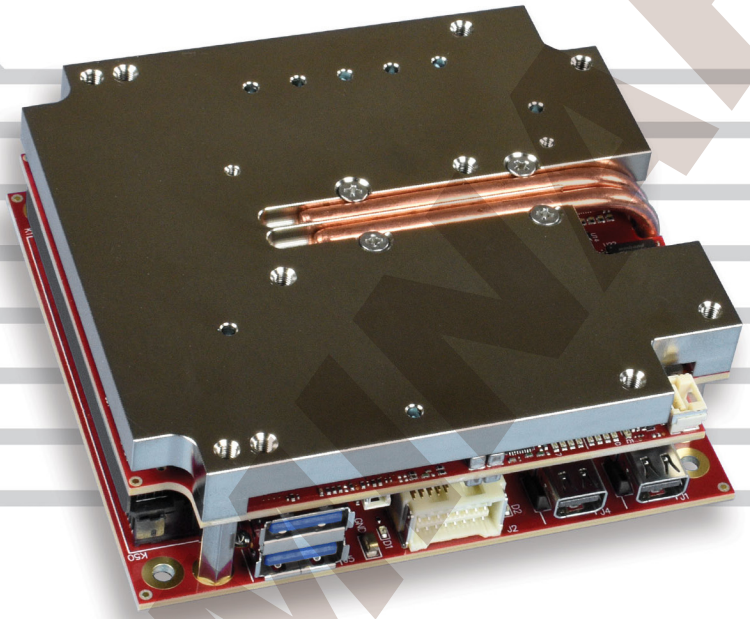
Eagle

Embedded Processing Unit



90 x 96 x 37 mm
(3.54 x 3.78 x 1.46")

Overview

The Eagle is a rugged board-level embedded computer that features a Xeon-E processor and soldered down NVMe SSD storage. It provides an ideal solution when high performance computing is required in extreme environments.

The Eagle is based on Intel®'s 9th Generation Xeon-E processor which features 6 cores and Hyper-Threading. In addition to the powerful processor it includes high speed SSD storage (NVMe) and up to 32 GB of error-correcting RAM. This makes it ideal for high performance embedded computing needs in defense, aerospace, medical, smart security, and energy applications.

The Eagle's high performance comes with a compact 90 x 96 mm footprint. Its 37 mm height fits in most 1U enclosures.

The Eagle is designed and tested for full industrial temperature (-40° to +85°C) operation and meets MIL-STD-202H specifications for shock and vibration. It uses latching connectors to address cable detachment issues in hostile environments.

VersaLogic's 10+ year product life support ensures long-term availability. Long lifecycle products avoid expensive upgrades, redesigns, and migrations that come from shorter lifecycle products.

Highlights PRELIMINARY

- **High Performance Processor**
  6-core Xeon-E
- **High Capacity On-board Storage**
  128 Gb NVMe fast read/write SSD storage
- **Error-Correcting Memory**
  Up to 32 GB of ECC RAM

VERSALOGIC CORPORATION

Features PRELIMINARY

1 High-performance Video

Intel UHD Graphics 630 supports DirectX 12 and OpenGL 4.5, 4K hardware video acceleration with HEVC (10-bit), VP8, VP9, and MPEG2 encoding/decoding and VC-1 decoding. Two Mini DisplayPort outputs.

2 Network

Two Gigabit Ethernet (GbE) ports.

3 Storage

On-Board fast read/write bootable 128 GB NVMe SSD. Larger capacities available.

6 Gb/s SATA port supports bootable SATA hard drive. Dual-port option available.

4 Industrial I/O

Two USB 3.1 ports (**4a**) and four USB 2.0 ports (**4b**) support video cameras, keyboard, mouse, and other devices.

Two RS-232/422/485 serial ports (**4c**). Three 8254 timer/counters. I2C support (**4d**).

5 Digital I/O

Eight TTL I/O Lines 3.3V. Independently configurable.

Intel Xeon Processor *(not shown)*

Hex-core with 4.2 GHz turbo clock rate.

RAM *(not shown)*

Up to 32 GB ECC DDR4 RAM depending on model.

Trusted Platform Module *(not shown)*

On-board TPM 2.0 security chip can lock out unauthorized hardware and software access.

