RelyUm® Rugged



L2/L3 Secure Switch Router

MIL-SSR

MIL-10SSR

Overview

The MIL-SSR and MIL-10SSR series are military-certified secure routers that take full advantage of SOC-E's advanced and well-known networking technology to ensure secure, reliable and high-available communications in the most demanding battlefield environments for land, air and sea platforms.

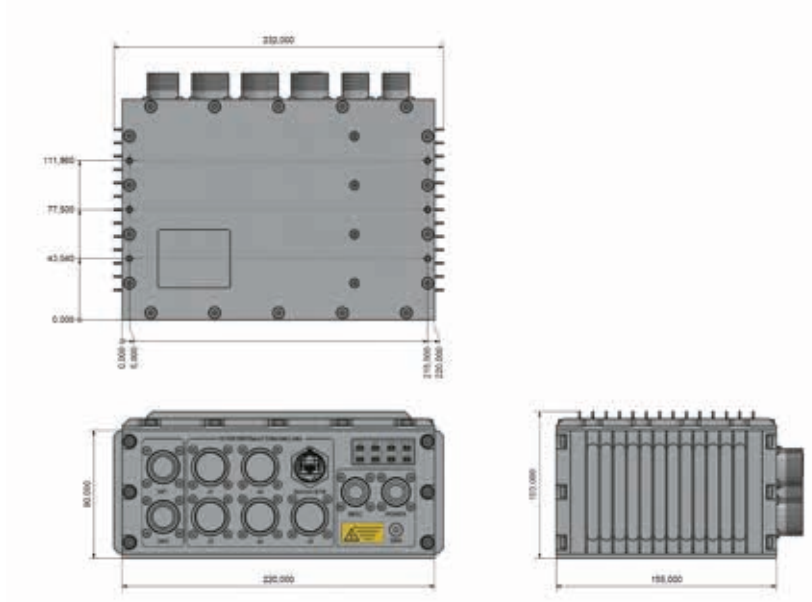
The switching electronics are implemented in a high-performance FPGA, allowing the devices to be fully customised to each customer's specific requirements. This MOTS approach, based on a field-proven COTS solution to minimise project risk, results in a SWaP interoperable all-in-one device, that combines advanced routing, firewall and VPN capabilities, with time server and edge computing features in a single hardware platform.

With fully customisable external network connectivity and a lightweight and compact MIL-STD-810G certified chassis, the MIL-SSR / MIL-10SSR series can adapt to almost any situation and meet the requirements of the harshest military programmes.

Key Features

- Up to 26 configurable **Ethernet 10/100/1000BASE-T and 1GbE/10GbE** Fibre Optic ports.
- Full in-house design (including networking and synchronization IP Cores) based on a **reconfigurable MPSoC platform** with edge computing capabilities.
- Firewall and VPN capabilities, combined with **advanced security means** including IEEE 802.1X and MACsec, among others.
- Optional **"Zero-Packet Loss" redundancy** based on HSR/PRP protocols for high-availability communications.
- Optional **Grand Master and Clock bridging** capabilities with accurate time distribution via IEEE 1588 (PTP).
- **Simplified management and monitoring** via a user-friendly HTTPS web interface or a flexible console port.
- **Sealed military grade and compact enclosure** with MIL-STD-704 / MIL-STD-1275E power supply.

Dimensions



Technical Specifications

Communication Interfaces

- Up to 22x 10/100/1000BASE-T Copper Ethernet ports
- Up to 6x 1GbE/10GbE Fibre Optic Ethernet ports
- 1 x 10/100/1000BASE-T Ethernet Service port
- 1 x PPS output (Miscellaneous connector)
- 1 x RS-232 serial line (Miscellaneous connector)
- 2 x General purpose input/output pins or PPS (Miscellaneous connector)

Synchronization

- IEEE 1588-2008 v2 (PTPv2)
- IEEE 1588 Stateless Transparent Clock (TC)
- IEEE 1588 Ordinary Clock (Master-Slave)
- Time Bridge operation: NTP <->PTP
- NTP (Server/Client)
- Optional time server and time bridging capabilities

Layer 2 Features

- IEEE 802.3-2008 (Ethernet)
- Automatic MAC address learning and aging
- Port-Based Virtual LANs (VLANs):
  - Logical segmentation of network for optimal use of bandwidth
  - IEEE 802.1Q for VLAN tagging (up to 4K VLAN groups)
  - IEEE 802.1p for Class of Service (CoS) / Quality of Service (QoS)
- IEEE 802.1AB for Link Layer Discovery Protocol (LLDP)
- Static MAC Table
- Port rate limiting
- Storm control for flooded broadcast, multicast and unicast
- Layer 2 multicast filtering
- IGMP Snooping (up to 1024 multicast filters)
- Flexible Link Aggregation (up to 4 groups with 8 members each) (Expected 2025)

Redundancy

- Spanning Tree Protocol:
  - IEEE 802.1D (STP)
  - IEEE 802.1w (RSTP)
  - IEEE 802.1s (MSTP)
- Zero-Recovery Time redundancy (optional):
  - High-availability Seamless Redundancy (HSR) - IEC 62439-3 Clause 5
  - Parallel Redundancy Protocol (PRP) - IEC 62439-3 Clause 4

