

VPA-200-VME Dual 7448 Single-Board Computer

Computing Performance and I/O Flexibility in a Single Slot

- Dual independent processing nodes for high-speed computation
- Rich I/O feature set
- Standard VME interface
- Dual PMC-X sites at up to 100 MHz
- Access to wide ecosystem with Linux® and VxWorks® support



The VPA-200-VME Dual 7448 Single-Board Computer (SBC) from Mercury Computer Systems is a versatile, full-featured 6U board that offers a higher level of computing power and bandwidth for users with high-density needs. The dual Freescale™ MPC7448 Power Architecture™ processors can be combined with a broad range of I/O options to deliver performance and flexibility to system designers. The VPA-200-VME is an air-cooled module available for deployment in both standard commercial environments and rugged systems.

Balanced Architecture

The VPA-200-VME architecture offers users an attractive balance between high-density processing and flexible I/O, allowing the VPA-200-VME to serve as an integral component in many different VME-based system architectures.

Dual Freescale MPC7448 processors provide the raw compute power necessary to service the most demanding embedded applications. Each 7448 processor runs at 1.4 GHz and is equipped with up to 1 GB of DDR SDRAM memory. The symmetric compute architecture allows for ease of programming, as well as an independent boot architecture for each processor.

Two standard PMC-X sites can be configured with off-the-shelf PCI mezzanine cards using either PCI or PCI-X protocols. User I/O is routed from the PMC J4 connector to the backplane per the VITA 35 standard. The Tundra® Tsi148™ VME bridge chip provides high-bandwidth VME 2eSST support, achieving high data transfer rates (greater than 200 MB/s) between 2eSST-capable modules in standard 5-row VME backplanes.

Each processing unit also features a front-panel Gigabit Ethernet interface. Additionally, the onboard processors are directly connected via a further two Gigabit Ethernet interfaces, which provide supplementary independent datapaths among processing subsystems.

Additional Resources

The VPA-200-VME provides the features expected from a typical SBC, including:

- Onboard real-time clock
- Internal counters/timers
- Flash and NVRAM for nonvolatile storage
- PCI-X interprocessor communication path
- Front panel RS-232 serial ports

Software Support

The board's support for either Linux® or VxWorks® operating systems gives it access to a wide ecosystem of stacks, middleware, libraries, and tools. Mercury's AltiVec™-optimized Scientific Algorithm Library (SAL) gives the VPA-200-VME industry-leading signal processing performance.

The VPA-200-VME can also be integrated into a RACE++® VME multicomputer as an MCOE™ AAA host when running the VxWorks® operating system. Added bandwidth to RACE++ processing modules can be achieved when the VPA-200-VME is configured with the Echotek™ Series RW++-PMC interface module.

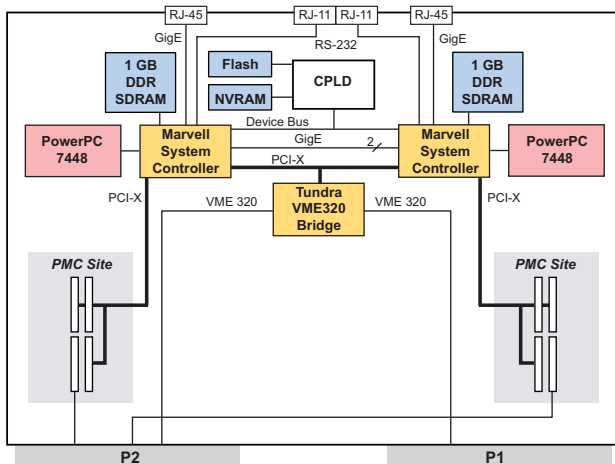


Figure 1. VPA-200 VME functional block diagram

System Configurations

The VPA-200-VME supports a variety of system configurations, including:

- Standalone SBC
- Loosely coupled compute cluster using Gigabit Ethernet and VME
- PMC-X intelligent carrier for VME systems
- Multicomputer AAA host for MCOE™ multicomputers based on RACE++

Preconfigured PMC Options

The VPA-200-VME has been tested by Mercury with a variety of PMC and PMC-X modules, providing features such as Gigabit Ethernet, Serial FPDP, Fibre Channel, A/D and D/A converters, FPGA processing, and RACE++ connectivity. It is also possible to contract with Mercury for integrated configurations including new or unique PMCs.

Specifications

Processor Nodes

Two independent processor nodes, each with:

Freescale MPC7448	Up to 1.4 GHz
Marvell® GT64460 bridge	167 MHz MPXbus
DDR-400 SDRAM, with optional ECC	Up to 1 GB

Inter-processor communication paths

- One PCI-X
- One or two Gigabit Ethernet

PMC-X Sites

Two PMC-X sites on independent PCI buses

Each connected to both a processor node and the fabric bridge/switch

Each user-configurable for 100-MHz PCI-X or 33/66-MHz PCI

- P14 pins 1-64 routed to VME P2
- P24 pins 1-45 routed to VME P2

I/O

VME320 through Tundra Tsi148

Two PMC-X sites

Two front-panel Gigabit Ethernet ports

Two front-panel asynchronous RS-232 serial ports

I²C interface (TWSI)

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Additional Resources

Onboard flash

StrataFlash® for TFFS or kernel storage	32 MB
Battery-backed NVRAM	32 KB
Boot flash	512 KB

CPLD on device bus

Demultiplexer for Marvell GT64460 device bus
General register set
Four internal timers
Interrupt routing for PMC-X site
Dual UART interface
ROMBUS flash interface

Marvell bridge resources (aggregate)

Two four-channel DMA controllers
Eight general-purpose 32-bit timer/counters
Doorbell and message interrupts between the processors and the PCI buses

Real-time clock

Electrical/Mechanical

Input voltage 5V and 3.3V

Power (Without PMCs) 55W

Physical

Form factor 6U

Dimensions

Length	9.19 in (23.3 cm)
Width	6.30 in (16.0 cm)

Weight (without PMCs) 1.721 lb (0.781 kg)

Environmental

	Standard commercial	Level 1 rugged
Temperature		
Operating	0°C to 40°C	-25°C to +55°C
Storage	-40°C to +85°C	-55°C to +85°C
(Inlet air temperature at recommended minimum airflow)		
Recommended minimum airflow (per slot)	10 CFM	Consult factory (dependent on PMC configuration)
Altitude		
Operating	0-10,000 ft	0-30,000 ft
Storage	0-30,000 ft	0-50,000 ft
Relative humidity	10-90% (non-condensing)	5-95% (non-condensing)



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