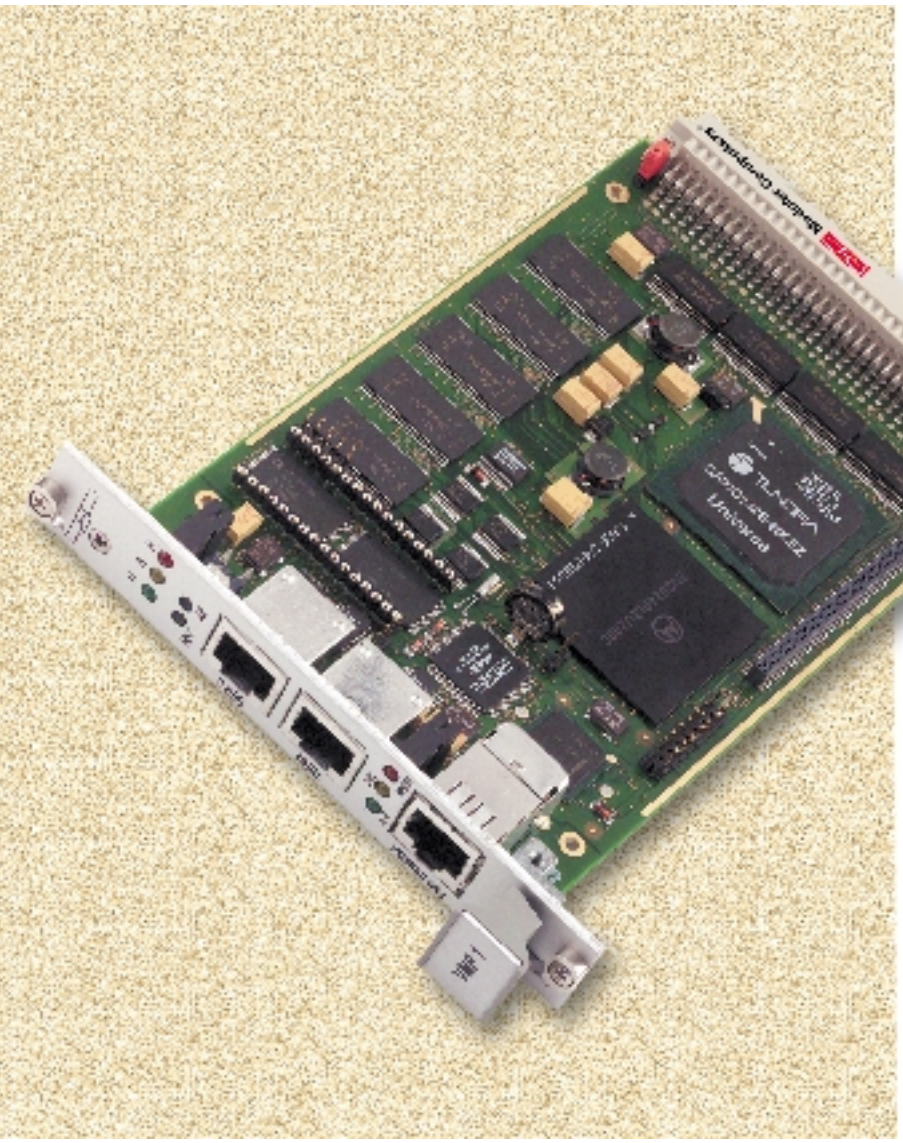
HIGH-
PERFORMANCE
CPUs
SINGLE-BOARD
COMPUTERS

VMP1

VME Processor Module



Computing in rugged environment

- Integrated PowerPC MPC8240 with internal MPC603e core
- VME64 industry standard interface
- PCI local bus 33 MHz
- PCI Expansion Connector
- Up to 128 MB SDRAM/100 MHz
- Up to 8MB Flash
- Optional Flash disk or NVSRAM
- Fast Ethernet
- Two RS232 ports
- Rugged 3U design
- Extended temperature version
- Universal Boot Loader

A well-balanced design achieving a maximum of computer performance versus power dissipation, realized using the highly integrated MPC8240 PowerPC, embedded in a rugged design.

