

This Former Spirent Business is Now Part of VIAVI

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To learn more about VIAVI, visit viavisolutions.com/en-us/spirent-acquisition

Spirent Automotive TSN/AVB

Test Solutions for Compliance and Performance Testing

Test Automotive InCar or Car2X TSN/AVB-enabled network, cabling, devices and systems with a solution that emulates a realistic and deterministic environment accelerating product development and improving quality. Spirent's TSN/AVB solution can emulate TSN/AVB and non-TSN/AVB capable end-points allowing creation of realistic car Ethernet environment with multiple connections, domains and different traffic profiles.

Features & Benefits

- Full TSN/AVB emulation of multiple talkers or listeners on each port
- A comprehensive set of TSN standards supported
- Standard-specific wizards and result view allow easy-to-use and quick configuration and analysis possible
- Mixed TSN and non-TSN traffic generation capability on each port
- Highly scalable test topology with precise and consistent timing across the ports regardless of the scale
- TSN specific metrics and statistics measurements
- Highly accurate and precise timing measurements
- Verification of precise synchronization and presentation time
- Support for different Ethernet media types and speeds
 - 10GBASE-T1, 100BASE-T1, 1000BASE-T1, 10/100/1000BASE-T, 100M/1/2.5/5/10GbE (N-BASE-T), 10GBASE-T Ethernet and 25/40/50/100/400GbE
- Real-time capture and analysis capabilities
- Full protocol decode in Wireshark

Applications

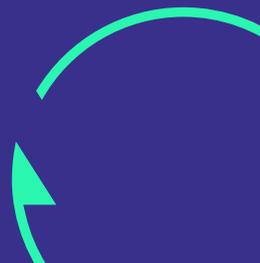
Automotive TSN/AVB test solutions are ideal fit for OEMs, Tier 1 suppliers, component and silicon manufacturers performing:

- R&D testing involving technology feasibility studies and performance modeling
- Device and protocol functional testing
- Conformance and certification testing
- Device, sub-system, or services performance characterization, scalability and availability
- Stress testing requiring higher device and traffic emulation scaling capability as well as higher physical interface connection
- Negative testing to characterize the system resilience

Spirent Automotive TSN/AVB Test Solutions offer the complete set of tools to achieve compliance and performance testing in a single hardware platform over 100/1000BASE-T1, 1G Ethernet and higher speed interfaces.

Solutions

- Conformance testing
 - AVB Conformance Test Suites based on Avnu test plan
 - TSN Conformance Test Suites based on Avnu test plan 10BASE-T1 Performance & functional testing
- Spirent TestCenter application



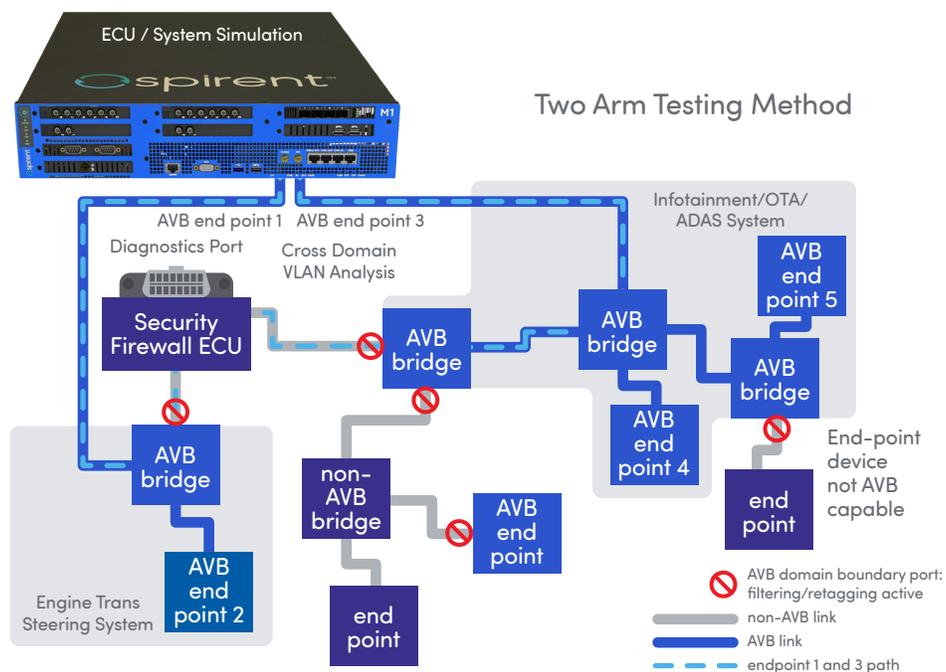
Realism

- Realistic stateful protocol emulation to exercise protocol state machines
- Realistic emulation of a TSN/AVB or a mixed (TSN/AVB and non-TSN/AVB capable) automotive Ethernet network with multiple connections, endpoints, domains and different traffic profiles

Productivity

- Intelligent Results™ allow users to quickly confirm positive results and identify problematic areas
- 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 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

