Grizzly

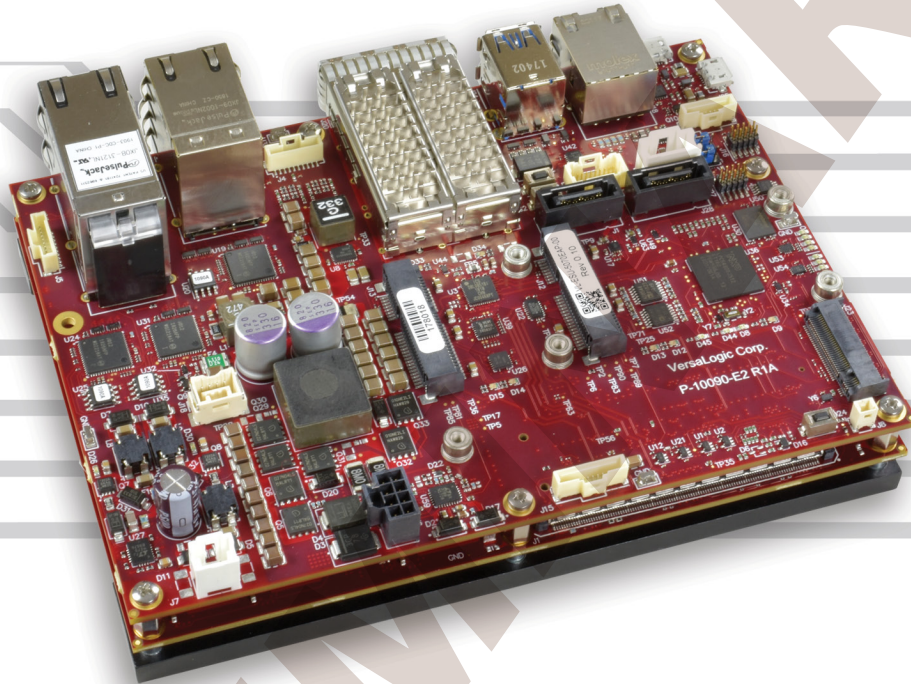## Embedded Server Unit

Overview

The Grizzly is a rugged embedded server unit (ESU) featuring an Intel 16-core processor, two 10 Gigabit Ethernet SFP+ ports, four Gigabit Ethernet ports, and up to 128 GB of ECC memory. This combination makes it ideal for applications requiring very high performance processing and high data bandwidth. Additionally, two Mini PCIe sockets and an M.2 site provide for on-board I/O expansion and high-capacity on-board storage. The Grizzly also contains additional interfaces including USB, serial and digital I/O, and SATA.

The high performance capability of the Grizzly make it ideal for situations where data gathering and processing need to be kept local for security or latency reasons, or to provide local cloud capability. A 16-core processor coupled with up to 128 GB of ECC memory supports the use of hypervisors for the running of virtual machines. The 10 Gigabit SFP+ ports permit very high speed connectivity. Networks can be created using plug-in copper, short-reach fiber, or long-reach fiber transceivers.

The Grizzly is based on the COM Express Extended form-factor, but it is delivered as an assembled and tested, production-ready embedded computer.

Highlights PRELIMINARY

- **Intel® 16-core server-class processor**
  Very high performance computing and I/O processing

- **-40° to +85°C Operation**
  Operates over full industrial temperature range

- **MIL-STD-202H Shock and vibration**
  Ideal for Mil/Aero and other challenging environments

- **Error correcting RAM safeguards critical applications**
  Four slots support up to 128 GB of ECC memory

- **Two 10 Gigabit Ethernet (SFP+)**
  Supports very high speed copper and fiber connections

- **Four 1 GbE Ports. Two with Power Over Ethernet (POE)**

- **Mini PCIe Sockets. Add GPS and other options**

- **On-board data storage**
  M.2 expansion site supports up to 2 TB of storage

- **Compact size. Only 110 x 155 mm (4.33 x 6.1")**

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Overview ...continued

Like all VersaLogic products, the Grizzly is engineered and tested to be rugged. It is fully validated for operation in unforgiving environments with extreme temperatures and mechanical shock and vibration. Each component has been carefully sourced, and the design optimized and validated, to ensure reliable operation in the field.

VersaLogic's 10+ year product life support programs ensure long-term deployment in the field, free from expensive upgrades and migrations that come from short, disposable lifecycle products. ■

Features PRELIMINARY

Intel Server-Class Processor (not shown)

2.0 GHz 16-core processor.

● **RAM** (not shown)

Up to 128 GB socketed ECC memory (Four SO-DIMM).

