MILITARY TIME-SENSITIVE NETWORKING SWITCH

POWERFUL, OPEN AND FLEXIBLE COTS DETERMINISTIC ETHERNET (TSN) MANAGED SWITCH WITH EDGE-COMPUTING CAPABILITIES

RELY-MIL-TSN-SWITCH

Deterministic Ethernet for advanced QoS

Time-Sensitive Networking (TSN) to support: Scheduled, Reserved and Best Effort traffic

High-availability for mission-critical applications

Seamless redundancy via TSN-CB for selected traffic combined with standard MSTP

SW and HW microservices supported

Cutting edge multi-core CPU with FPGA to support user applications

Security-by-design

Multi-layered security to protect the system against heterogeneous threats

Cybersecurity certified

MIL-STD

1st class military enclosure

MIL-STD-461G

MIL-STD-810G

Multiple media type

Support for copper and fiber based connections

RELYUM

by SoCe

Overview

RELY-MIL-TSN-SWITCH is a Military COTS equipment focused on Ground and Airborne applications that demand Deterministic Ethernet. It supports the largest number of TSN standards in the market, which makes it suitable for any specific profile. These key features makes RELY-MIL-TSN-SWITCH platform the most reliable and multipurpose networking device for critical environments.

Time-Sensitive Networking (TSN) is the new generation Ethernet with support for communicating real-time traffic. It allows merging hard real-time, soft real-time and best effort traffic in the same network. TSN guarantees the delivery of messages on-time, the interoperability and standardization of all the devices in a Deterministic Ethernet network. Additionally, thanks to the TSN seamless redundancy mechanism (IEEE 802.1 CB) implemented on RELY-MIL-TSN-SWITCH the availability of the system is drastically improved compared to other traditional redundancy mechanisms.

This technology offers a significant cost reduction in equipment investment, maintenance, seamless integration of advanced analysis services and a reduction of dependence on a single vendor. All these advantages make Time-Sensitive Networking the reference technology in the Ethernet networks of the future.

In terms of external networking connectivity, It supports up-to 20x 1G copper and up-to 4x 1G Fiber Optic ports. An additional 1x 1G RJ45 Ethernet service port is accessible in a specific connector. The support for different media type and its distribution in the MIL-DTL-38999 connectors allow implementing complete and cost-effective network infrastructures.

The military certifications of the equipment include environmental, mechanical and electromagnetic aspects according to MIL-STD-810G and MIL-STD-461G. Additionally, the equipment has obtained the cybersecurity certification Common Criteria-LINCE by the Spanish Cryptological National Center.

RELY-MIL-TSN-SWITCH supports accurate time distribution via PTP and NTP. If GNSS sourced Grand Master operation is required, GNSS/PTP/NTP Grand Master Clock capability can be included.

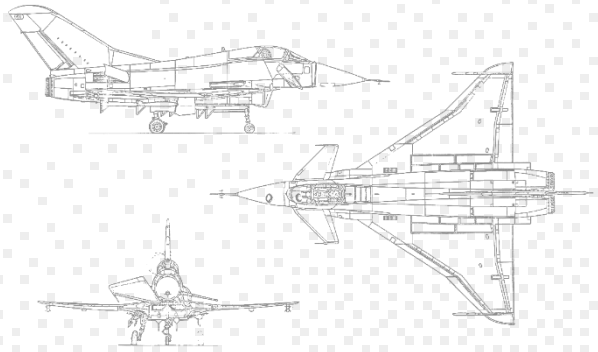
Main Features

- Versions available with different number of ports: e.g.20x 10/100/1000-BaseT TSN ports
- Versions available with different number of ports: e.g. 4x 1 GbE SR/LR Fiber Optic TSN ports
- Ports compatible with Standard Ethernet
- General purpose Ethernet Service port
- Latest generation ARM, GPU and FPGA hardware
- Time-Sensitive Networking (TSN)
- Precision Time Protocol (PTP)
- Auxiliary RS232 console port
- Edge-computing capabilities for user defined applications
- General Purpose, PPS and IRIGb Input and Output available on auxiliary connector
- Optional Grand Master/Time Server/Clock bridging capabilities
- Sealed military enclosure cold plate cooled
- Dual redundant MIL-STD-704 AC/DC power supply
- Tested and certified by independent official laboratories per MIL-STD-810G & MIL-STD-461G & Lince Common-Criteria Cybersecurity