CERTIFIED
DIN ISO 9001
QUALITY SYSTEM
Reg. No. 0548 - 02

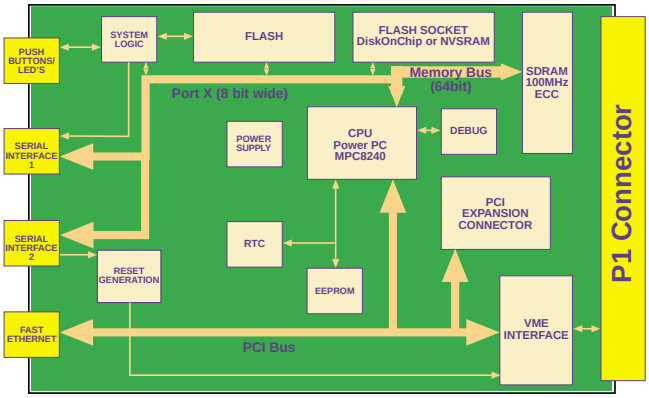
Modular Computers®

HIGH-PERFORMANCE CPUs SINGLE-BOARD COMPUTERS

Product Overview

VMP1

PEP's VME PowerPC Processor board with Floating point unit based on the MPC8240 is a straight forward computing design.



CPU, Memory and DMA

The VMP1 is a comprehensive computing platform realized as a lean CPU design with only those functions required for basic industrial calculation tasks. It addresses the need for increasing computing capacity while reducing the number of system components and taking up less space. Based on the MPC8240, a highly integrated microprocessor containing a PowerPC MPC603e core, two different clock versions, 200 MHz and 266 MHz, both with an FPU unit will be initially available.
Anticipating the VMP1's use in data critical applications, the memory data path contains a selectable in-line ECC controller which can provide SDRAM single bit error correct or double bit error detect.
For mass data transmission a dual channel DMA controller is provided. It can be programmed directly or through the use of descriptor chains located in memory. Data can thus be moved from PCI to memory or vice versa, memory to memory, or PCI to PCI.

PCI bus and PCI Expansion capability

PCI is used as the local bus to connect the MPC8240 with the Fast Ethernet controller and the PCI/VME bridge. Moreover, it is routed to a 100 pin PCI expansion connector that can be used to add further functionality to the VMP1. One or two VMP1-IO modules can be plugged together with the VMP1 (e.g. two PMC slots can be added) resulting in a total package of either 8HP or 12HP.

VME interface

The VMEbus interface (Universe 2) delivers beside all functionality that is needed by a VME CPU:
– automatic First-Slot-Detection
– integral FIFO buffers for multiple transactions in both directions
– programmable DMA controller with linked list support.

LAN

The i82559 10/100 Mbps Fast Ethernet controller with an integrated 10/100 Mbps physical layer device is the foremost solution for PCI board LAN designs. It combines a low power consumption with a small package design which is ideal for power and space constrained environments.

Serial ports

Two RS232 serial ports are realized with the 16C2550 UART and supports baud rates up to 1.5Mbps.

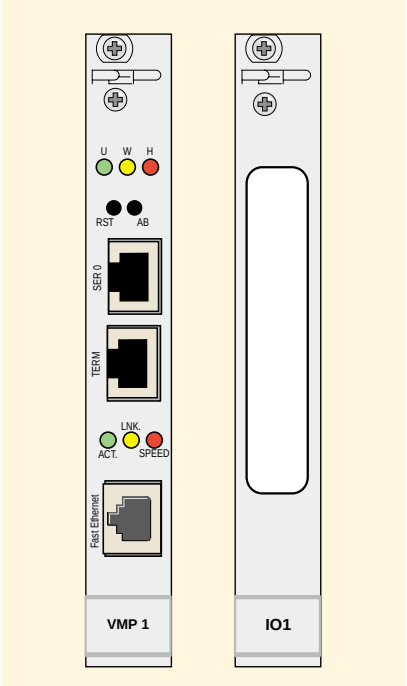
Support

One of the prime advantages of utilizing the existing, time-tested, and proven MPC603e core is the legacy and infrastructure of support that currently exists. All notable third-party software tool vendors presently endorsing the PowerPC architecture have announced tools also for the MPC8240. It supports processor control and visibility through the JTAG/COP (common on-chip processor) interface that is accessible on VMP1. Utilizing third party tools, the developer can access and control the processor. It also has standard IEEE 1149.1a-1993 compliant boundary scan capability. The ECC data path has a mechanism to manually inject errors into memory for use with maintenance and diagnostic utilities. Further a watch point and capture register on the internal bus as well as a set of address attributes on the external memory and PCI buses aid in debugging analysis.

Universal Boot Loader

The VMP1 employs an operating system independent boot loader that enables the loading of any OS. This boot loader makes an update of the Flash contents and accomplishes an automatic download from Flash to SDRAM before booting the OS. For high performance reasons the OS is started from the SDRAM.