1 **10 Gigabit Ethernet**

Dual SFP+ cages supporting 10 GbE copper or fiber modules.

2 **Ethernet**

Dual 1 GbE ports with Power Over Ethernet (**2a**). Dual 1 GbE ports (**2b**).

3 **Serial I/O**

Two Host USB 3.0 (**3a**), console port via Serial over USB (**3b**).

4 **Digital I/O**

Fourteen 3.3V digital I/O lines.

5 **Storage**

M.2 expansion site. Add Terabytes of on-board data storage (**5a**).
Two 6 Gb/s SATA ports. Supports rotating or solid-state SATA drive (**5b**).

6 **Two Mini PCIe sockets**

One full-size + one half-size. Supports Wi-Fi modems, GPS receivers, flash data storage with auto-detect mSATA flash storage support, and other mini PCIe modules.

7 **On-board Power Conditioning**

10V to 30V input for standard 12V, 24V, and 28V power sources.
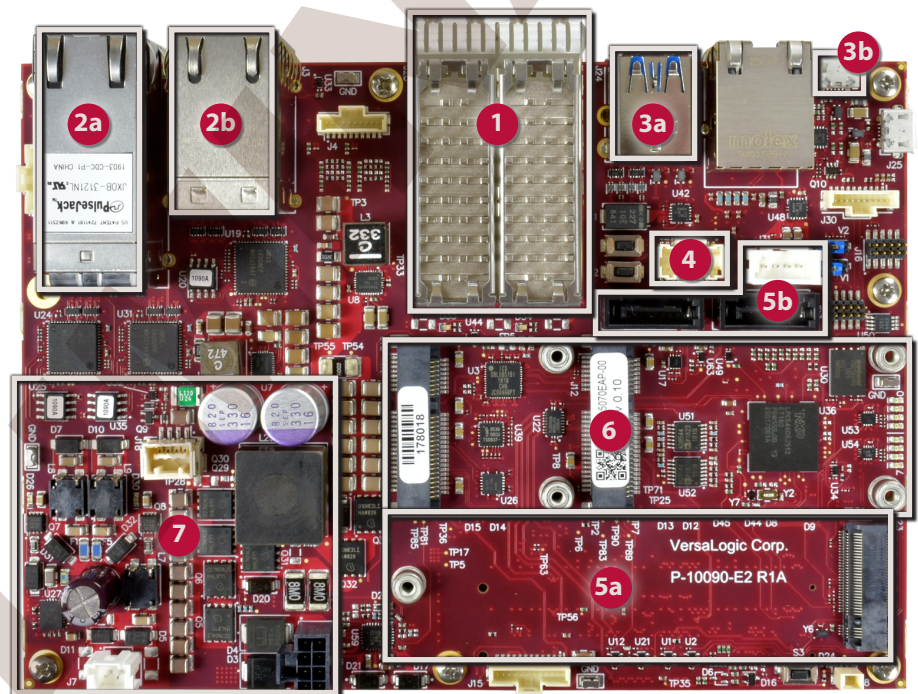
● **Industrial Temperature**

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

● **Standard Mounting**

COM Express Extended mounting holes. Only 110 x 155 mm (4.33 x 6.1").

● **MIL-STD-202H**

Qualified for high shock and vibration operation.

Modify Grizzly to Your Exact Requirements

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

- Conformal Coating
- Custom Cabling
- Connector & 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	COMe Extended Compliant: 110 x 155 mm (4.33 x 6.1"). 48.4 mm (1.9") tall with Heat Plate.
Weight	TBD grams (TBD oz.)
Processor	Intel C3958 (16-core) server-class processor. 16 MB cache. Supports Intel 64-bit instructions, AES Instructions, Secure Key, Execute Disable Bit, Secure Boot, Virtualization Technology, and Integrated QuickAssist Technology.
RTC Battery	Connector for external 3.0V RTC battery (Opt.).

Power Requirements (+12V) †	Model	Idle	Typical	Max.
	VL-ESU-5070ECP-32X	16 W	39 W	62W
	VL-ESU-5070ECP-48X	17 W	41 W	65W
	VL-ESU-5070ECP-64X	18 W	43 W	68W

Input Voltage	On-board power conditioning. 10V to 30V input. Accepts standard 12V, 24V, and 28V power input.
Board Management	Board Management Controller (BMC). Specified models only. - Out-of-band BMC connectivity via SFP+ 10 Gigabit Ethernet ports - Cold system power-up without a push-button - ESU reset, power on-off - Monitor and log thermal protection signals - Console port via serial over USB and 10/100 Ethernet port - Monitor major voltage rails and log out-of-bound conditions - High reliability watchdog - Power-up BMC self-test
Regulatory Compliance	RoHS (2011/65/EU), Conflict Mineral Free.

