

# 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 TTworkbench conformance & interoperability test suites for TSN and OPEN TC8/ TC11
- Built-in wizards and automated test scenarios reduce test setup and execution times
- Now with MACsec supported

## Technical Specifications

### Spirent TSN & Automotive M1 Appliance

<b>Inter-NIC and Inter-system Time Synchronization</b>	<p>Stratum-3 rated oscillator is the default time source. Transmit line clock is at the precise nominal Ethernet rate <math>\pm &lt; 1</math> PPM on initial shipment. Accurate to <math>\pm 4.6</math> PPM 15 years of operation</p> <ul style="list-style-type: none"> <li>• Frame time-stamp resolution of 2.5ns</li> <li>• GPS and CDMA-based external time sources are supported</li> <li>• IEEE 1588v2 and NTP packet-based external time sources are supported</li> <li>• TIA/EIA-95B-based external time sources are supported</li> </ul>
<b>Histograms</b>	Port-level histograms
<b>Operating Condition</b>	<ul style="list-style-type: none"> <li>• 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</li> <li>• Minimum operating temperature is 41°F (5° C)</li> <li>• 10% to 80% relative humidity (non-condensing)</li> </ul>
<b>AC Input Range</b>	100-240VAC (Autosensing)
<b>Max Power Draw</b>	Maximum of 2000W
<b>Product Weight</b>	<p>Unit installed weight: 36 lb. (16.3 kg)</p> <p>Shipping weight: 48 lb. (21.8 kg)</p>
<b>Product Dimensions</b>	<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	
<b>AUTO-M1-KIT-06</b>	16x 10M/100M/1G SFP	100M/1G BASE-T1 10M/100M/1G BASE-T	1G BASE-SX 1G BASE-LX
<b>AUTO-M1-KIT-09</b>	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
<b>AUTO-M1-KIT-10</b>	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
<b>AUTO-M1-KIT-14</b>	8x 100M BASE-T1 8x 10M/100M/1G SFP	100M/1G BASE-T1 10M/100M/1G BASE-T	1G BASE-SX 1G BASE-LX
<b>AUTO-M1-KIT-15</b>	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
<b>AUTO-M1-KIT-19</b>	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
<b>AUTO-M1-KIT-21</b>	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