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The Power of IoT

Kontron CERES-TSN

Compact Rugged Ethernet Switch

Kontron **CERES-TSN** is a **compact, rugged embedded Ethernet switch** engineered to deliver **high-reliability networking in harsh environments**, specifically tailored for defense applications. It features up to 24x 1G ports and 4x 10G ports via 38999-type connectors, making it ideal for in-vehicle systems and C4I (Command, Control, Communications, Computers, and Intelligence) deployments.

-40°
70°C
Operating Temperature

Fanless Operation

IP65

TSN

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Product Highlights

The Kontron CERES-TSN is a compact, rugged Ethernet switch built for reliable embedded networks in demanding defense environments. The CERES-TSN model offers up to 28 fully managed Layer 2/3 ports (24x 1GbE, 4x 10GbE) in a small form factor with versatile switching features. The CERES-TSN model is offered in two configurations: one with 12x 1G base-T ports and 2x optional 10G base SR or LR, and another with 24x 1G base-T ports and 4x optional 10G base SR or LR. Both versions include four PoE+ ports.

Management

Kontron CERES-TSN switch is built on a Microchip® LAN9696TSN switch fabric with an integrated management processor. It supports monitoring through SNMP over serial line or Ethernet. The device provides web-based management and a command-line interface for layer 2/3 management, including IPv6 support. Additional functions include IP forwarding, multicast, routing, switching, Quality of Service, and VLANs to support complex network routing.

Bandwidth

The Kontron CERES-TSN is engineered for advanced, future-oriented applications that demand exceptional bandwidth and robust communication security. This switch delivers up to 66Gbps of line-rate multi-layer forwarding capability and incorporates comprehensive network security, data, video and other features. Additional switching functionalities include IP forwarding and multicast, routing and switching, Quality of Service (QoS), VLAN support, and more.

Key Features

- Fully managed Layer 2 / 3 non-blocking Ethernet Switch, IPv6 and support
- 12 or 24 Ports 10/100/1000 Base-T (4x with PoE+ option)
- 2 or 4 Ports 10GB Base-SR/LR
- Featured with Precision Time Protocol IEEE1588v2
- SNMP, command line and Web management interface
- Compact high density rugged housing
- Power supply for 28 VDC according to MIL-STD-1275D
- Temperature range: -40 °C to +55 °C (up to +71 °C on request)
- MIL-STD-461 F and MIL-STD-810G

Reliability and Robustness

The Microchip® LAN9696TSN switch fabric offers 10 years of reliability at full usage. The rugged conduction-cooled version meets MIL-STD-461 F and MIL-STD-810G standards for robust defense applications.

Cyber Security, Secure Deployments

Kontron CERES-TSN design is compatible with secure boot features (Upon-request).

Typical Applications

Battlefield Communication C4ISR

Networks enabling real-time information sharing between troops, command centers, and intelligence systems.

Avionic & Shipboard Systems

Networks within aircraft, ships, and other vessels for communication and data exchange.

Combat Vehicles

Networks within tanks, armored vehicles, and other combat platforms.

Tactical Communications

Secure, high-bandwidth connectivity and edge routing in distributed command networks.

Data Acquisition & Transmission

Gathering and transmitting data from various sources like sensors, radars, and other battlefield monitoring equipment.