Layer 3 Features

- IPv4/IPv6 unicast and multicast routing
- Static routing
- Virtual Router Redundancy Protocol (VRRP)
- DSCP ToS / QoS (optional)
- Source/Destination NAT (optional)
- Dynamic routing:
  - OSPFv2, OSPFv3
  - RIPv1, RIPv2, RIPng
  - BGPv4
  - EIGRP
  - PIM-SM (IPv4 and IPv6)

Gateway

- Edge-computing capabilities for user defined applications
- Optional CAN 2.0 integrated ports
- Support for DDS standard and MQTT protocol in KVM Virtual Machine for user application
- Optional RS-232/RS-422/RS-485 buses with Modbus/Serial console

Security

- IEEE 802.1X for port-based network access control
- MAC port binding & authentication for login security
- RADIUS authentication
- LDAP (Lightweight Directory Access Protocol)
- RBAC (Role Based Access Control)
- Selective ports disabling capability
- Unsecure protocols disabling capability
- Per port ingress and egress port mirroring including 10G mirroring
- Mirroring per VLAN and per content awareness match
- HTTPS for web interface
- Secure Shell (SSH) Protocol v2 for command line interface
- TPM 2.0 IC for identity authentication
- Encryption/authentication & signature for firmware and bitstream
- Secure-boot capability
- IEEE 802.1AE - MACsec (Media Access Control Security) support
- Custom ACLs (optional)
- Virtual Private Network (VPN):
  - Site to site and remote VPN support
  - IPsec VPN tunnels
  - L2TP VPN tunnels
  - PPTP VPN tunnels
  - Gretap VPN tunnels
  - SSL-based OpenVPN (optional)
  - IPsec aggregate performance: 75 Mbps / 250 Mbps (optional) with AES256-SHA256, 1500 bytes packet size
- Stateful inspection firewall:
  - Firewall performance: 600Mbps (with std. configuration)
  - Unlimited concurrent connections
  - IPv6 firewalling (optional)
  - Stateful failover (optional)
- Other optional security features:
  - Intrusion Prevention System / Intrusion Detection System
  - Antivirus Scanning
  - DoS Protection
  - Botnet blocking (IP reputation)
  - Web content filtering
  - Application visibility and control
- Certifications:
  - Tempest Level B rated
  - LINCE (Common Criteria based) certification

Not all the features may be supported in all the product models.

Configuration & Management

- HTTPS web interface
- SSHv2 command line interface (CLI)
- SNMP V1/V2c/V3 protocol support
- SNMP V3 encrypted authentication and access security
- SNMP over TLS support (optional)
- Netconf protocol support (optional)
- Encrypted and digitally signed firmware/bitstream upgrades
- Saving and restoring configuration
- Graphic representation of Network status (only in HSR/PRP networks)
- Internal status monitoring and logging
- Statistics independent per port
- Event notification through Syslog
- DHCP/DHCPv6 server and relay (optional)
- Built-in-Test capability including:
  - PBIT (Power-on BIT)
  - CBIT (Continuous BIT)
  - IBIT (Initiated BIT)
- In-band management via any Ethernet switch port or out-of-band via Ethernet service port
- RS-232 serial console

Processing

- Xilinx UltraScale+ MPSoC device:
  - 4x 64bit CPU ARM-Cortex-A53
  - 2x 32bit CPU ARM-Cortex-R5F
  - 1x GPU ARM-Mali 400MHz
  - 1x 16nm UltraScale+ FPGA
- Up to 4GB DDR4 RAM memory
- 32GB eMMC Flash memory
- 512Mb QSPI Flash memory

Physical & Electrical Characteristics

- Military certified fanless rugged design
- Dimensions (mm): 220(W) | 155(D) | 103(H)
- Weight: 3kg (combination of metalwork, PSU and payload)
- Power Input: 28VDC*
- Power consumption: 20-35W
- Copper, Fibre Optic, Power supply and Miscellaneous port with RS-232/ PPS capability via D38999 connector
- Service port via RJ45 or D38999 connector

* Other PSU available under demand. Contact your sales representative for more information.

MTBF

- 200,000 hours GB@25
- MTTR = 0.5 hour

Certifications

- MIL-STD-461: CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103
- MIL-STD-810: Methods: 500.5, 501.5, 502.5, 504.1, 506.5, 507.4, 508.6, 509.5, 513.6, 514.6, 516.6
- RTCA DO-160: Section 22
- MIL-STD-704F, MIL-STD-1275E
- ESD EN61000-4-2
- MIL-DTL-38999, MIL-STD-1474D, IP66, DO-254/DO-178 DAL-D certifiable

A qualification campaign is currently underway to incorporate new standards and tests.

For more information, please contact your sales representative.

Warranty

- 2 years

Export Control

- ITAR Free

Ordering Code

Ordering code	Model and description
CCFF-SSR-XX.YY	MILCCFF-SSR: 1G L2/L3 Secure Switch Router
CCFF-10SSR-XX.YY	MILCCFF-10SSR: 1G/10G L2/L3 Secure Switch Router

CC: Number of copper parts **FF:** Number of FO ports **XX:** Firmware personality code* **YY:** Hardware platform code*

*In most cases, this code is defined upon receipt of the order.

To know more about other available references, please contact your sales representative.

RelyUm®
By

MIL-SSR
MIL-10SSR

L2/L3 Secure Switch Router

SOC-E®

www.soc-e.com
info@soc-e.com

Calle Islas Canarias 19, piso -1
48015 Bilbao (Spain)