Environmental

Cooling Options	Heat Plate. Optional Heat Sink, Fan Sink, and thermo-electric cooler

Operating Temperature ◊	Model	Heat Plate**	Heat Sink	Fan Sink	Thermo-electric cooler with Fan Sink
	VL-ESU-5070ECP-32X	TBD	TBD	TBD	-40° to +85°C
	VL-ESU-5070ECP-48X	TBD	TBD	TBD	-40° to +85°C
	VL-ESU-5070ECP-64X	TBD	TBD	TBD	-40° to +85°C

	Range shown assumes 90% CPU utilization. For detailed thermal information, refer to the VL-ESU-5070 Reference Manual. ** Heat Plate must be kept below TBD°C
Airflow Requirements	Refer to the VL-ESU-5070 Reference Manual for detailed airflow requirements.
Storage Temperature	-40° to +85°C

Altitude	Operating*	To 4,570 m (15,000 ft.)
	Storage	To 12,000 m (40,000 ft.)

Thermal Shock	5°C/min. over operating temperature.
Humidity	Less than 95%, noncondensing
Vibration, Sinusoidal Sweep ¤	MIL-STD-202H, Method 204, Modified Condition A: 2g constant acceleration from 5 to 500 Hz, 20 min. per axis
Vibration, Random ¤	MIL-STD-202H, Method 214A, Condition A: 5.35g rms, 5 min. per axis
Mechanical Shock ¤	MIL-STD-202H, Method 213B, Condition G: 20g half-sine, 11 ms duration per axis

Memory

System RAM	Four SO-DIMM sockets. Up to 128 GB DDR4 (1.2V) ECC SDRAM.
Memory Speed	Up to 2400 MHz

Mass Storage

Rotating Drives / Flash / Solid-State Drives ¥	Two SATA (Revision 3.0) ports (data plus power). Latching connectors.
	mSATA module (SATA signaling, bootable).
	M.2 M-key and B & M-key 2280 socket. NVMe SSD compatible.

Network Interface

Ethernet‡	- Two SFP+ cages compatible with copper or fiber (SR and LR) 10 GbE modules. - Four autodetect 10BaseT/100BaseTX/1000BaseT ports (two with POE). - On-board status LEDs and external LED header. - IEEE 1588/802.1AS precision time synchronization supported.
Network Boot Option	Via on-board BIOS extension on one 10 GbE and one 1 GbE port.

Device I/O

USB‡ §	Two USB 3.0 host ports with Type A connectors.
Serial ‡	Console port via Serial over USB. Right angle USB 2.0 Micro B connector.
Digital I/O	Fourteen TTL I/O lines (3.3V). Independently configurable.

Other I/O

Mini PCIe/Sockets	One full-, one half-length Mini PCIe socket. Supports Wi-Fi modems, GPS receivers, non-volatile flash data storage with auto-detect mSATA support, and other plug-in modules.

Software

VersaAPI	VersaLogic Application Programming Interface to support on-board I/O devices.
Operating Systems	Compatible with most x86 server operating systems including Windows and VMWare.

† Represents operation at +25°C with +12V supply running Windows Server 2016. Typical power computed as the mean value of Idle and Maximum power specifications. One M.2 module and one SFP+ module installed. Maximum power is measured with 95% CPU utilization.

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

* For extended altitude information contact VersaLogic Sales

‡ TVS protected port (enhanced ESD protection)

§ Power pins on this port are overload protected

¥ Bootable storage device capability

¤ MIL-STD-202 shock and vibration 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.

