

Hermod II

RC-Series

Rugged 1/10 Gigabit Ethernet Switching System with TSN / HSR / PRP Capability



Please note: details contained within this document are subject to change | Document Code: IS0001 Jun23 | Concurrent Technologies Proprietary Information

Key Features

Hermod II is Military Commercial Off the Shelf (COTS) equipment focused on tri-service applications that demand Deterministic Ethernet.

FPGA based Switch SoC supports Switching System feature upgrades without return to factory.

1/10 Gigabit Ethernet Rugged Conduction Cooled switch optimized for Size, Weight, Power and Cost (SWaP-C) harsh environment embedded computer network applications.

Supporting up to 20 ports of non-blocking 10/100/1000 Mbps copper, and up to 4 1/10G Fiber Optic ports. An additional 1x1G RJ45 Ethernet Service port is accessible in a specific connector.

Overview

Time-Sensitive Networking (TSN) is the next generation of 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.

High-availability Seamless Redundancy (HSR) is a network protocol for Ethernet that provides seamless failover against failure of any single network component.

Parallel Redundancy Protocol (PRP) is a network protocol standard for Ethernet that provides seamless failover against failure of any network component. This redundancy is invisible to the application.

TSN Configurator to support the configuration of TSN devices once network topology and communication needs are determined. Guaranteed deterministic operation ensuring all constraints are met.

Time distribution via PTP and NTP. If GNSS sourced Grand Master operation is required, GNSS/PTP/NTP Grand Master Clock capability can be included.





Overview (Continued)

- Up to 20x 10/100/1000-BaseT copper ports
 - Up to 4x Fibre Optic ports. Options:
 - 4x 1G FO SR ports
 - 4x 1G/10G FO Short Range (SR) or Long Range (LR) ports.
 - High-availability Seamless Redundancy (HSR)
 - Parallel Redundancy Protocol (PRP)
 - Time-Sensitive Networking (TSN)
 - Precision Time Protocol (PTP)
 - Quality of Service (QoS)
- Optional Grand Master/Time Server/Clock bridging capabilities
 - Designed to meet MIL-STD-810/ DO-160/ MIL-STD-704/ MIL-STD-461
 - Operating Temperature -40°C to 71°C
 - IP67 Dust/Waterproof Aluminium Chassis
 - Circular Nickel PTFE MIL-DTL-38999 Connectors
 - Security
 - Line Rate Switching Engine

3U VPX Eco System of Solutions from Concurrent Technologies



Layer 2 Features

- 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 StateLessTC (Transparent Clock)
- IEEE 802.1s/w for (M)RSTP (Rapid Spanning Tree Protocol)

High Availability Ethernet

- IEC 62439-3 Clause 4 PRP "Parallel Redundancy Protocol"
- IEC 62439-3 Clause 5 HSR "High-availability Seamless Redundancy"

Layer 3 Features

- 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
 - GRE/TAP
- L2TPv2/v3 support

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 Grand Master capability
- S(NTP) & Client



Time Sensitive Networking

- 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 Pre-emption

Wire-Speed Cryptographic

- In-line hardware implemented crypto-processor to cipher or decipher traffic.

Management and Monitoring

- Protocol SNMP V1/V2/V3
- HTTPS Web GUI 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)
- System Syslog
- MIB support
- Console port

Power

- 28VDC, TBD W
- Over Current, Over Voltage, and inrush protected
- Meets MIL-1275/704 and DO-160 power supply with transient protections and (optional)50ms hold up

Mechanical

- Dimensions: TBD
- Weight: TBD kg (lbs)

Software Features

Software Features can be accessed through the RS232 port, which uses a simple menu-driven interface to display the configuration and prompt for changes.

Built-In Test Responder:

- Power-On BIT results
- Periodic BIT results
- Commanded BIT and results:
- Memory tests
- Virtual Cable Test
- Loopback Test

Authentication and Port Security

- Usernames and passwords
- Ethernet Port Status
- Ethernet Port Speed and Duplex
- Ethernet Port Enable and Security
- User Management
- Set the IPv4 address and the IPv6 address.
- Display manufacturing data such as firmware version, serial number, assembly, revision, etc.

Conformance / Compliance

- **Designed and manufactured using an ISO 9001:2015 / AS9100 Rev D**
- **Designed to meet :- MIL-STD-810H**
 - Operating Temp: -40C to +65C
 - Non-Operating Temp: -50C to +85C
 - Vibration: 40g RMS 20-2000 Hz MIL-STD-810H 11ms
 - Humidity, 95% non-condensing, method 507.1
- **RoHS /REACH compliant**
- **Designed to meet MIL-STD-461G**
- **Designed to meet MIL-STD-704F**
- **Designed to meet RTCA DO-160D**
- **MTBF: Calculated per MIL-HDBK-217F**
- **CE Mark**
- **EC DoC**