General Networking Functionalities

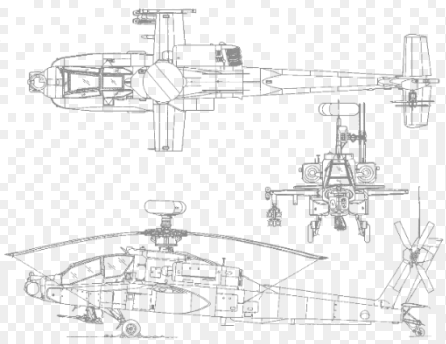
Time-Sensitive Networking (TSN)

- IEEE 802.1CB for Frame Replication and Elimination for Reliability
- IEEE 802.1AS(rev) for Time Synchronization Layer
- IEEE 802.1Qav for Reserved Traffic: Credit Based Shaper: Configurable bandwidth reservation for each traffic class
- IEEE 802.1Qbv for Scheduled Traffic: Time Aware Shaper: Configurable number of time slots
- IEEE 802.1Qcc for Network Management (RESTCONF/NETCONF)
- IEEE 802.1Qci for Stream Filtering and Policing
- IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)
- IEEE 802.1s for Multiple Spanning Tree Protocol (MSTP)
- Cut-Through support for Isochronous Scheduled Traffic
- IEEE 802.1Qat for Stream Reservation Protocol
- IEEE 802.1Qbu/802.3br for Frame Preemption



