» VMP2 «

3U VME Processor Module

» Optimized design achieving a maximum of computer performance versus power dissipation

» Build around the enhanced Power PC M PC8245, the rugged 3U design is an ideal computing core even for harsh environments

» Highly integrated, the VMP2 is a straigt forward number cruncher

Tough requirements?
The VMP2 does not mind ...

Kontron's VME PowerPC Processor board with Floating point unit based on the MPC8245 is a straight forward computing design.

CPU, Memory and DMA
The VMP2 strictly continues the VME number cruncher line started by the VMP1. It is 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. The board is based on the MPC8245, a highly integrated microprocessor containing a PowerPC MPC603e core with FPU. With the VMP2 design the best possible MPC8245 performance is achieved with a clock frequency of 330 MHz and using synchronous DRAM at 133 MHz.

Anticipating the VMP2's use in data critical applications, the memory data path contains a selectable in-line ECC controller wich can provide SDRAM single bit error correct or double bit error detect.

PCI bus and PCI Expansion capability
PCI ist used as the local bus to connect the MPC8245 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 VMP2. One or two VMP1-IO modules can be plugged together with teh VMP2 (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 bridge) delivers all functionality that ist 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
» Mailbox

LAN
The i8255x 10/100 Mbps Fast Ethernet controller with auto negotiation is the foremost solution for PCI board LAN designs. It combines low power consumption with a small package design wich is ideal for power and space constrained environments.
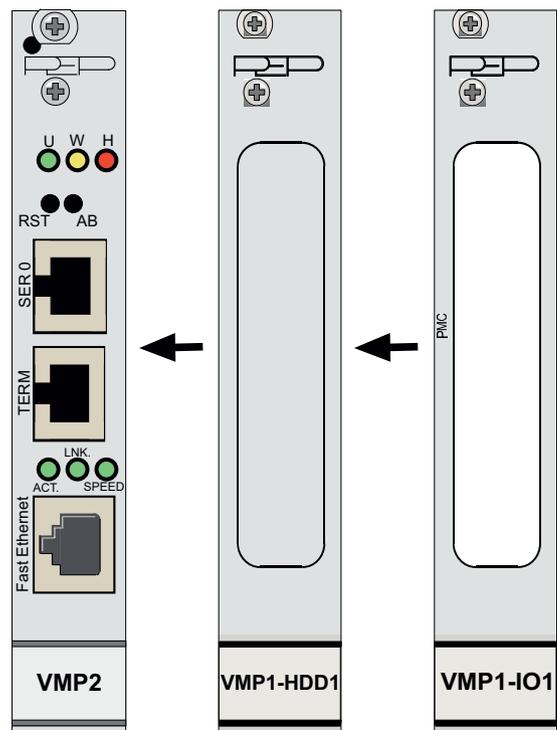
Serial ports
Two high speed serial ports are realized with a 16C2550 UART and support baud rates up to 1.5 Mbps. One is a RS232 full modem interface, the other is configurable (RS232/485) with optional opto isolation.

Debug support
Thw MPC8245 supports processor control and visibility through the JTAG/COP (common on-chip processor) interface that is accessible a a pin row connector on the VMP2. Utilizing third party tools, the developer can access and control the microprocessor. It also has standard IEEE 1149.1a-1993 compiant boundary scan capability. The ECC data patz has a mechanism to manually inject errors into memory for use with maintenance and diagnostic utilities. Furthermore 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 Netboot Loader
The VMP2 employs an operating system independent boot loader that enables loading of OS and application software via Ethernet/Internet or serial line. The boot loader is used to update Flash contents and accomplishes an automatic download from Flash to DRAM before booting the OS.