Compact Size

90 x 96 mm

Industrial Temperature Operation

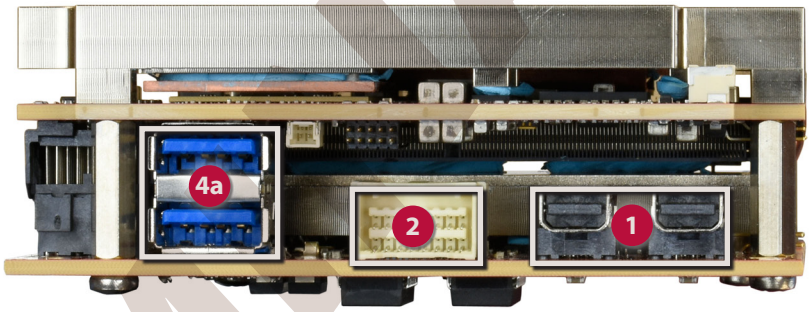
-40° to +85°C operation for harsh environments.

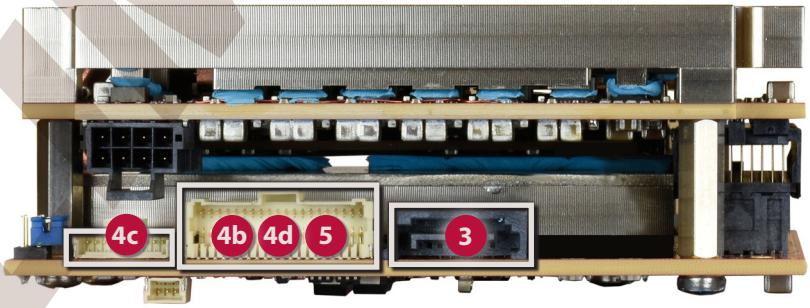
MIL-STD-202H

Qualified for high shock/vibration environments.

Software Support

Compatible with a variety of popular x86 operating systems including Windows, Linux, and Windows Server.





Modify Eagle to Your Exact Requirements

COTS modifications are available in quantities as low as 100 pieces.

- Conformal Coating
- Connector Changes
- I/O Changes
- Custom Testing
- Custom Labeling
- BGA Underfill
- BIOS Modifications
- Software and Drivers
- Revision Locks
- Custom Screening
- Storage Device Installation
- Software Pre-load
- Etc.

Specifications PRELIMINARY

General	
Board Size	90 x 96 x 37 mm (3.54 x 3.78 x 1.46"). PC/104 format mounting points.
Weight	476 grams (16.8 oz.)
Processor	Xeon E-2276ML 12 MB Cache, Intel 64-bit instructions, Secure Key, Intel Trusted Execution Technology, Intel Enhanced SpeedStep® Technology, Intel Turbo Boost Technology, Intel Virtualization Technology 2.0, AES New Instructions, Intel vPRO®.
Battery	Connection for 3.0V RTC backup battery

Power Requirements (@ +12V) †	*Model*	*Idle*	*Average*	*Max.*
	VL-EPU-5120-EDP-16X	4.2 W	26.1 W	48.0 W
	VL-EPU-5120-EDP-32X	4.2 W	26.7 W	49.2 W

Input Voltage	10V – 15VDC
System Reset and Hardware Monitors	All voltage rails monitored. Watchdog timer with programmable timeout. Push-button sleep, reset, and power.
Regulatory Compliance	RoHS (EU 2015/863), Conflict Minerals compliant.
Bus Expansion	None

Environmental				
Thermal Management	Bolt-on heat plate standard. Optional heat sink, fan, and other thermal accessories available.			
Operating Temperature	*Model*	*Heat Plate***	*Heat Pipe Adapter kit***	*Heat Sink + Fan*
	All models	-40° to +85°C	-40° to +85°C	-40° to +60°C
	Ranges shown assume 90% CPU utilization. For detailed thermal information and exceptions, refer to the VL-EPU-5120 Reference Manual. ** Heat plate must be kept below 80°C			
Airflow Requirements	0.5 linear m/s.			
Storage Temperature	-40° to +85°C			
Vibration, Sinusoidal Sweep ¤	MIL-STD-202H method MIL-STD-202-204, Condition A: 2g			
Vibration, Random ¤	MIL-STD-202H method MIL-STD-202-214, Condition A: 5.35g rms			
Mechanical Shock ¤	MIL-STD-202H method MIL-STD-202-213, Condition G: 20g half-sine			

Security	
TPM	Intel Trusted Platform Module 2.0 device

† Represents operation at +25°C and +12V supply running Windows 10 with DisplayPort display, GbE, and USB keyboard/mouse. Average power computed as the mean value of Idle and Maximum power specifications. Maximum power measured with 95% CPU utilization in Turbo mode.

◊ Derate -1.1°C per 305m (1,000 ft.) above 2,300m (7,500 ft.)