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Ordering Information PRELIMINARY

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

| Model	Cores	Speed	Installed Memory**	Operating Temp.	Cooling
VL-ESU-5070ECP-32X	16	2.0 GHz	32 GB ECC	-40° to +85°C	Heat Plate
VL-ESU-5070ECP-48X	16	2.0 GHz	48 GB ECC	-40° to +85°C	Heat Plate
VL-ESU-5070ECP-64X	16	2.0 GHz	64 GB ECC	-40° to +85°C	Heat Plate

** Please contact VersaLogic Sales for memory options greater than 64 GB

Accessories PRELIMINARY

Part Number	Description
Cable Kit	
VL-CKR-GRIZZLY	ESU-5070 Grizzly Eval. Cable kit. Includes VL-CBR-0812, VL-CBR-0203, VL-CBR-2005, VL-CBR-0206
VL-CBR-0812	Power cable, 10 to 30V, high-power. 8 Pin Molex Nano-fit to wires. 12"
VL-CBR-0203	6" 2-pin Latching Battery Module
VL-CBR-2005	20-pin DIO Cable Assy, Cbl and Pdl Bd, RoHS
VL-CBR-0206	POE power cable, 2.00mm Pitch MicroClasp to wires. 12"
Cables	
VL-CBR-0407	SATA Power Cable 19.75"
VL-CBR-0503	USB 2.0 Male A to Male Micro-B Cable, 0.5 m
VL-CBR-0701	SATA cable, 19.75"
VL-SFPP1	SFP+ adapter. RJ45 10GB copper connection
Thermal Options	
VL-HDW-421	Fan Sink
VL-HDW-420	Heat Sink
VL-HDW-419	Active Thermal Solution comprising thermo-electric cooler and Fan Sink
Memory	
VL-MM11-8EBN	8 GB ECC SODIMM DDR4-2133, ET
VL-MM11-16EBN	16 GB ECC SODIMM DDR4-2133, ET
VL-MM11-32EBN	32 GB ECC SODIMM DDR4-2133, ET
Storage	
VL-F30-32EBN	32 GB NVMe SSD, M.2 2280, M Key PCIe, ET
VL-F30-64EBN	64 GB NVMe SSD, M.2 2280, M Key PCIe, ET
VL-F30-128EBN	128 GB NVMe SSD, M.2 2280, M Key PCIe, ET
VL-F31-xxEBN	2.5" solid state drive (SATA) ET
Hardware	
VL-HDW-111	Half- to Full-Size MiniPCIe Adapter kit. Metal adapter and 2x screws.

Expansion Modules

Part Number	Description	Form Factor
Network		
VL-MPEe-E3E	Gigabit Ethernet Adapter, (PCIe signaling)	Mini PCIe
VL-MPEe-E4E	Gigabit Ethernet Over Fiber Optic media (PCIe signaling)	Mini PCIe
VL-MPEe-E5E	Dual Gigabit Ethernet Adapter, (PCIe signaling)	Mini PCIe
VL-MPEe-FW1E	1394 Firewire Module, (PCIe signaling)	Mini PCIe
Serial I/O		
VL-MPEe-U2E	Quad serial plus twelve GPIOs	Mini PCIe
Analog & Digital I/O		
VL-MPEe-A1E	Analog Input Module, x8 channels, (12-bit resolution), (PCIe signaling)	Mini PCIe
VL-MPEe-A2E	Analog Input Module, x8 channels (16-bit resolution), (PCIe signaling)	Mini PCIe
GPS		
VL-MPEu-G2E	GPS Receiver, industrial temperature (USB signaling)	Mini PCIe
VL-MPEu-G3E	Precision GPS Receiver, industrial temperature (USB signaling)	Mini PCIe
Solid-State Storage (flash memory)		
VL-MPEs-F1Exx	4/16/32 GB mSATA drive, industrial temperature (SATA signaling)	Mini PCIe
Adapters		
VL-MPEs-S3E	SATA Adapter, industrial temperature (SATA signaling)	Mini PCIe
VL-MPEe-V5E	VGA/LVDS Interface (PCIe signaling)	Mini PCIe
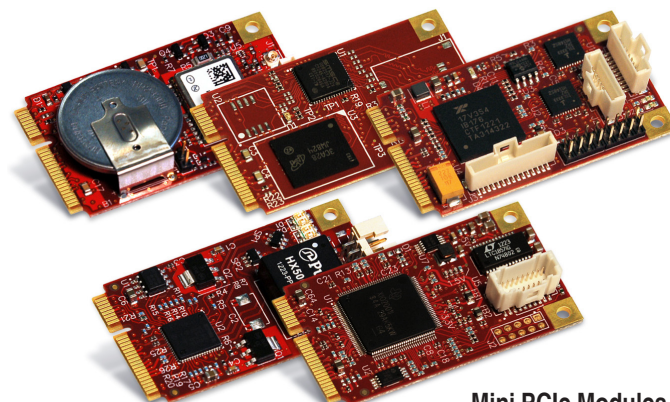
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Mini PCIe Modules