Specifications
...even in harsh enviroments

Technical Information	
Processor	Integrated PowerPC micorprocessor Motorola MPC8245 (330MHz) with 603e core L1 cache 2x 16 kB data/instructor cache 7.8 SPECint95 6.6 SPECfp95 465 Dhrystone (2.1) MIPS PCIarbiter Two channel controller DMA with chaining Programmable IRQ controller Multiple timers and counters
Memory	Up to 256MB direct soldered SDRAM/64 bit/133MHz with ECC protection (8 bit parity) Up to 8MB direct soldered Flash (Boot Device and Programm Storage) DIL Socket for: NV-SRAM (up to 512kB) / Cell Storage Life 10 years Flash DiskOnChip (up to 144 MB)
Front panel functions	Fast Ethernet Channel 10Base-T/100Base-TX; RJ-45; LAND Status LED's (Activity, Link, Speed) Integrated IEEE 802.3 10BASE-T and 100BASE-TX compatible PHY Integrated power management functions Dynamic transmit chaining with multiple priortires transmit queues Full duplex support at both 10 and 100 Mbps operation IEEE 802.3 u Auto-Negotiation support 3 Kbyte Transmit FIFO and 3 Kbyte Receive FIFO Back-to-Back transmission support with minimum inter frame spacing IEEE 802.3x 100Base-TX Flow Control support TCP/UDP checksum off-load capabilites One full modem RS232 port, one configurable RS232/485 port, opto isolation Optional, 16650 compatible DUAL UART: RJ-45 Two push buttons RESET, ABORT (NMI) Board Status LED's (watschdog active, general purpose)
VME interface	ANSI/VITA 1-1994 VME64 interface on P1 (IEEE STD 1014); Universe 2 DTB Master/Slave A16-A24; D08-D16 9 user programmble slave images in VME and PCI bus 4 mailboxes and location monitors for message oriented systems 7 IRQ lines with felxible mapping
Miscellanous Functions	Timers: Four 32-bit timers, one 16-bit timer, one watchdog timer RTC: backup via GoldCap (5days) or optional via replaceable battery (10 years) Debug Port: JTAG/BDM; 16 pin
Software Support	The VMP2 employs an operating system independet boot loader that enables loading of OS and application software via Ethernet/Internet or serial line. The boot loader is used to update Flash contents and accomplishes an automatic download from Flash to DRAM before boothing the OS. Board Support Packages_ VxWorks 5.4/5.5 OS-9 Linux (SUSE PowerPC)
Reliability	MTBF according to MIL-HDBK 217F VMP2: 134,300h VMP1-IO1: 251,00h
General	Dimensions: 100 x 160 mm (3U card size) Front Panel Heights: 128,5 mm Width: 20mm (0.8inch) / 4HP Weight: 180 g
Power Consumption	+5V 5,8*/typ. +12V 0W* -12V 0W* *Without PCI Expansion Module and at 330MHz, 64 MB SDRAM, 8 MB Flash
Enviromental	Temperature Ranges: 0°C to +70C° (standard), -40°C to +85°C (extended), -55°C to +125°C (storage) Operating humidity: 0% to 90% non-condensing Altitude: 50,000 ft. (15,240 m)

Functional Block Diagram

Ordering Information

Article	Part No.	Description
VMP2	23956	300MHz MPC8245, 64MB SDRAM with ECC, 8MB Flash
VMP2-E2	24124	300MHz MPC8245, 64MB SDRAM with ECC, 8MB Flash Extened temperature range -40°C to +85°C
VMP2	26164	300MHz MPC8245, 256MB SDRAM with ECC, 8MB Flash
VMP1-IO1	20523	PCI expansion I/O; one PMC slot
VMP1-HDD1	26445	Hard disk extension module, 2.5" HDD, current size (>10GByte)
FLD-16	19643	16 MByte FLASH-Disk
FLD-32	19644	32 MByte FLASH-Disk
FLD-96	22146	96 MByte FLASH-Disk
NVSRAM-512	20656	512kByte non volatile SRAM; 32pin DIP
CABLE-SM-RS232-9	10890	3 meter RS232 Serial Interface cable with RJ45 to 9Pin D-Sub (female) for connection to PC
VxW-BSP-VMP1	20657	VxWorks Board Support Package for VMP1/VMP2 for use with Tornado
OS9DPXW-VMP1	21225	OS-9 Board Support Package for VMP1/VMP2 for use with Hawk
LIN-BSP-VMP1	24854	Linux BSP for VMP1/VMP2 for use with SUSE PowerPC distribution
KIT-VMP2	24027	User's manual documentation in PDF format on CD-ROM

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