# BVME4500

68040 3U CPU with Ethernet

- 33MHz CPU clock

- 4096 byte data and instruction caches

- 32-bit wide burst fill dual ported memory interface with Bus Snooping

- Extensive choice of memory options via expansion interface:
    16Mbytes of FLASH EPROM
    96Mbytes DRAM

- 2Mbyte 32bit wide BOOT Sector Flash EPROM

- 2Mbytes 32bit wide Non-Volatile SRAM

- 2Kbits EPROM

- DMA driven Ethernet via AUI connector (10baseT)

- Two Interrupt driven RS232 ports

- Real Time Clock with battery backup

- 2 16bit timers

- Optimized master/slave VMEbus interface A24, A16: D16,D08

- Location monitor - Mailbox Interrupts

- Single Level Arbiter (SGL)

- Expandable via Memory/OEM interface bus

- Single slot 3U form factor (dual slot with full memory option)

- VxWorks and OS-9 BSPs available

- VMEbus rev C.1 compatible

The BVME4500 is a 3U MC68040 VMEbus processor module combining a wide selection of memory options with two Serial I/O channels and an Ethernet Port. It provides a good level of performance in applications where space is limited and its compact design and extended specification option makes it ideally suited to more hostile environments.
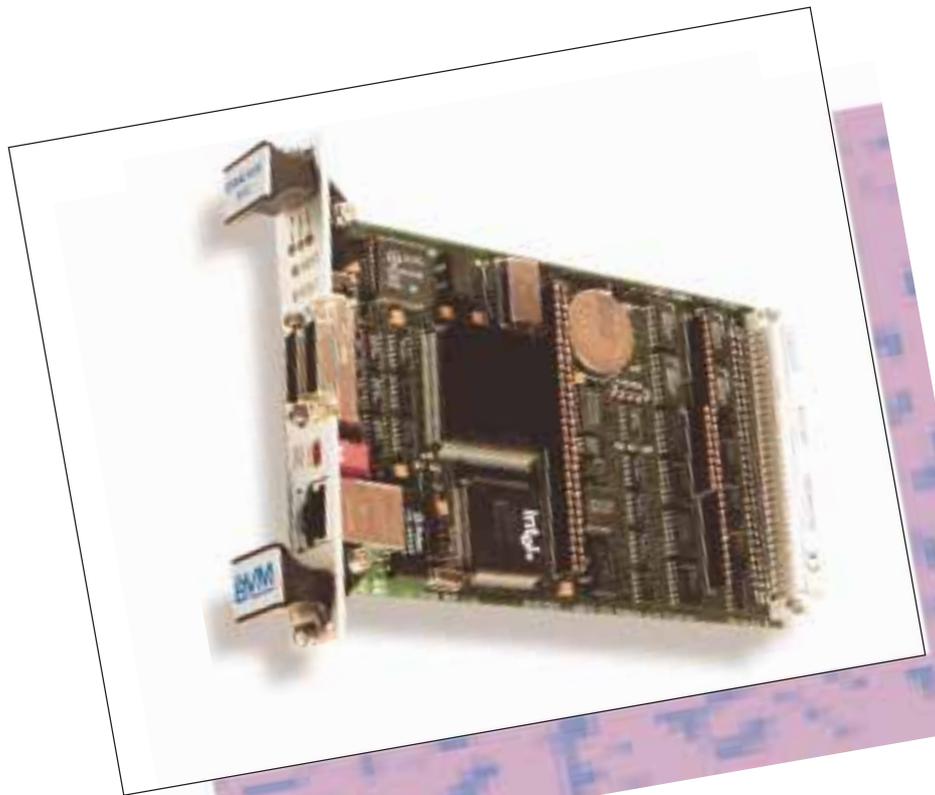
The 33Mhz 68040 processor is supported by 2Mbyte of 32bit wide SRAM and 2Mbytes of 32bit wide Boot Sector Flash on-board with the ability to accept up to two of BVM's standard memory expansion modules giving capacities of up to 96Mbytes of DRAM and 8Mbytes of Flash. All memory can be dual ported to the VMEbus.

The BVME4500 provides two RS232 serial ports and a 10baseT Ethernet port all available through the front panel. It is available in standard commercial specification or extended specification for more extreme environments.

BVM

Processor

The BVME4500 is fitted with a 33MHz MC68040 Processor. This provides a 68030 compatible integer processor combined with an IEE754 compatible floating point unit (FPU). In addition two fully independent data and instruction Paged demand page memory management units (MMU's) and two independent 4Kbyte caches provide effective bus interface with a high degree of instruction execution parallelism. The BVME4500 uses a QFP package to reduce board space and ensure maximum reliability.

Memory

FLASH EPROM

2Mbytes of Boot Sector FLASH Memory. The boot section is programmed via the VMEbus, a switch in the front panel enables Boot Block programming. The Flash is 32bit wide and supports byte, word and longword accesses.

Non Volatile RAM

2Mbyte of battery backed 32bit wide SRAM dual ported to the VMEbus provides non-volatile storage.