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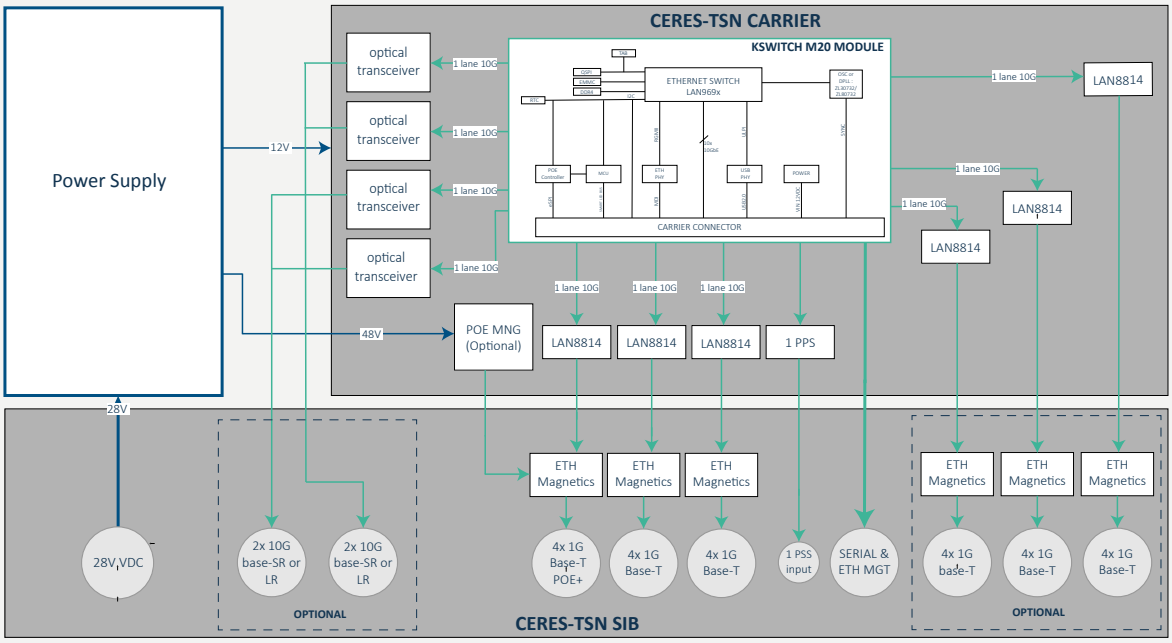
Block Diagram



CERES-TSN-2404 & CERES-TSN-1202

Compact Rugged Ethernet Switch

Technical Information

Network	Switch Device	Microchip LAN969x TSN Switch Family with Integrated 1 GHz single-core Arm® Cortex®-A53 CPU
	DDR	1G DDR4 with inline ECC
	OS	Microchip IStaX Linux® application software
	Operation Mode	Store and forward, full wire-speed, non-blocking switch core. Low latency cut-through forwarding mode
	Interfaces	Flexible port configuration: 24x or 12x 1000BASE-T (depending on configuration) Up to 4x 10G base-SR or Base-LR (depending on configuration) All ports routed on 38999 connectors with PoE capability for 4 ports (depending on configuration).
Bridge, VLANS, Protocols	Switching	IPv4/IPv6 unicast and multicast L2 switching
	Routing	IPv4/IPv6 unicast and multicast L3 forwarding with RPF
	Flow Control	IEEE 802.3x (full duplex) and back-pressure (half duplex)
	Max VLANS	4095
	VLAN Types	Port-based VLAN, IEEE 802.1Q tag-based VLAN
	Multicast Protocols	IGMPv1, IGMPv2, IGMPv3, MLDv1, MLDv2 up to 255 multicast groups IGMP snooping, querying
	Network Discovery	IEEE 802.1ab LLDP
Traffic Management & QOS	Priority	IEEE 802.1p QoS
	Number of Queues per port	8
	Scheduling Schemes	Strict Priority Queuing (SPQ), Deficit-Weighted Round Robin Queuing (DWRR)
Time Sensitive Networking	Shaping & Filtering	IEEE 802.1Qbv-2015 Time Aware Shaping IEEE 802.1Qbu/802.3br – Frame Pre-emption IEEE 802.1Qav AVB traffic shaping IEEE 802.1Qci-2017 per Stream Filtering and Policing
	Redundancy / Reliability	Redundancy with IEEE 802.1CB Frame Replication and Elimination for Reliability (FRER) Protection switching (line or ring)
	Forwarding Scheme	Cut-through option per TSN Stream and Store and Forward
	Timing & Synchronization	IEEE 802.1AS-2020 1-step and 2-step, IEEE 1588v2 1-step and 2-step for Ordinary Clock, Boundary Clock and Transparent Clock
Network Redundancy	Spanning Tree Protocol	IEEE 802.1D/1w/1S, STP/RSTP/MSTP
	Port Trunk / LACP	Static trunk or LACP (Link Aggregation Control Protocol) G.8032, MRP IEC-62439-2 2016
Security	Port Security	IP and MAC-based Access Control/Filter, Auth User / Privilege Level Control, IEEE802.1X
	Storm Control	Multicast / Broadcast / Flooding Storm Control / Port Access Control / Limiters

