The MVME2400 series of VME boards provides the performance of Motorola’s PowerPlus II Architecture and the ability to be fully customized to satisfy your application needs with two PCI Mezzanine Cards (PMCs). The flexibility of the MVME2400 provides an excellent base platform that can be quickly and easily customized for a variety of industry-specific applications.

Utilizing Motorola’s low-power, high-performance PowerPC 750 microprocessors, the Peripheral Component Interconnect (PCI) bus for the on-board peripherals, processor/memory bus to PCI bus bridge, and a VME interface, the MVME2400 processor modules pack optimum levels of flexibility and performance into a single VME slot.
IEEE P1386.1 Compliant PMC Slots
The MVME2400 features dual PMC ports with support for both front-panel and P2 I/O. P2 I/O-based PMCs which follow the PMC committee recommendation for PCI I/O when using the VME64 extension connector will be pin-out compatible with the MVME2400.

In addition to providing high-performance expansion I/O, the IEEE P1386.1 compliant PMC ports form a common architecture for future generations of products. Changing I/O requirements can be satisfied by simply replacing PMCs while reusing the same base platform, reducing the long-term cost of ownership.

VME64 Extension Connector
To maximize the capabilities of the MVME2400, 5-row 160-pin DIN connectors replace the 3-row 96-pin connectors historically used on VME for P1 and P2. Two rows, Z and D, have been added to the VME P1/J1 and P2/J2 connectors providing a user with additional I/O. The VME64 extension connector is 100% backward compatible with existing VME card systems.

PowerPlus Architecture
A second-generation architecture, PowerPlus II Architecture is a processor and bus architecture fully optimized to get the maximum performance from the PowerPC microprocessor family, the PCI bus, and the VMEbus. Features added to the original PowerPlus Architecture include support for 100 MHz local bus operation, and utilization of synchronous DRAM (SDRAM) technology. The outstanding performance of VME processor boards based on the PowerPlus II Architecture is not due to a single factor. A number of elements in the design of the PowerPlus II Architecture contribute to its outstanding performance including the Processor/Memory subsystem, high-speed local bus, optimally decoupled architecture, decoupling the processor from PCI, and the advanced VME interface which reduces PCI delays.
Specifications

Processor
- Microprocessor: MPC750
- Clock Frequency: 233 MHz, 350 MHz, 450 MHz
- On-chip Cache (I/D): 32KB/32KB, 32KB/32KB, 32KB/32KB
- SPECint95, estimated: 10.2, 15.4, TBD
- SPECfp95, estimated: 8.2, 10.5, TBD

Memory
- ECC Protected Main Memory: PC100 SDRAM with 100 MHz bus
- Capacity: 32MB to 512MB
- Single Cycle Accesses: 10 read/5 write
- Read Burst Mode: 7-1-1-1 idle; 2-1-1-1 aligned page hit
- Write Burst Mode: 4-1-1-1 idle; 2-1-1-1 aligned page hit
- Architecture: 64-bit, single interleave
- L2 Cache: 1MB
- Cache Bus Clock Frequency: 116.67 MHz (233 MHz processor), 140 MHz (350 MHz processor), 180 MHz (450 MHz processor)
- EEPROM/Flash: On-board programmable
- Capacity: 1MB via two 32-pin PLCC/CLCC sockets; 8MB surface mount
- Read Access (8MB port): 70 Clocks (32 byte burst)
- Read Access (1MB port): 262 Clocks (32 byte burst)
- NVRAM: 8KB; 4KB available for users
- Cell Storage Life: 50 years at 55° C
- Cell Capacity Life: 10 years at 100% duty cycle
- Removable Battery: Yes

VMEbus ANSI/VITA 1-1994 VME64 (IEEE STD 1014)
- Controller: Tundra Universe 2.0
- DTB Master: A16–A32; D08–D64, BLT
- DTB Slave: A24–A32; D08–D64, BLT, UAT
- Arbiter: RR/PRI
- Interrupt Handler/Generator: IRQ 1–7/Any one of seven IRQs
- System Controller: Yes, jumperable or auto detect
- Location Monitor: Two, LMA32

Ethernet Interface
- Controller: DEC 21143
- PCI Local bus DMA: Yes
- Connector: Routed to front panel via an RJ-45

Asynchronous Serial Port
- Controller: W83C553
- Number of Ports: One, 16550 compatible
- Configuration: EIA-574 DTE
- Async Baud Rate, bps max.: 38.4K EIA-232, 115Kbps raw

Counters/Timers
- TOD Clock Device: M48T559; 8KB NVRAM
- Real-Time Timers/Counters: One 16-bit, four 32-bit programmable
- Watchdog Timer: Time-out generates reset

IEEE P1386.1 PCI Mezzanine Card Slot
- Address/Data: A32/D32/D64, PMC PN1, PN2, PN3, PN4 connectors
- PCI Bus Clock: 33 MHz
- Signaling: 5V
- Power: +3.3V, +5V, ±12V, 7.5 watts maximum per PMC slot
- Module Types: One double-wide or two single-wide front-panel I/O or P2 I/O

Note: P2 I/O from PMC slot 2 is only accessible to systems equipped for VME64 extension connectors

PCI Expansion Connector
- Address/Data: A32/D32/D64
- PCI Bus Clock: 33 MHz
- Signaling: 5V
- Connector: 114-pin connector located on the planar of the MVME2400

Power Requirements
- + 5V ±5%
- MVME2400 w/ MPC750 @ 233 MHz: 4.5 A typ., 5.5 A max.
- MVME2400 w/ MPC750 @ 350 MHz: 4.5 A typ., 5.5 A max.
- MVME2400 w/ MPC750 @ 450 MHz: 3.93 A typ., 4.31 A max.