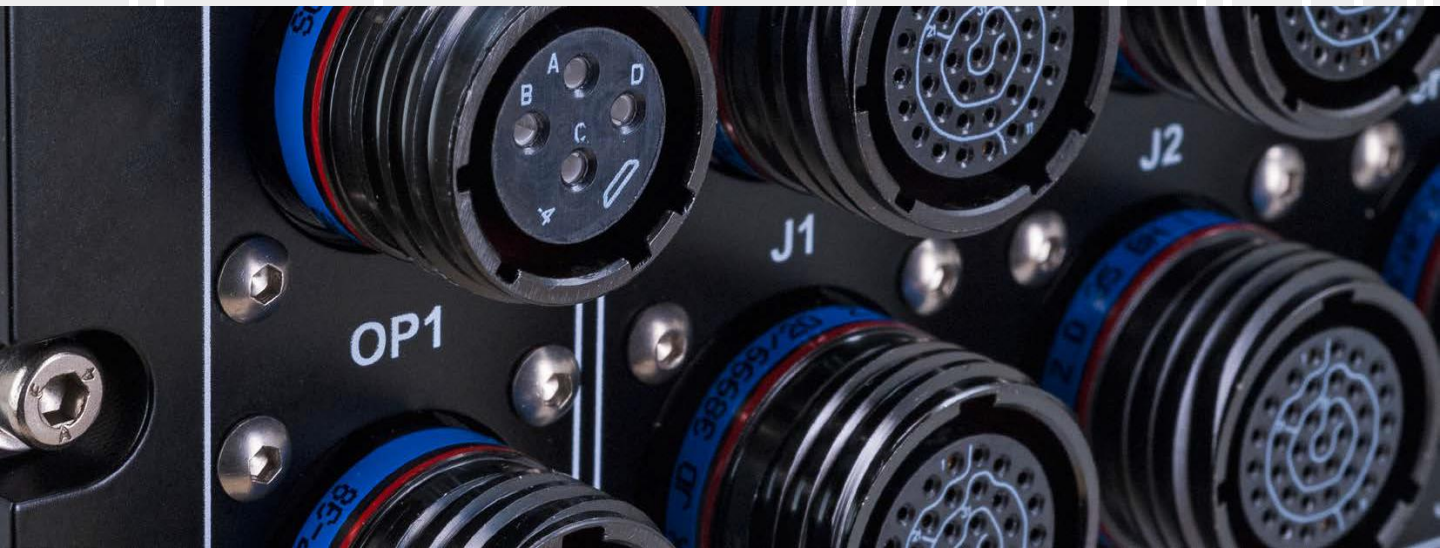
Layer 2 General Functionalities

- IEEE 802.3-2000
- Automatic MAC address learning and aging
- Static MAC Table
- Port-Based Virtual LANs (VLANs)
- IEEE 802.1Q for VLAN tagging
- IEEE 802.1Q for VLAN based Ethernet priorities
- Ethertype based switching
- IEEE 802.1p for Class of Service (CoS)
- IEEE 802.1ab for Link Layer Discovery Protocol (LLDP)
- Priority Modes: PCP (802.1p), Ethertype (Up to 16)
- Broadcast protection configurable via register
- Layer 2 multicast filtering
- Jumbo frame support
- IEEE 1588 StateLess TC (Transparent Clock)



Management and Monitoring

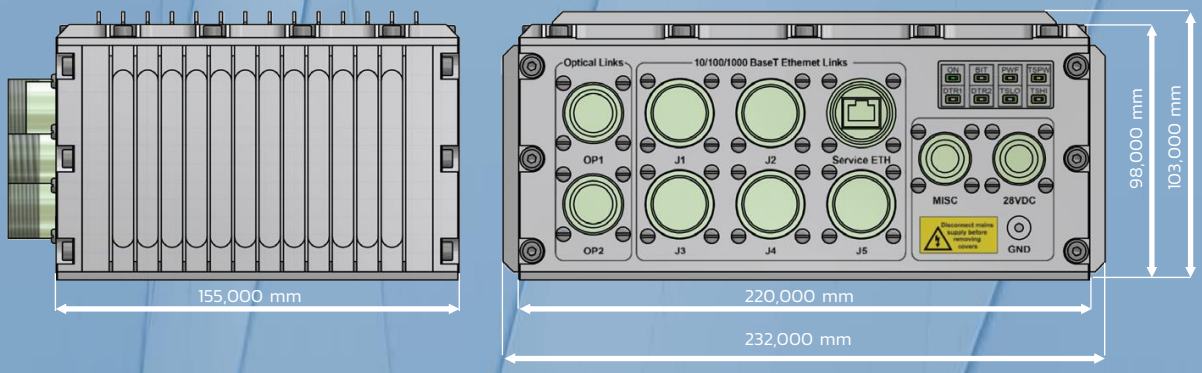
- Protocol SNMP V1/V2/V3
- HTTPS WEB interface with secure firmware/bitstream update
- Statistics independent per port
- SNMP RFC 1157/RFC
- DHCP (Client and Server)
- ANSI C Low Level library
- System Syslog
- MIB support
- Console port



MIL-STD Testing & System Dimensions

MIL-STD-461G	CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103
MIL-STD-810G	Method: 501.5 507.4, 508.5, 509.3, 513.6, 514.6, 516.6
MIL-DTL-38999, MIL-STD-704F, MIL-STD-1474D, MIL-STD-110F, MIL-STD-1275D, IP66	

Dimensions (mm)	220 (W) | 155 (D) | 98 (H)
Weight (Kg)	1,9KG (metalwork) | 3,4Kg (with PSU & Payload)
DC Power Input / Consumption	+28VDC, +48VDC, +270VDC / 50W
AC Power Input / Consumption	115VAC 40-800Hz, 220VAC 40-800Hz / 50W
I/O ports	Ethernet (5x4), fiber (2x2), RS232 (1), RJ45 (1)
Power & Control	Miscellaneous (13 pin), Power (5 pin)



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