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Technical Information

Management	User Management Interfaces	Web-based management, Command Line Interface SNMP V1, V2c, Trap, Telnet (5 sessions) RFC 3411 SNMP Management Frameworks RFC 3414 User-based Security Model for SNMPv3 RFC 3415 View-based access Control Model for SNMP RFC 2613 SMON - PortCopy
	Management Security	HTTPs, SSH, Access Management, Loop Protection
	Upgrade & Restore	TFTP/HTTP for Configuration Import / Export TFTP/HTTP for firmware upgrade
	Diagnostic	Syslog, Level Info / Warning / Error Port Mirror, Per VLAN mirroring, CPU Load Monitor, Traffic Counter ICMP Ping
	DHCP	IEEE 802.1AS-2020 1-step
	Network Time	NTP client
	Synchronization System Status	Device info/status; Ethernet port status
	Green Ethernet	Port power savings
Dimensions	W x D x H	310 x 200 x 80 mm (12,2 x 7.87 x 3.15 inch) for 2404 variant 220 x 200 x 60 mm (8,66 x 7,87 x 2.36 inch) for 1202 variant
Mechanical	IP Level	IP65
	Cooling Method	Conduction cooled (through Cold Plate) or/and Natural convection
	Weight	~ 4 to 5 kg (~ 8.8 to 11 lbs) depending on build option
Power Supply Unit	Input Voltage	Wide range 18-36VDC, MIL-STD1275E compliant
	Power Consumption	approx. 30…40W (PoE consumption excluded)
	PoE	Compatible PoE+ (30W per ports), optional PoE++ version available - please contact Kontron for details
Indicators	Power Status	Power Good LED
	Ethernet Port	Link and Speed LED Bus
Temperature Range	Operating	-40 °C to +55 °C (70°C depending on build option - please contact Kontron)
	Storage	-40 °C to +85 °C
Certifications	Therm / Mech	MIL-STD810 (Optionally according DO-160)
	EMC/EMI	MIL-STD461(Optionally according DO-160)
	Others	CE, REACH / RoHS

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Ordering Information

Article	Part Number	Description
CERES-TSN-2404-140000	1080-1184	Fanless Rugged L2/L3 Switch – Microchip LAN969x TSN Switch Family › Memory: 1 GB DDR4 DRAM › Operating System: Microchip iStaX › Front I/O Interfaces: 24 x 1G Base-T Ethernet ports - 4 x 10G optical ports › PoE Support option : On 4 ports 1G base-T › 10G optical interfaces option: 4 x 10G Base-SR › Operating temperature: -40 °C to +55°C °C › Protection class: IP65 › Power Input: Wide range 18–36 VDC, compliant with MIL-STD-1275E
CERES-TSN-1202-120000	1080-1183	Fanless Rugged L2/L3 Switch – Microchip LAN969x TSN Switch Family › Memory: 1 GB DDR4 DRAM › Operating System: Microchip iStaX › Front I/O Interfaces: 12 x 1G Base-T Ethernet ports - 2 x 10G optical ports › PoE Support option : On 4 ports 1G base-T › 10G optical interfaces option: 2 x 10G Base-SR › Operating temperature: -40 °C to +55 °C › Protection class: IP65 › Power Input: Wide range 18–36 VDC, compliant with MIL-STD-1275E

Please ask sales.kfr@kontron.com for a specific configuration.

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More Information