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The Power of IoT

Kontron VX3124

High-Performance 3U VPX Computing Module

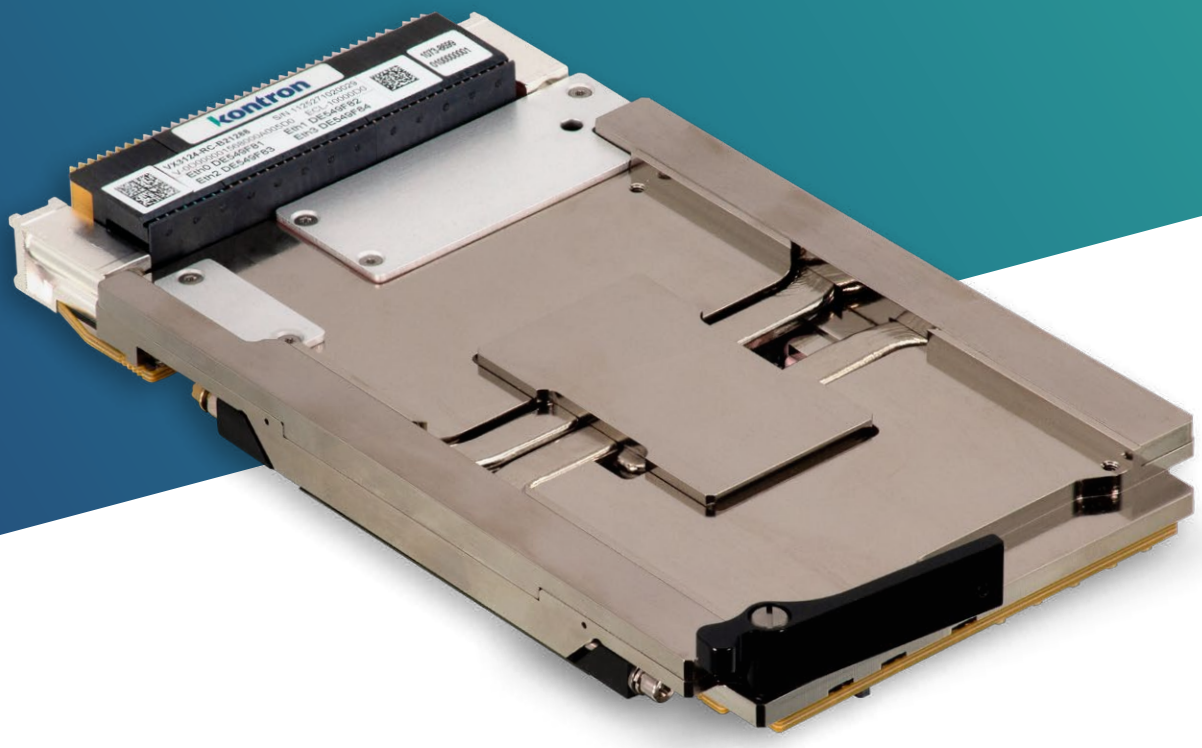
Powered by a 16-core Arm® Cortex®-A72 SoC, built for real-time embedded systems in defense, transportation, and industrial edge computing.
Its compact footprint, low power, and long lifecycle support make it ideal for mission-critical, SWaP-constrained environments.

16 CORE SoC

30 Watt Power

10+ Years

Real-Time ready



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3U VPX Computing Module

The **VX3124** is a high-performance **3U VPX processing module** powered by the **NXP LX2160A SoC**, integrating **16 Arm® Cortex®-A72 cores** clocked up to 2.0 GHz. It delivers exceptional compute density at just **30W typical power**, enabling fanless or mobile deployments where space and energy budgets are limited.

With soldered ECC DDR4, non-volatile storage, and secure boot architecture, the VX3124 is **ideal for resilient, real-time embedded systems in rugged and long-life programs**.

High-Density LX2160A Arm® Processing Architecture

Beyond its core count, the VX3124 leverages NXP's DPAA2 architecture to accelerate data-plane operations with up to 100 Gbps compression and 50 Gbps cryptography throughput. Combined with native 10 GbE support, integrated hardware switching, and multiple PCIe Gen3 and SATA interfaces, it's built to meet the demands of high-bandwidth, latency-sensitive systems across secure networking and real-time applications.

Optimized Memory and Storage

The board comes equipped with **16 GB DDR4 ECC SDRAM** (dual-channel, soldered) operating at 2400 MT/s for deterministic, high-bandwidth data throughput. It integrates **32 GB eMMC** non-volatile storage, dual Flash for boot and recovery, **dual EEPROMs** and a **1 Mbit FRAM** for persistent storage of mission-critical parameters during power loss.