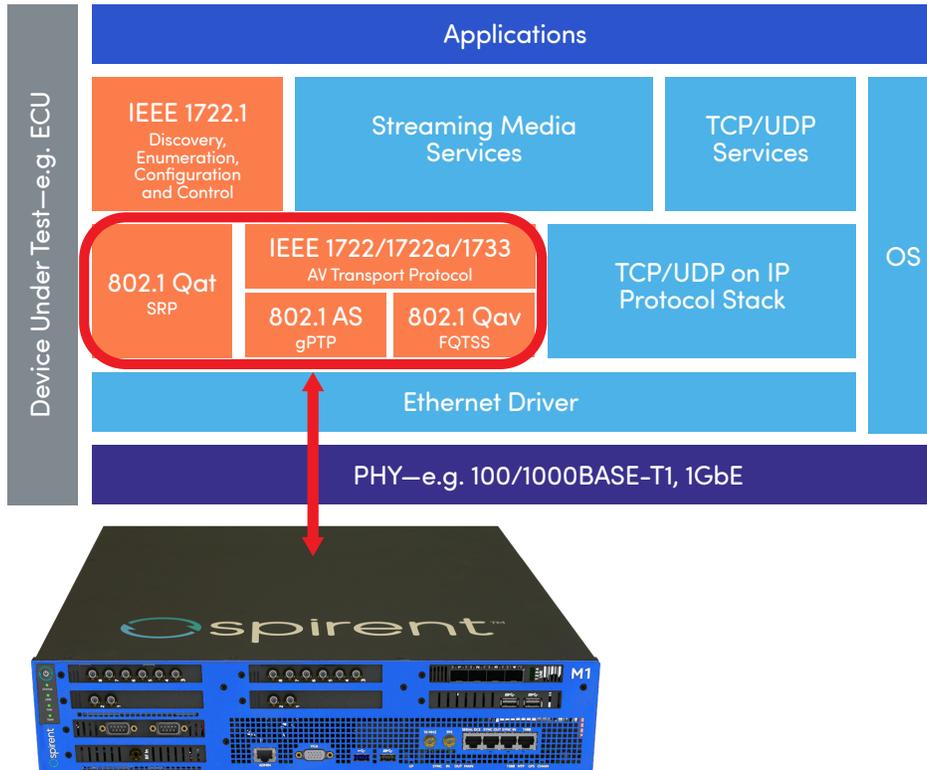
Performance & Functional Testing using Spirent TestCenter Application



The Spirent Advantage in Ethernet Testing

- Highly capable and accurate traffic generation and analysis
- Highly accurate timing and synchronization measurement (best in class)
- Multi-faceted solution for L2-3 conformance/performance, L4-7 and vulnerability testing in one platform
- Conformance, Functionality and Performance Testing in one platform
- Support for different Ethernet media types and speeds (10M to 400G)
- 100BASE-T1 interface with proper termination, filtering and latency compensation
- Solutions in portable, desktop and rack-mount form factor: C2 and M1
- Expandable and scalable test setup
- The most comprehensive overall Automotive solution with Ethernet connection

Conformance Testing - TWorkbench TSN/AVB Conformance Test Suite



Ordering Information

Spirent TestCenter Application - Appliance TSN Packages

Part Number	Description
AUTO-SWA-001	TSN- IEEE 802.1AS & AS-Rev: Enhanced Timing and Synchronization
AUTO-SWB-201	AVB IEEE 802.1BA STC Pack for Functional and Performance Testing - Includes: IEEE 802.1AS (-Rev), IEEE 802.1Qat, IEEE 802.1Qav, IEEE 1722 & IEEE 1733
AUTO-SWB-203	TSN Pack 1 - All TSN Standards Except For IEEE 802.1QBU (Pre-emption). Includes: IEEE 802.1AS (-Rev), IEEE 802.1Qat, IEEE 802.1Qav, IEEE 1722, IEEE 1733, IEEE 802.1Qci, IEEE 802.1Qbv & IEEE 802.3br
AUTO-SWB-204-C2 AUTO-SWB-204-M1	TSN Pack 2 - Pre-Emption Bundle For C2/M1 (IEEE 802.1Qbu & IEEE 802.3br)
AUTO-SWB-205-C2 AUTO-SWB-205-M1	TSN Super Pack (Includes Pack 1 And Pack 2) For C2/M1. Includes: IEEE 802.1AS (-Rev), IEEE 802.1Qat, IEEE 802.1Qav, IEEE 1722, IEEE 1733, IEEE 802.1Qci, IEEE 802.1Qbv, IEEE 802.3br & IEEE 802.1Qbu
AUTO-SWB-206	TSN Timing & Synchronization Solution Pack. IEEE 1588 & IEEE 802.1AS
AUTO-SWB-207	TSN- IEEE 802.1Qci (Per Stream Filtering & Policing) & IEEE802.1AS (gPTP) Pack
AUTO-SWB-208	TSN- IEEE 802.1Qbv (Time Aware Shaper) & IEEE802.1AS (gPTP) Pack
AUTO-SWA-010	TSN- IEEE 802.1QCB: Frame Replication and Elimination for Reliability

