# VMP3

## 3U VME Processor Module


**Performance**

**Bandwidth**

**Security**

VMEbus Technology

freescale™ Enabled

### Performance

Built around the Freescale **PowerPC MPC8541**, the VMP3 delivers leading edge performance for demanding applications.

### Bandwidth

Dual **Gigabit Ethernet** plus one Fast Ethernet channel provide unprecedented networking bandwidth.

### Security

Due to the integrated **security engine** for encryption and authentication, the VMP3 is a perfect fit for security-relevant communication applications.

# CPU Performance Required ?
## The VMP3 delivers plenty of it ...

Kontron's VME Processor board VMP3 offers pure computing power with a multitude of I/O options.

**CPU and Memory**
The VMP3, based on the Freescale Semiconductors high end PowerPC MPC8541, provides a generous 1520 MIPS at a clock speed of just 660 MHz.
Due to the highly integrated RISC architecture CPU, it offers impressive computing power with a multitude of I/O options at a minimum power consumption. 128 MByte fast DDR-SDRAM is more than enough, even for memory demanding applications. An optional available CompactFlash socket provide a means for rugged, removable mass storage.
Anticipating the VMP3's use in data critical applications, the memory data path contains a selectable in-line ECC controller which can provide single bit error correct or double bit error detect.

**PCI bus and PCI Expansion capability**
PCI is used as the local bus to connect the MPC8541 with the PCI/VME bridge and other onboard components. Moreover, it is routed to a 100 pin PCI expansion connector that can be used to add further functionality to the VMP3. One or two VMP1-IO modules (PMC carrier) or VMP1-HDD1 hard disc modules can be plugged together with the VMP3 (4/6HP versions only) resulting in total package of either 8HP or 10HP.

**VME interface**
The VMEbus interface (Universe 2 bridge) delivers 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
- Mailbox

**LAN**
The highly integrated MPC8541 as a complete system-on-chip by itself provides two Gigabit Ethernet interfaces plus one Fast Ethernet port. All three are accessible at the 3U front panel, leading to an unparalleled Ethernet bandwith.

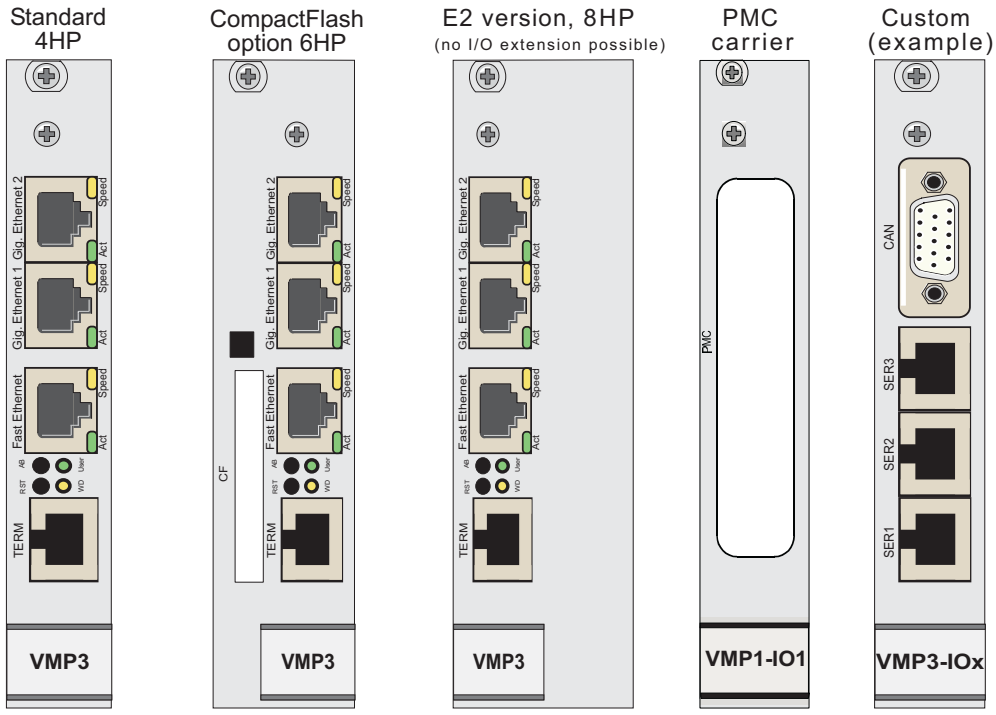
**Integrated Security**
The MPC8541 processor features a security engine for all major encryption algorithms like DES, 3DES, MD-5, SHA-1, AES and ARC-4. A public key accelerator and random-number generator, allowing single-pass encryption and authentication, is included as well.

**Serial ports**
One terminal port (Rx/Tx) is routed to the front panel for configuration purposes, another four serial channels are provided at an extension connector and can be made accessible with an add-on board, hosting the necessary components and connectors.

