

Spirent Automotive TSN/AVB

Test Solutions for Compliance and Performance Testing

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

Solutions

- Conformance Testing
 - AVB Conformance Test Suites based on Avnu test plan
 - TSN Conformance Test Suites
- Performance & Functional Testing
- Spirent TestCenter Application

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 talker 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 type and speed
 - 100BASE-T1, 1000BASE-T1, 10/100/1000BASE-T, 100M/1/2.5/5/10G (N-BASE-T) and, 10GBASE-T Ethernet and 25/40/50/100/400G
- 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

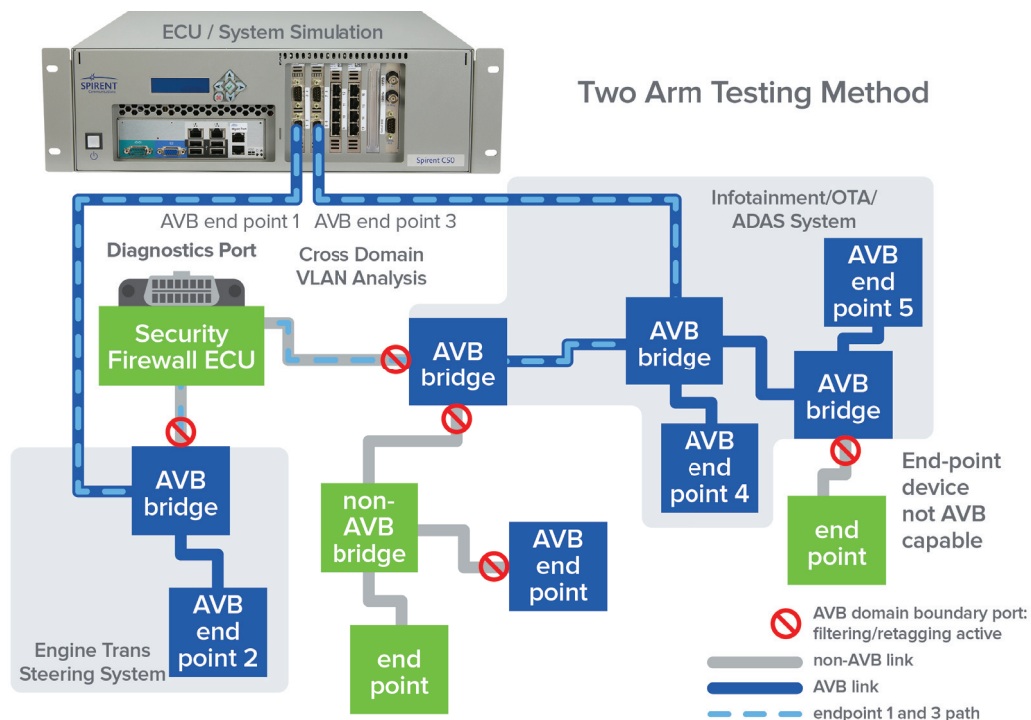
Realism

- Realistic stateful protocol emulation to exercise protocol state machines
- Realistic emulation of an 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

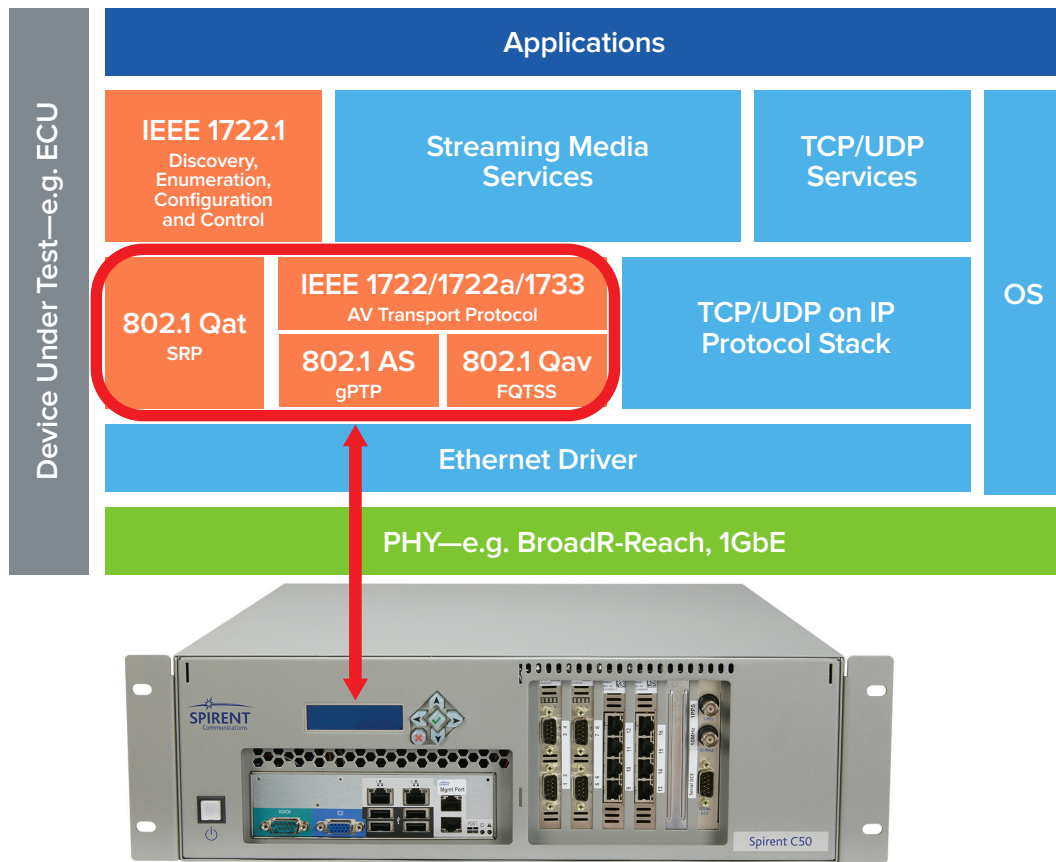
Performance & Functional Testing using Spirent TestCenter Application



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 type and speed
- Native BroadR-Reach interface with proper termination, filtering and latency compensation
- Solutions in portable, desktop and rack-mount form factor: C1 and C50
- Expandable and scalable test setup
- The most comprehensive overall Automotive solution with multiple connection technologies
 - Ethernet, CAN, LTE, GPS, etc.

Conformance Testing - TTworbench 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-C1 AUTO-SWB-204-C50 | TSN PACK 2 - PRE-EMPTION BUNDLE FOR C1/C50 (IEEE 802.1Qbu & IEEE 802.3br) |
| AUTO-SWB-205-C1 AUTO-SWB-205-C50 | TSN SUPER PACK (INCLUDES PACK 1 AND PACK 2) FOR C1/C50. 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 |

About Spirent Communications

Spirent Communications (LSE: SPT) is a global leader with deep expertise and decades of experience in testing, assurance, analytics and security, serving developers, service providers, and enterprise networks.

We help bring clarity to increasingly complex technological and business challenges.

Spirent's customers have made a promise to their customers to deliver superior performance. Spirent assures that those promises are fulfilled.

For more information, visit: www.spirent.com

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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 TTworbench Application (Conformance)

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|-------------------|--|
| TEC-SPT-AVBA-1 | Automotive AVB Conformance Test Suite Pack 1 |
| 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 Coverage Table.