Spirent TestCenter Application – N4U / N11U TSN Packages

BKP-4001	TSN- IEEE 802.1AS & AS-Rev: Enhanced Timing and Synchronization
SPK-4003	TSN PACK 1 - All TSN Standards Except for IEEE 802.1QBU (Pre-emption). Includes: IEEE 802.1AS (-Rev), IEEE 802.1Qat, IEEE 802.1Qav, IEEE 1722, IEEE 1733, IEEE 802.1Qci, IEEE 802.1Qbv & IEEE 802.3br
SPK-4004	TSN PACK 2 for STC - Pre-Emption Bundle (IEEE 802.1Qbu & IEEE 802.3br)
SPK-4005	TSN Super Pack for STC (Includes Pack 1 and Pack 2). Includes: IEEE 802.1AS (-Rev), IEEE 802.1Qat, IEEE 802.1Qav, IEEE 1722, IEEE 1733, IEEE 802.1Qci, IEEE 802.1Qbv, IEEE 802.3br & IEEE 802.1Qbu
SPK-4006	TSN Timing & Synchronization Solution Pack IEEE 1588 & IEEE 802.1AS
SPK-4007	TSN- IEEE 802.1Qci (Per Stream Filtering & Policing) & IEEE802.1AS (gPTP) Pack
SPK-4008	TSN- IEEE 802.1Qbv (Time Aware Shaper) & IEEE802.1AS (gPTP) Pack
SPK-4010	TSN- IEEE 802.1QCB: Frame Replication and Elimination for Reliability

Spirent TWorkbench Application (Conformance)

TEC-SUITE-AVBA	Avnu Automotive AVB Test Suite Pack
TEC-SUITE-TSN-PRE	TTsuite-TSN-Preemption <i>Conformance Test Package for TSN Pre-emption (IEEE802.1Qbu & 802.3br)</i>
TEC-SUITE-TSN-TAS	TTsuite-TSN-Time Aware Shaper <i>Conformance Test Package for TSN Time Aware Shaper (IEEE802.1Qbv)</i>
TEC-SUITE-TSN-FP	TTsuite-TSN-Filtering & Policing <i>Conformance Test Package for TSN Filtering & Policing (IEEE802.1Qci)</i>
TEC-SUITE-TSN-RED	TTsuite-TSN-Redundancy <i>Conformance Test Package for TSN Redundancy (IEEE802.1CB)</i>
TEC-SUITE-TSN-TSP	TSN Conformance Test Suite Pack <i>TSN conformance Test Suite Pack Includes Pre-Emption (PRE), Time Aware Shaper (TAS), Filtering & Policing (FP) and Redundancy (Red) test packs</i>

Please view detailed coverage for each interface type in the TSN and AVB Coverage tables below.

TSN Test suite	Specification	Major grouping	Number of test cases
TTsuite-TSN-gPTP	Avnu Alliance® Profile Agnostic Conformance Test Plan for IEEE802.1AS Time Synchronizationg	Common BridgeSpecific	155
TTsuite-TSN-Preemption	Internal based on Avnu draft specification	MIB Acceptance Rejection Transmission Verifylink	67
TTsuite-TSN-FilteringAndPolicing	Internal based on Avnu draft specification	FlowMeter, StreamFilter and StreamGate	61
TTsuite-TSN-Redundancy	Internal based on Avnu draft specification	Relay_SeqGenSplit Relay_SeqRecElimination TalkerEndSys_SeqGenSplit ListenerEndSys_SeqRecElimination	46
TTsuite-TSN-TimeAwareShaper	Avnu Alliance Test Plan 802.1Qbv Traffic Scheduling and Shaping	Qbv	30

AVB Test suite	Specification	Major grouping	Number of test cases
TTsuite-AVB-AS	Automotive gPTP Conformance Test Plan	gPTP Tests Derived from Automotive CDS Specification Automotive GPTP Test Derived from IEEE802_1AS Generalized PTP Bridge Specific Test Common AED AED with Leader Ports AED with Follower Ports AED Bridge Only Test Automotive GPTP Test Derived from IEEE802_1AS	108
TTsuite-AVB-1722	Avnu Alliance Automotive Certification Program Endstation Test Plan for Automotive Media Formats and SR Classes	Generalized PTP Bridge Specific Test AVTP General Req for Automotive Ethernet Devices AVTP Audio Format AED V Compressed Video Formats AED V MPEG TS 61883 4 Video Formats Stream Reservation Classes Audio Clock Reference Format	73
TTsuite-AVB-Exceptions	Automotive Exception Handling Conformance Test Plan	Ethernet Exceptions IEEE_802_1as_ Exceptions IEEE 1722 Media Stream Exceptions	29
TTsuite-AVB-Diagnostic	Automotive Diagnostic Counters Conformance Test Plan	gPTP Diagnostic Counters IEEE1722 Diagnostic Counters	34
TTsuite-AVB-Startup	Automotive Network & Device Startup Conformance Test Plan	Network And Device Startup	21
TTsuite-AVB-FQTSS	Automotive Bridge SR Class & FQTSS Test Plan	Forwarding Process Validations Credit Based Shaper Algorithm Validations Priority Regeneration	23

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