**Debug support**
The MPC8541 supports processor control and visibility through the JTAG/COP (common on-chip processor) interface that is accessible as a pin row connector on the VMP3. Utilizing third party tools, the developer can access and control the microprocessor. It also has standard IEEE 1149.1a-1993 compliant boundary scan capability.

**Universal Netboot Loader**
The VMP3 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 RAM before booting the OS.

**Front-Panels:** **CPU** **I/O extensions**



# Specification

## ... and phenomenal networking bandwidth

### Processor

Integrated PowerPC microprocessor Freescale MPC8541 with e500 core (PowerPC Book E compliant)
32kB L1 instruction and data cache
256kB on-chip L2 cache
1520 Dhrystone (2.1) MIPS @ 660 MHz
128 Gb/s OCeaN on-chip fabric for excellent data throughput without bottle necks
64 bit PCI-X controller
Four channel DMA
333 MHz DDR memory controller
Programmable IRQ controller

### Memory

128MB direct soldered DDR-SDRAM (266MHz)
8MB direct soldered Flash
64kBit EEProm for storage of configuration data, 1MB SRAM
CompactFlash socket (optional)

### Front Panel Functions

Two Gigabit Ethernet channels 10/100/1GB, RJ-45 with LAN Status LED's (Activity, Link, Speed)
Fast Ethernet channel 10/100B-Tx, RJ-45
IEEE 802.3u Auto-Negotiation support
One full modem RS232 port; RJ-12 connector
Two push buttons RESET, ABORT (NMI)
Board Status LED´s (watchdog active, general purpose)
CompactFlash socket (6HP version)

### VME Interface

ANSI/VITA 1-1994 VME 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

| | |
|---|---|
| RTC: | backup via VME standby power |
| Debug Port: | JTAG/BDM; 16Pin row connector |
| Extension: | PCI extension connector for use with VMP1-IO1 or VMP1-HDD1<br>Signal extension connector for custom I/O boards: (4x serial, LPC) |

### Software Support

The VMP3 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 RAM before booting the OS.
Board Support Packages:
- VxWorks
- Linux

### Reliability

MTBF according to MIL-HDBK 217F

| | |
|---|---|
| VMP3: | 129,888h |
| VMP1-IO1: | 251,000h |

### General

| | |
|---|---|
| Dimensions: | 100mm x 160mm (3U card size) |
| Front Panel Height: | 128.5mm ; |
| Width: | 20mm (0.8inch) / 4HP<br>30mm (1.2inch) / 6HP |
| Weight:: | ca. 300g (dependent on variant) |

### Power Consumption

Power Consumption:

| | |
|---|---|
| +5V | 10W* /typ. |
| +12V | 0W* |
| -12V | 0W* |

*Without PCI Expansion Module and at 660MHz, 128MB DDR-SDRAM, 8MB Flash

### Environmental

| | | |
|---|---|---|
| Temperature Ranges: | Standard (660MHz): | 0°C to + 60°C |
| | E2 (528MHz): | -40°C to + 85°C |
| | **Note: 0.7m/s min. airflow required for temperatures > 65°C** | |
| | -55°C to + 125°C (storage) | |
| Operating humidity: | 93% RH at 40°C, non-condensing (acc. to IEC 60068-2-78) | |
| Altitude: | 50,000 ft. (15,240 m) | |

# Ordering Information

| Product | Description | Order No. |
|---|---|---|
| VMP3 | MPC8541, 660MHz, 128MB DDR-SDRAM with ECC, 8MB Flash, 4HP front panel | 28456 |
| VMP3 | MPC8541, 660MHz, 128MB DDR-SDRAM with ECC, 8MB Flash, CompactFlash socket, 6HP front panel | 28458 |
| VMP3-E2 | MPC8541, 528MHz, 128MB DDR-SDRAM with ECC, 8MB Flash, 8HP, extended temp. range E2 (no I/O extension possible) | 28459 |
| VMP1-IO1 | PCI expansion I/O board; one PMC slot | 20523 |
| VMP1-HDD1 | Hard disk extension module, 2,5" HDD, current size (>20GByte) | 26445 |
| CABLE-VM42-232 | 3 meter RS232 Serial Interface cable with RJ12 to 9Pin D-Sub (female) for connection to PC | 12383 |
| VXW-BSP-VMP3 | VxWorks Board Support Package for VMP3 for use with WindRiver Tornado | 28460 |
| LIN-BSP-VMP3 | Linux BSP for VMP3, distribution independent with cross toolchain and root file system | 28461 |
| KIT-VMP3* | User´s manual documentation in PDF format on CD-ROM | 28462 |
| | *) KIT-VMP3 downloadable from the Internet free of charge | |

VMEbus Technology

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