Front-Panel VMP1



Specifications

VMP1

Processor

Integrated PowerPC microprocessor
Motorola MPC8240
L1 cache 2 x 16 kB data/instruction cache;
Internal processor core MPC603e
Core Frequency 200 MHz or 250 MHz
6.6 SPECint95
5.5 SPECfp95
375 Dhrystone (2.1) MIPS

PCI bridge and PCI arbiter
Two channel controller DMA with chaining
Programmable IRQ controller
Multiple timers and counters

Memory

Up to 128 MB direct soldered SDRAM/64 bit/100 MHz with ECC protection (8 bit parity)
Up to 8MB direct soldered Flash (Boot Device and Program Storage)
DIL Socket for:

- NV-SRAM (up to 512 kB)/Cell Storage Life 10 years
- Flash DiskOnChip (up to 144 MB)

Front I/O

- Fast Ethernet Channel 10 Base-T/100 Base-TX; RJ-45;
  LAN Status LED's (Activity, Link, Speed)
  integrated IEEE 802.3 10 BASE-T and 100 BASE-TX compatible PHY
  integrated power management functions
  dynamic transmit chaining with multiple priorities transmit queues
  full duplex support at both 10 and 100 Mbps operation
  IEEE 802.3u Auto-Negotiation support
  3 Kbyte Transmit FIFO and 3 Kbyte Receive FIFO
  back-to-back transmission support with minimum inter frame spacing
  IEEE 802.3 x 100 BASE-TX Flow Control support
  TCP/UDP checksum off-load capabilities

- Two RS232 ports, 16550 compatible Dual UART; RJ-45
- Two push buttons RESET, ABORT (NMI) Board Status LED's (watchdog active, general purpose)

Software Support

A Universal Boot Loader supports the start of any operating system like WindRiver's VxWorks®.

PCI Expansion Interface

32 bit/33 MHz; 5 V Signaling;
Up to two expansion modules are stackable.
8 HP/12 HP version with one/two PMC slots or two/four PC*MIP slots. This port can also be used to add customized functionality.

VME Interface

ANSI/VITA 1-1994 VME64 interface on P1 (IEEE STD 1014); Universe 2
DTB Master/Slave A16-A24; D08-D16
9 user programmable slave images on VME and PCI bus
4 mailboxes and location monitors for message oriented systems
7 IRQ lines with flexible mapping

Miscellaneous Functions

Timers:	Four 32-bit timers, one 16-bit timer, one watchdog timer
RTC:	backup via GoldCap (5 days) or optional via replaceable battery (10 years)
Debug Port:	JTAG/BDM; 16 Pin row connector

Common

Temp. Ranges:	0 °C to + 70 °C (standard)
	–40 °C to + 85 °C extended)
	–55 °C to + 125 °C (storage)
Oper. Humidity:	0% to 95% (noncond.)

MTBF according to MIL-HDBK 217F

VMP1	164,300h
VMP1-IO1	251,000h

Power Consumption:

+ 5V	6,8W*/typ.
+ 12V	0W*
–12V	0W*

*Without PCI Expansion Module and at 266 MHz, 64 MB SDRAM, 8MB Flash

Dimensions:	100 mm x 160 mm (3U card size)
Front Panel Height::	128.5 mm ;
Width:	20 mm (0.8 inch)/4 HP
Weight::	180 g

Ordering Information

VMP1

Product	Description	Order No.
VMP1[1]	266 MHz MPC8240, 64 MB SDRAM with ECC, 8 MB Flash	20522
VMP1[1]	200 MHz MPC8240, 32 MB SDRAM without ECC, 4 MB Flash	20616
VMP1-IO1[2]	PCI expansion I/O; one PMC slot	20523
FLD-16[3]	16 MByte FLASH-Disk	19643
FLD-24[3]	24 MByte FLASH-Disk	19194
FLD-32[3]	32 MByte FLASH-Disk	19644
NVSRAM-512[4]	512 kByte non volatile SRAM; 32 pin DIP	20656
Cable-RS232	3 meter RS232 Serial Interface cable with RJ45 to 25 Pin D-Sub (male) for terminal connection	15191
VxW-BSP-VMP1[5]	VxWorks Board Support Package for development for use with Tornado on 3.5" floppy disk and the boot image integrated into onboard Flash	20657
KIT-VMP1	User's manual documentation in PDF format on 3.5" floppy disk	20615
MAN-VMP1	Printed user's manual for the VMP1	19973

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Note:
[1] SDRAM capacity of 96 MB or 128 MB and Flash capacity higher than 8 MB on request
[2] PC*MIP or custom I/O modules on request
[3] FLASH-Disks up to 144 MByte are also available on request
[4] Smaller NVSRAM capacity on request
[5] Further Operating System support on request

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