

TSN-End Point Lab (PCIe)

802.1DP compliant TSN Switched End Point for evaluation and testing



KEY BENEFITS

- Conformant to TSN for Aerospace (IEEE 802.1DP) supporting network speeds of up to 1 Gbit/s
- Supports dual-channel star and ring network topologies
- Lower learning curve with comprehensive configuration tooling
- Maintain parity with standard form-factor XMC card via PCIe adapter
- Reduces risk of technology lock-in via upgrade path to TTEthernet/ARINC 664

The TSN-End Point Lab (PCIe) is a state-of-the-art solution to evaluate and develop systems requiring deterministic networking and high reliability. Supporting speeds up to 1 Gbit/s and conforming to IEEE 802.1DP, it ensures compliance with aerospace standards while delivering real-time performance. With dual-redundant network support, standard form-factor compatibility, and a path to TTEthernet/ARINC 664 this product offers unmatched flexibility and future-proofing.

Conformance to TSN for Aerospace

The TSN-End Point Lab (PCIe) is fully compliant with IEEE 802.1DP, the TSN standard for aerospace applications. This ensures deterministic communication, precise synchronization, and guaranteed latency for mission-critical systems. TSN's time-aware scheduling and traffic shaping capabilities enable predictable data delivery even under heavy network loads. Compliance with these standards enables systems' long-term interoperability and regulatory alignment.

Supported Network Topologies

Reliability is non-negotiable in aerospace environments, and this product delivers with dual-redundant network support. Redundant paths ensure continuous operation even in case of a network failure and thereby enhancing fault tolerance. Combined with TSN's resilience mechanisms, it provides robust protection against single points of failure. For systems with lower fault-tolerance needs ring network topology support can be enabled via configuration.

Standard Form-Factor Compatibility

Integration is seamless thanks to parity with standard XMC card form factors via a PCIe adapter. This design minimizes hardware changes, reducing installation complexity and accelerating deployment. Engineers benefit from compatibility with existing architectures, ensuring smooth adoption across diverse platforms. The result is lower integration costs and faster time-to-market.

Comprehensive Tool Support

^{TSN}End Point Lab (PCIe) is supported in TTTech's Slate XNS configuration tool. Slate XNS lets users configure TSN devices at the network level (like defining streams) instead of handling low-level device functions which need deep technology know-how and extensive manual configuration. Slate XNS simplifies the process of developing networks consisting of TSN devices from multiple vendors.

Path to TTEthernet/ARINC 664

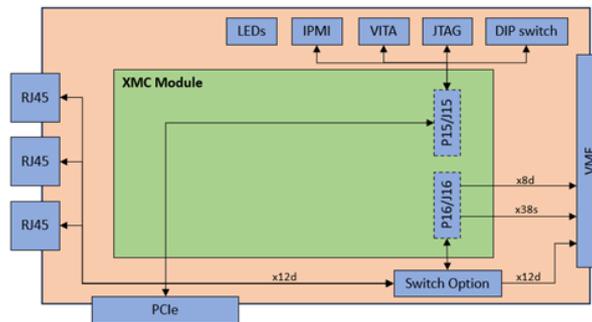
Future-proofing is built into the TSN-End Point Lab (PCIe). It offers a clear upgrade path to TTEthernet and ARINC 664, reducing the risk of technology lock-in. This flexibility allows organizations to adapt to program's needs without costly redesigns.

Application Fields

- **Technology Evaluation**
- **Architecture Development**
- **Product testing**



Block Diagram



Hardware Architecture Functional Block Diagram

General Features	Product	<p>End Point Capabilities</p> <ul style="list-style-type: none"> → Network interface: 2x 100/1000 Mbit/s full-duplex Ethernet ports (via RJ-45) → Host interface: 1x 100/1000 Mbit/s via PCIe x4 → Configurable Ethernet traffic classes and protocol services <p>Standards Compliance</p> <ul style="list-style-type: none"> → Time synchronization: IEEE 802.1AS-2020 → TSN capabilities in alignment with IEEE 802.1DP¹ <ul style="list-style-type: none"> • Bridges and Bridged Networks (802.1Q, VLAN support) • Time-Aware Shaper (802.1Q, formerly 802.1Qbv) • Credit-Based Shaper (802.1Q, formerly 802.1Qav) • Frame Replications and Elimination for Reliability (802.1CB) • Per-Stream Filtering and Policing (802.1Q, formerly 802.1Qci)
Product Deliverables		<ul style="list-style-type: none"> → Hardware – physical delivery: TSN-End Point Lab (PCIe) → Software – downloadable via TTTech Customer Portal: Linux Ubuntu image, NETCONF server and MSTP (including TE-MSTI)
Dimensions		201 x 123 x 22 (in mm)
Weight		255g
Power Supply		+ 3.3 V via PCIe
Environmental Operating Range		<ul style="list-style-type: none"> → Operating Temperature: 0°C to 55°C → Relative Humidity: 25-90%
Driver Support		→ Linux Ubuntu included
Documentation		<ul style="list-style-type: none"> → User Manual → Errata
Order Number		15337
Tools Support		12918: Slate XNS: Offline TSN network configuration (max. 5 nodes)
Related products		<ul style="list-style-type: none"> → 13193: Slate XNS Unlimited: Offline TSN network configuration (unlimited nodes) → 13823: Integration support

¹ Full compliance with 802.1DP pending its formal release.