‡ TVS protected port (enhanced ESD protection)

§ Power pins on this port are overload protected

¥ Bootable storage device capability

¤ MIL-STD-202H shock and vibe levels are used to illustrate the extreme ruggedness of this product in general. Testing at higher levels and/or different types of shock or vibration methods can be accommodated per the specific requirements of the application. Contact VersaLogic Sales for further information.

Memory	
System RAM	16 or 32 GB ECC DDR4 SDRAM

Video	
General	Integrated Intel UHD Graphics 630 supports DirectX 12 and OpenGL 4.5, Quick Sync Video, Clear Video HD Technology, 4K
Hardware Based Acceleration	Video acceleration with HEVC (10-bit), VP8, VP9, and MPEG2 encoding/decoding and VC-1 decoding
DisplayPort Interface §	Two Mini DisplayPort++ outputs. 24-bit. Up to 4096 x 2304 at 60 Hz (30 Hz for Xeon model). 4K support at 60 Hz. Supports DisplayPort and HDMI signaling (Video and Audio outputs).

Mass Storage	
Rotating/SSD Drive ¥	SATA 6 Gb/s port. Latching SATA connector. (Dual non-latching connector available upon request.)
Flash/SSD Drive ¥	Soldered-down 128 GB NVMe. (Larger capacities available upon request.)

Network Interface	
Ethernet ‡	Two AutoDetect 10BaseT/100BaseTX/1000BaseT ports. Latching connector. One port with network boot-option.

Device I/O	
USB ‡§	Two USB 3.1 / 2.0 ports. Four USB 2.0 host ports.
COM Interface ‡	Two RS-232/422/485 selectable. 16C550 compatible. 1 Mbps max.
Digital I/O	Eight TTL I/O Lines 3.3V. Independently configurable.
I2C	Single I2C interface
Counter/Timers	Three 8254 compatible Programmable Interval Timers (PITs).

Software	
BIOS	UEFI
Sleep Mode	ACPI 3.0. Support for S0, S3, S4, S5 states.
Operating Systems	Compatible with most x86 operating systems including Windows, Linux, and Windows Server

Ordering Information PRELIMINARY

Call VersaLogic Sales at (503) 747-2261 for more information!

Model	Processor	Cores	Hyper-Threading / Threads	CPU Clock / Turbo Speed	Graphics Core	On-board Storage	Memory	Operating Temp.†	Cooling
VL-EPU-5120EDP-16X	Xeon-E-2276ML	6	Yes / 12	2.0 GHz / 4.2 GHz	UHD P630	128 GB NVMe SSD	16 GB ECC	-40° to +85°C	Heat Plate
VL-EPU-5120EDP-32X	Xeon-E-2276ML	6	Yes / 12	2.0 GHz / 4.2 GHz	UHD P630	128 GB NVMe SSD	32 GB ECC	-40° to +85°C	Heat Plate

† Final operating temperature is dependent on the customer thermal solution

Accessories PRELIMINARY

Part Number	Description
Cable Kit	
VL-CKR-EAGLE	Eagle Eval. cable kit. Includes VL-CBR-4005, 0812, 1604, 0702, 2033, 1014, 0818, HDW-105 and 401.
VL-CBR-4005	System I/O paddleboard
VL-CBR-0812	12" 8 pin Nanofit to Fork Terminal, 10-30V Power Cable
VL-CBR-0818	12" ATX 24-pin to 8-pin Molex Nano-Fit
VL-CBR-1604	Dual Ethernet cable, 16-pin Clik-Mate to 2 RJ-45 – rugged latching, 12"
VL-CBR-0702	SATA cable – rugged latching, 20"
VL-CBR-2033	Mini DisplayPort to HDMI Active Adapter
VL-CBR-1014	RS232 Dual channel cable 2xDsub (9-pin), Latching, 12"
VL-HDW-105	0.6" Standoff Package, metric thread
VL-HDW-401	Thermal compound paste. For heat sink attachment.
Cables and Adapters	
VL-CBR-0203	2-pin Latching Battery Module, 6"
VL-CBR-2031	miniDisplayPort to miniDisplayPort, 36"
VL-CBR-2032	Mini DisplayPort to VGA Adapter
Thermal Options	
VL-HDW-424	Heat Sink with Fan
VL-HDW-425	Heat Pipe Adapter Kit

Take the Risk out of Embedded Computing

Whether it's selecting the optimum solution for your application, providing expert support during development, or on-time delivery of defect-free products, VersaLogic is here to make sure your project goes smoothly from initial concept through the extended life of your program. Contact VersaLogic today to learn more.

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