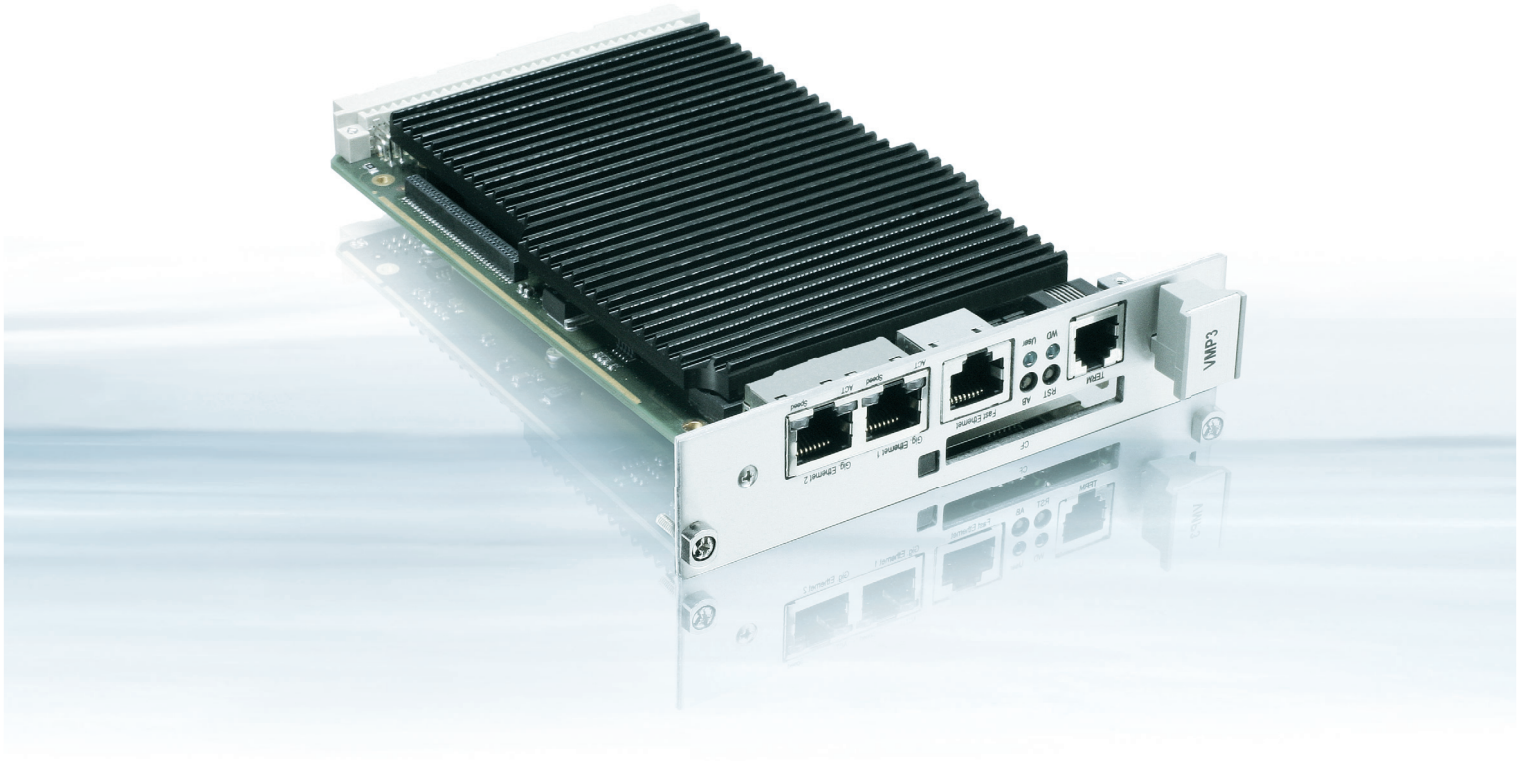
VMP3



3U VME PROCESSOR MODULE

- performance
- bandwidth
- security

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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-onchip 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.

TECHNICAL INFORMATION

PROCESSOR		Integrated PowerPC microprocessor Freescale MPC8541 with e500 core (PowerPC Book E compliant) 32 kByte L1 instruction and data cache 256 kByte 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		128 MByte direct soldered DDR-SDRAM (266 MHz) 8 MByte direct soldered Flash 64kBit EEProm for storage of configuration data, 1 MByte 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 DEBUG PORT EXTENSION	Backup via VME standby power JTAG/BDM; 16Pin row connector PCI extension connector for use with VMP1-IO1 or VMP1-HDD1 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	 VMP3 VMP1-IO1	MTBF according to MIL-HDBK 217F 129,888h 251,000h
GENERAL	DIMENSIONS FRONT PANEL HEIGHT WIDTH WEIGHT	100 x 160 mm (3U card size) 128.5 mm 20 mm (0.8inch) / 4HP 30 mm (1.2inch) / 6HP ca. 300 g (dependent on variant)
VME INTERFACE		+5 V 10W* /typ. +12 V 0W* -12 V 0W* *Without PCI Expansion Module and at 660 MHz, 128 MByte DDR-SDRAM, 8 MByte Flash
ENVIRONMENTAL TEMPERATURE RANGES	STANDARD (660MHZ) E2 (528MHZ) STORAGE OPERATING HUMIDITY ALTITUDE	0° C to + 60° C -40° C to + 85° C Note: 0.7 m/s min. airfl ow required for temperatures > 65° C -55° C to + 125° C 93 % RH at 40° C, non-condensing (acc. to IEC 60068-2-78) 50,000 ft. (15,240 m)

ORDERING INFORMATION

ARTICLE	PART NO.	DESCRIPTION
VMP3	1043-2895	MPC8541, 660 MHz, 128 MByte DDR-SDRAM with ECC, 8 MByte Flash, CompactFlash socket, 6HP front panel
VMP1-IO1	20523	PCI expansion I/O board; one PMC slot
VXW-BSP-VMP3	28460	VxWorks Board Support Package for VMP3 for use with WindRiver Tornado
LIN-BSP-VMP3	28461	Linux BSP for VMP3, distribution independent with cross toolchain and root file system

CORPORATE OFFICES

EUROPE, MIDDLE EAST & AFRICA

Lise-Meitner-Str. 3-5
86156 Augsburg
Germany
Tel.: + 49 821 4086 0
Fax: + 49 821 4086 111
info@kontron.com

NORTH AMERICA

14118 Stowe Drive
Poway, CA 92064-7147
USA
Tel.: + 1 888 294 4558
Fax: + 1 858 677 0898
info@us.kontron.com

ASIA PACIFIC

1~2F, 10 Building, No. 8 Liangshuihe 2nd Street,
Economical & Technological Development Zone,
Beijing, 100176, P.R.China
Tel.: +86 10 63751188
Fax: +86 10 83682438
info@kontron.cn