Main Memory

The BVME4500 supports the BVME4000/6000 standard memory module bus and can therefore be fitted with one or two modules. The current range of BVM memory modules allows up to 96MBytes DRAM and an additional 16MBytes Flash.

EEPROM

The BVME4500 supports an I2C Compatible EEPROM, the PROM is accessed in logic registers to simulate the BVME4000. This offers 256bytes of non-volatile storage.

Serial Communications

Two serial communication interfaces are provided from a Z85230 SCC device. The 85230 provides two fixed RS232 channels providing asynchronous baud rates up to 76.8Kbaud. Access is via 2 26 way Micro D connectors mounted through the front panel.

Ethernet Interface

The Ethernet interface is provided built around the Intel 82596CA. This provides a 32bit DMA driven interface to 10BaseT Ethernet accessed via an RJ45 mounted on the front panel. The 32-bit DMA driven interface allows direct access to the entire BVME4500 memory allowing full packet management by the 85296.

VMEbus System Control

Full system controller functions are provided including a Single Level Arbiter and generation of RESET, SYSCLK and Bus timeout BERR.

Bus Master

A24/A16 : D16/D8 Programmable interrupt handler.

Bus Slave

A24 : D16/D8 All Memory locations Dual Ported onto the VMEbus.

Interrupter

Generates vectored interrupt on one of seven software selectable levels.

Loc Monitor Generates local Interrupt if specific VMEbus location is accessed.

Power Supply Monitor

A MAX791 is used to perform the Power monitoring function including the non-volatile RAM housekeeping.

Switches

Reset and Abort switches are mounted behind the front panel to remove the threat of accidental access. The Reset switch is controlled by the MAX791 to generate a CPU Reset , while Abort will provide an autovectored level 7 interrupt.

Watchdog

The MAX791 provides a watchdog capability such that if enabled, the processor will be Reset if the software fails to maintain the pulse to the watchdog circuit.

RTC

The Real-time Clock is provided using the DP8570. The device offers battery backed date and time maintenance, two 16 bit periodic timers with interrupt and a small amount of non-volatile storage. The backup source is shared with the SRAM.

LED Indicators

The BVME4500 has 3 LED indicators. The Green LED indicates the processor is running valid code, the Red LED indicates external accesses and the yellow LED indicates Ethernet Traffic.

Configuration Switch

The BVME4500 has two configuration switches. SW1 has no specific task but can be used by software to set the board configuration. SW2 is used to enable Flash Boot programming over the VMEbus.

Software Support

Board Support Packs (BSPs) for both VxWorks and OS-9 Operating Systems are available. Wherever possible the BVME4500 is designed to be directly compatible with the BVME4000 and BVME6000 families of SBC allowing easy migration of application between systems.
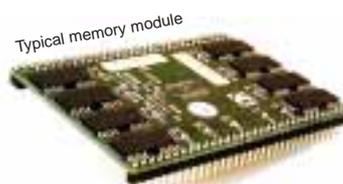
Typical memory module

Specification

CPU
    MC68040 @ 33MHz containing FPU, MMU, 4096byte data & instruction Cache
Memory Module Interface
    32bit wide burst fill dual-ported with Bus Snooping, no capacity limitations allowing many options using MEM390, MEM400, MEM480 memory modules 2Mbytes of 32bit wide Boot sector FLASH. Boot area programmable over the VMEbus.
2Mbyte 32bit wide Non Volatile (battery backed) dual-ported SRAM
    256byte EEPROM for configuration settings
Configuration Switch
    SW1 for software configurations
    SW2 for Flash programming
Indication LED's
    CPU RUN, External Ethernet Traffic
Real Time Clock
    (battery backed) including Tick Timer, 2 16bit timers and non-volatile configuration RAM (DP8570)
Ethernet
    High Performance DMA driven 10BaseT Ethernet (82596CA)
Serial Ports
    Two Interrupt driven Serial I/O Ports capable of 76.8Kbaud RS232 (Z85230).
VMEbus interface
    Optimised A24/D16/D08 master/slave
    VMEbus Interrupter
    VMEbus Interrupt handler
    Location monitor - Mailbox Interrupt
VMEbus System Controller Functions
    ARBITER:SGL,FAIR ROR (RWD option)
    SYSCLK Driver
    SYSRESET Driver/Monitor power-up and switch
    VMEbus RESET min period=200mS
    BUS TIMEOUT period 128uS
    BUS ERROR monitor
    ACFAIL monitor (level 7 auto-vectored interrupt).
VMEbus Interrupts
    Interrupter D08(O) ROAK:
    I(107) single level, S/W programmable Interupt vector ID, S/W programmable Interrupt handler D08(O):
    I(1-7) all levels, software maskable.
Dimensions
    100mm x 160mm (3U) single slot
Power
    +5v 2.3A (max), +12V 0mA, -12V 0mA
Environmental
    0 - 70°C, 95% humidity non-condensing (extended range to order).

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