HIGH-AVAILABILITY MILITARY SWITCH-ROUTER

POWERFUL, OPEN AND FLEXIBLE COTS L2/L3 MANAGED SWITCH WITH UP TO 26x ETHERNET PORTS AND EDGE-COMPUTING CAPABILITIES

RELY-MIL-SWITCH-ROUTER

High-availability for mission-critical applications

HSR and PRP for zero-delay recovery time in case of network failure

Full IEEE 1588 (PTP) support

Nano-second range time accuracy even over redundant networking paths

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

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Overview

The RELY-MIL-SWITCH-ROUTER is a COTS general purpose 20+5 port managed Gigabit Ethernet L2/L3 Switch that is packaged in a reliable, lightweight and compact MIL-STD-810G certified enclosure, with capability for up to four 10Gb Ethernet ports. A military compliant dual redundant power supply is fitted in full equipped versions to cover all applications and accept American & European standard AC/DC voltages for immediate worldwide operation.

Latest generation conduction-cooled electronics have been custom designed to fit enclosure mechanics and withstand harsh environments. The RELY-MIL-SWITCH-ROUTER is fitted with a complete set of active auxiliary electronics and supervisory systems that are indispensable for next generation programs and provide increased payload safety, greater system control and easy integration.

Main Features

- 20x 10/100/1000-BaseT copper ports
- Up-to 6x 1/10GbE SR/LR/BX Fiber Optic ports
- General purpose Ethernet Service port
- Dual redundant MIL-STD-704 AC/DC power supply
- System operation front panel LED indicators
- Optimized heat dissipation chassis design
- Real Time High/Low temperature monitoring
- Remote reset, battleshort & standby system control
- Dual oversized in-line EMI/EMC power Input filters
- Advanced security mechanisms and services
- Tested and certified by independent official laboratories per MIL-STD-810G & MIL-STD-461G.
- Latest generation ARM-Cortex-A53,-R5,GPU and FPGA hardware
- High-availability Seamless Redundancy (HSR)
- Parallel Redundancy Protocol (PRP)
- Precision Time Protocol (PTP)
- Multilayer management, security & monitoring
- Auxiliary RS232 console port
- Edge computing capabilities for user defined applications
- General purpose, PPS and IRIGb Input and Output available on auxiliary connector
- Sealed military enclosure cold plate cooled
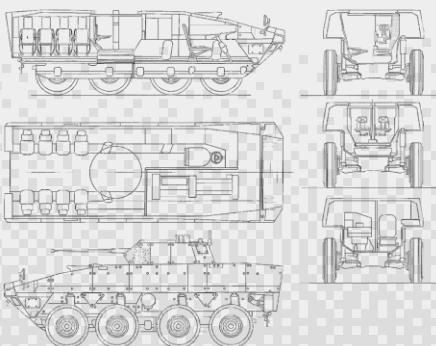
General Functionalities

Ports Configuration
- 4x 1/10G Base-SX/SR/LR fiber optic HSR/PRP port (other media options optional)
- 20x 10/100/1000Base-T copper ports
- Up-to 2x 10GBase-BX BiDir Fiber Optic link (optional)

Xilinx Zynq UltraScale + EG
- EG devices feature a quad-core ARM® Cortex-A53 platform running up to 1.5GHz. Combined with dual-core Cortex-R5 real-time processors, a Mali-400 MP2 graphics processing unit, and 16nm FinFET. EG devices have the specialized processing elements needed to excel in next generation Aerospace and Defence applications.

RAM Memory
- 32Gb DDR4 - 64-bit attached to processor subsystem

HSR / PRP Technology
- Reconfigurable Switch Architecture: flexible combination of low-latency HSR/PRP, L2 and L3 blocks

Redundancy
- IEC 62439-3 Clause 4 PRP "Parallel Redundancy Protocol"
- IEC 62439-3 Clause 5 HSR "High availability Seamless Redundancy"
- Optional IEC 62439-2 Media Redundancy Protocol (MRP)
- Optional Device Level Ring (DLR) Redundancy
- Optional IEEE 802.1w for (M)RSTP (Rapid Spanning Tree Protocol)

