°F (5° C) • 10% to 80% relative humidity (non-condensing)
AC Input Range	100-240VAC (Autosensing)
Max Power Draw	Maximum of 2000W
Product Weight	<p>Unit installed weight: 36 lb. (16.3 kg)</p> <p>Shipping weight: 48 lb. (21.8 kg)</p>
Product Dimensions	<p>2U rackmount height</p> <p>20" (D) x 17.5" (W) x 3.5" (H) or 50.80cm x 44.45cm x 8.89cm</p>

Ordering Information

Kit Number	Ports & Speeds	Media Support	
AUTO-M1-KIT-06	16x 10M/100M/1G SFP	100M/1G BASE-T1 10M/100M/1G BASE-T	1G BASE-SX 1G BASE-LX
AUTO-M1-KIT-09	4x 10M/100M/1G BASE-T 8x 100M BASE-T1 4x 10M/100M/1G SFP	100M/1G BASE-T1 10M/100M/1G BASE-T	1G BASE-SX 1G BASE-LX
AUTO-M1-KIT-10	8x 10M/100M/1G SFP 4x 100M/1G/2.5G/10G SFP+	100M/1G BASE-T1 2.5G/5G/10G BASE-T1 10M/100M/1G BASE-T 1G BASE-SX 1G BASE-LX	2.5G/5G BASE-T 10G Direct Attach Copper Cable 10G BASE-SR 10G BASE-LR
AUTO-M1-KIT-14	8x 100M BASE-T1 8x 10M/100M/1G SFP	100M/1G BASE-T1 10M/100M/1G BASE-T	1G BASE-SX 1G BASE-LX
AUTO-M1-KIT-15	4x 100M/1G/2.5G/10G SFP+	2.5G/5G/10G BASE-T1 10M/100M/1G BASE-T 1G BASE-SX 1G BASE-LX	2.5G/5G BASE-T 10G Direct Attach Copper Cable 10G BASE-SR 10G BASE-LR
AUTO-M1-KIT-19	8x 100M/1G/2.5G/10G SFP+	2.5G/5G/10G BASE-T1 10M/100M/1G BASE-T 1G BASE-SX 1G BASE-LX	2.5G/5G BASE-T 10G Direct Attach Copper Cable 10G BASE-SR 10G BASE-LR
AUTO-M1-KIT-20	8x 10M BASE-T1S 8x 10M/100M/1G SFP	100M/1G BASE-T1 10M/100M/1G BASE-T	1G BASE-SX 1G BASE-LX
AUTO-M1-KIT-21	8x 10M BASE-T1S 8x 10/100M/1M SFP 4x 100M/1G/2.5G/10G SFP+	100M/1G BASE-T1 2.5G/5G/10G BASE-T1 10M/100M/1G BASE-T 1G BASE-SX 1G BASE-LX	2.5G/5G BASE-T 10G Direct Attach Copper Cable 10G BASE-SR 10G BASE-LR