Expansion and Storage Flexibility

A top-mounted **M.2 socket** (Type M, 22 x 42 mm) allows the integration of a SATA SSD module for additional high-speed local storage – ideal for data logging, video capture, or buffered compute pipelines.

Comprehensive I/O for Embedded Connectivity

Designed for integration into complex embedded systems, the VX3124 provides both front and backplane I/O to support a wide range of connectivity needs. It includes dual GbE, USB 2.0/3.0, and configurable serial ports on the front panel, while the backplane offers PCIe Gen3, 10G and 1G Ethernet, SATA, USB, serial interfaces, and IPMB-A/B for system management – ensuring smooth integration with legacy systems, sensor arrays, and high-speed accelerators.

VITA 65 Profile Compliance for Modular Integration

The VX3124 is fully compliant with VITA 65 slot and module profiles – SLT3-PAY-1F1F2U1TU1T1U1T-14.2.16 and MOD3-PAY-1F1F2U1TU1T1U1T-16.2.15-2 – ensuring seamless integration into VPX-based systems. Its alignment with modular open standards supports interoperability, multi-vendor configurations, and long-lifecycle embedded programs.

Software and Security

The VX3124 supports U-Boot and Yocto Linux natively, with additional OS options like VxWorks™ available on request. It features Secure Boot, Arm® TrustZone™, rollback protection – delivering a robust foundation for secure, flexible, and resilient embedded deployments.

Typical Applications

Defense & Aerospace

- Onboard mission processors for UAVs and ground vehicles
- Signal intelligence (SIGINT), radar, and electronic warfare processing nodes
- Secure tactical communication gateways

Edge Networking & Security

- Virtualized industrial firewalls or secure routers
- Multi-core real-time analytics at the edge

Transportation & Industrial

- Railway TCMS (Train Control & Monitoring Systems)
- Onboard video surveillance and edge analytics
- Smart infrastructure controllers with remote I/O

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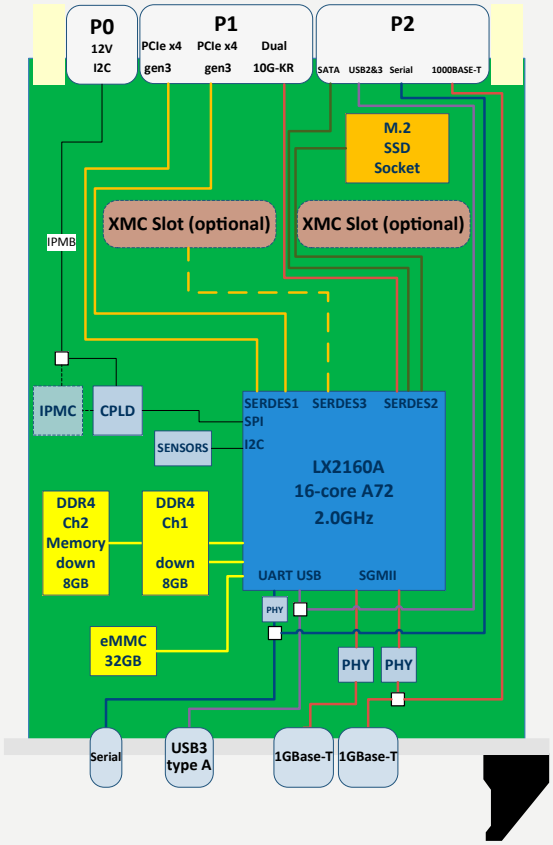
Block Diagram