Layer 3 Functionalities (not applies to HSR/PRP ports)
- Layer 3 General Functionalities
- IPv4/IPv6 unicast and multicast routing
- Static routing
- Dynamic Routing:
  - OSPFv2, OSPFv3, RIPv2, BGPv4, BGPv6
  - EIGRP, PIM-DM, PIM-SM
  - VRRP
- IGMP Snooping
- DSCP ToS
- L3 Firewall
- L3 Tunneling:PPP, GRETAP, L2TPv2/v3

Security
- IEEE 802.1X access control: port & MAC based authentication
- Selective ports disabling capability
- Unsecure protocols disabling capability
- Selective port mirroring
- MAC port binding & authentication for login security
- TACACS+, and RADIUS authentication
- Secure Shell (SSH) Protocol v2
- Internal Gyroscope and Accelerometer for security and predictive maintainance purposes
- TPM 2.0 IC for identity authentication
- AES 256/HMAC/RSA 2048 encryption/authentication & signature for firmware and bitstream
- Firewall, VPN

Deterministic Ethernet
- IEEE 1588 AS profile -TSN- supported (station & switches)

Gateway
- Optional CAN 2.0 integrated ports
- Optional RS-232/422/485 buses with Modbus / Profibus / Serial console

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)

Synchronization
- IEEE 1588v2 PTP "Precision Time Protocol" profiles with E2E mode and P2P mode of operation
- IEEE 1588v2 PTP "Precision Time Protocol" over HSR & PRP
- Optional Ordinary Clock & Boundary Clock mode of operation
- S(NTP) & Client

Management and Monitoring
- Protocol SNMP V1/V2/V3
- HTTPS WEB interface with secure firmware/bitstream update
- Graphic representation of Network status (HSR DANs & VDANs)
- Statistics independent per port
- SNMP RFC 1157/RFC
- DHCP (Client and Server)
- ANSI C Low Level library
- System Syslog
- MIB support
- Console port
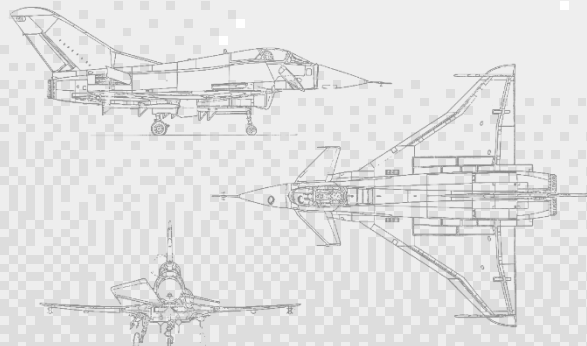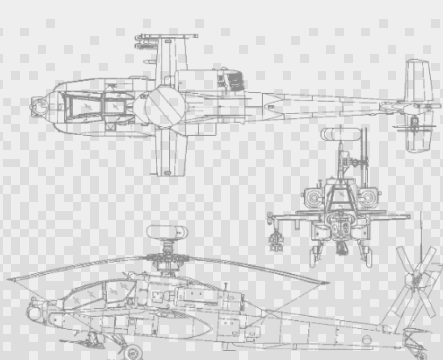
MIL-STD Testing & System Dimensions

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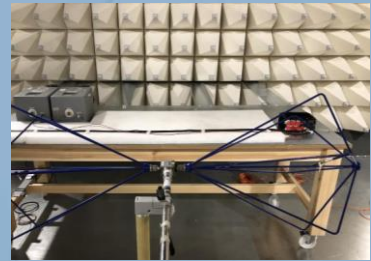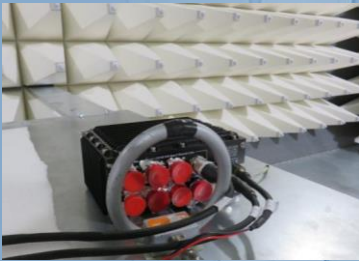
Dimensions (mm)	220 (W) | 155 (D) | 98 (H)
Weight (Kg)	1,9KG (metalwork) | 3,4Kg (with PSU & Payload)
DC Power Input / Consumption	+28VDC, +48VDC, +270VDC / 50W
AC Power Input / Consumption	115VAC 40-800Hz, 220VAC 40-800Hz / 50W
I/O ports	Ethernet (5x4), fiber (2x2), RS232 (1), RJ45 (1)
Power & Control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

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