Note: Power requirements are PMC dependent at +12 and –12 volts.

Board Size
- Height: 233.4 mm (9.2 in.)
- Depth: 160.0 mm (6.3 in.)
- Front Panel Height: 261.8 mm (10.3 in.)
- Width: 19.8 mm (0.8 in.)
- Max. Component Height: 14.8 mm (0.58 in.)

Demonstrated MTBF
(based on a sample of eight boards in accelerated stress environment)
- Mean: 190,509 hours
- 95% Confidence: 107,681 hours

Environmental
- Temperature: Operating 0° C to +55° C, Nonoperating –40° C to +70° C
- Humidity (NC): Operating 5% to 85%, Nonoperating 5% to 95%
- Vibration: Operating 1 G Sine Sweep 5–100 Hz, Nonoperating 0.5 G Sine Sweep 5–50 Hz; 3 G Sine Sweep 50–500 Hz
## Safety
All printed wiring boards (PWBs) are manufactured with a flammability rating of 94V-0 by UL recognized manufacturers.

## Electromagnetic Compatibility (EMC)
Intended for use in systems meeting the following regulations:
- **U.S.:** FCC Part 15, Subpart B, Class A
- **Canada:** ICES-003, Class A

This product was tested in a representative system to the following standards:
- CE Mark per European EMC Directive 89/336/EEC with Amendments;
- Emissions: EN55022 Class B;
- Immunity: EN50082-1

## Software Support
The MVME2400 is supported by a variety of operating systems, including a complete range of real-time operating systems and kernels.

## Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVME2401-1</td>
<td>233 MHz MPC750, 32MB ECC SDRAM, Scanbe handle</td>
</tr>
<tr>
<td>MVME2401-3</td>
<td>233 MHz MPC750, 64MB ECC SDRAM, IEE handle</td>
</tr>
<tr>
<td>MVME2403-1</td>
<td>233 MHz MPC750, 32MB ECC SDRAM Scanbe handle</td>
</tr>
<tr>
<td>MVME2403-3</td>
<td>233 MHz MPC750, 64MB ECC SDRAM, IEE handle</td>
</tr>
<tr>
<td>MVME2431-1</td>
<td>350 MHz MPC750, 32MB ECC SDRAM, Scanbe handle</td>
</tr>
<tr>
<td>MVME2431-3</td>
<td>350 MHz MPC750, 64MB ECC SDRAM, IEE handle</td>
</tr>
<tr>
<td>MVME2432-1</td>
<td>350 MHz MPC750, 64MB ECC SDRAM, Scanbe handle</td>
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<tr>
<td>MVME2432-3</td>
<td>350 MHz MPC750, 64MB ECC SDRAM, IEE handle</td>
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<td>MVME2433-1</td>
<td>350 MHz MPC750, 128MB ECC SDRAM, Scanbe handle</td>
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<tr>
<td>MVME2433-3</td>
<td>350 MHz MPC750, 128MB ECC SDRAM, IEE handle</td>
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<tr>
<td>MVME2434-1</td>
<td>350 MHz MPC750, 256MB ECC SDRAM, Scanbe handle</td>
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<tr>
<td>MVME2434-3</td>
<td>350 MHz MPC750, 256MB ECC SDRAM, IEE handle</td>
</tr>
<tr>
<td>MVME2400-0321</td>
<td>450 MHz MPC750, 32MB ECC SDRAM, Scanbe handle</td>
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<td>MVME2400-0331</td>
<td>450 MHz MPC750, 64MB ECC SDRAM, Scanbe handle</td>
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<td>450 MHz MPC750, 512MB ECC SDRAM, IEE handle</td>
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</table>

## Related Products
- **PMCSpan-002** Primary PCI expansion, mates directly to the MVME2400 providing slots for either two single-wide or one double-wide IEEE P1386.1 compliant PMC cards; optional PMCSpan-010
- **PMCSpan(1)-002** PMCSpan-002 with original VMEbus Scanbe handles
- **PMCSpan-010** Secondary PCI expansion, plugs directly into PMCSpan-002 providing two additional PMC slots
- **PMCSpan(1)-010** PMCSpan-010 with original VMEbus Scanbe handles
- **MPMC** Motorola’s family of PMC modules; ask your sales representative for details

## Documentation
- **V2400A/1H** MVME2400 Installation and Use
- **V2400A/PG** MVME2400 Programmer’s Reference Guide
- **PMCSpanA/1H** PMCSpan Installation and Use
- **PPCDAIA/UM** Firmware Diagnostics Manual

Notes on Ordering Information
1. Board support package source and object modules available upon request.