3U VPX Computing Module

Technical Information

Form Factor		3U VPX, 5HP
Processor	System on Chip	NXP QorIQ® Layerscape® LX2160A SOC 16 Arm® v8 Cortex®-A72 processor core running up to 2GHz 30 Watts Power dissipation 28-nm silicon technology
Memory	System Memory	16 GByte dual channel DDR4 SDRAM running at 2600 MT/s, ECC, soldered
	OS Storage	32 GByte MLC 5.1 eMMC device
	Flash (UBoot)	2x 512 Mb serial NOR flash, with recovery image and UBoot settings
	EEPROM	One serial 256 Kbit EEPROM dedicated to system data One serial 256 Kbit EEPROM dedicated to application data
	F-RAM	1-Mbit, non-volatile, FRAM dedicated to the backup of critical data when the board is powered off
On-Board Controllers	Ethernet PHY	Two single port 10/100/1000BASE-T(X) Ethernet RGMII transceivers connected on front dual RJ45 connector
	Watchdog	PLD-based, timeout ranging from 4 ms to 510s, IRQ, Reset, dual-stages
	System CPLD	Power on/off control, reset control, local environmental control/ monitoring, I2C interfaces to I2C bus IPMB A/B (rear P0), LEDs control, user and system GPIOs, internal registers that allow system management
Front I/O	Ethernet	2 x 10/100/1000BASE-T(X) Ethernet interface on dual RJ45 connector
	USB 2 and 3	1 USB 2.0 and USB3.0 interface on USB type A upright connector
	Serial Line	1 TIA-232 serial line with handshaking or TIA-422/485 or 2 TIA-232 simplified on IEEE1394 type connector, depending on build option
	LEDs	5 LEDs reporting the board CPU health status and activity
	Reset	Reset push button
Backplane Connectivity	VPX Interface	SLT3-PAY-1F1F2U1TU1T1U1T-14.2.16 slot profile MOD3-PAY-1F1F2U1TU1T1U1T-16.2.15-2 module profile
	P0 Supervisory Functions	Non Maskable RESET NVMRO, Master SMBus and Master/Slave SMBus interfaces for system management, temperature and voltage sensors on the board PCIe optional use of common reference clock feature
	P0 Power Supply	P0: VS1=12V, 3.3V_AUX, -12V_AUX for XMC slot VS2 and VS3=5V not used
	P1	Data Plane: x4 PCIe Gen3 Expansion Plane: x4 PCIe Gen3 Control Planes: 2x 10GBASE-KR + 1x 1000BASE-T Maintenance port, GPIOs
	P2	IOs: 1x SATAIII, 1x USB2.0, 1x USB3.0, serial lines
Onboard Connectivity	M.2 Socket	Top M.2 socket for SATA SSD module. Supported size: Type M, 22 mm x 42 mm.
Software Support		Uboot, Linux available now. Ask for: VxWorks

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Environmental Specification

	SA-Standard Air Cooled	RC - Rugged Condition Cooled Version
Conformal Coating	Standard	Standard
Airflow	tbd	na.
Cooling Method	Convection	Conduction
Operating Temperature	0 °C to +55 °C	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C	-50 °C to +100 °C
Vibration Sine (operating)	20-2000 Hz - 2 g	20-2000 Hz - 5 g
Random	VITA 47-Class V1	VITA 47-Class V3
Shock (operating)	20 g/11 ms Half Sine	40 g/11 ms Half Sine
Altitude (operating)	-1.500 to 60.000 ft	-1.500 to 60.000 ft
Relative Humidity	95% without condensation	95% without condensation

Ordering Information

Article	Part Number	Description
V3124-RCFF-0000N10P	1075-1008	3U Single slot 5HP (1") VPX SBC › Rugged Conduction-Cooled 'RC-4' (-40°C to +85°C) conformal coating › LX2160A sixteen ARM A72 2.0GHz QorIQ LayerScape Procw essor › 16 GB soldered SDRAM with ECC › No 2LM covers › Soldered 32GB eMMC Flash › No XMC Mezzanine slot Rear module profile is MOD3-PAY-1F1F2U1TU1T1U1T-16.2.15-2: › x4 PCIe Gen3 Data Plane, x4 PCIe Gen3 Expansion Plane, dual 10GbE + 1GbE Control Planes › No front panel connectors › TPM 2.0 Secure Element › Power on Built in Test Run Time
V3124-SAFF-0000F10P	1075-1009	3U Single slot 5HP (1") VPX SBC › Air-Cooled 'SA' (0°C to 55°C) › LX2160A sixteen ARM A72 2.2GHz QorIQ LayerScape Processor › 16 GB soldered SDRAM with ECC › No 2LM covers › Soldered 32GB eMMC Flash › No XMC Mezzanine slot Rear module profile is MOD3-PAY-1F1F2U1TU1T1U1T-16.2.15-2: › x4 PCIe Gen3 Data Plane, x4 PCIe Gen3 Expansion Plane, dual 10GbE + 1GbE Control Planes › 1x USB3, 1x dual 1000BASE-T on RJ45 and 1x Serial line connectors on front panel › TPM 2.0 Secure Element - Power on Built in Test Run Time

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Ordering Information

PB-VX3-40G-602	1068-7010	3U single slot 5HP VPX RTM › Ethernet SFP+ cage, Ethernet 1000BASE-T interface › SATA III interface › Two serial COM interfaces › USB 3.0 / USB 2.0 ports › up to 8 GPIOs, mini DP interface, I2c bus connector, not coated

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More Information

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