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Find the *Kontron / Thales / Cetia VMPC4a* at our website: ***Click HERE***

PowerEngine 4th Generation
CETIA VMPC4a

Faster

Using the fastest PowerPC microprocessor available, advanced high performance memory and superior I/O capabilities, the 4th generation PowerEngine is the right product for higher speed applications.

Stronger

With built-in capability for enhanced ruggedization, the VMPC4a range is based on a rugged design adapted to severe environments.

Further

Advanced modular design with built-in growth capability takes the 4th generation PowerEngine into the 21st century.

Click here to see the CETIA PowerEngine VMPC4a Picture

General Overview

CETIA's PowerEngine 4 Family line of products is a highly integrated range of VME Single Board Computers, designed to bring all the power of the PowerPC microprocessors to the VME world.

Formed around the PowerPC microprocessor, CETIA's PowerEngine 4 unique design offers new levels of performance providing both optimized I/O capabilities and memory management, made possible by two PCI buses (33/50 MHz, 32/64-bit).

Pivotal to the PowerEngine 4's high quality, is the UNION Host Bridge, which CETIA incorporates into its product's architecture. The UNION Host Bridge not only performs highly optimized double bank memory management, but as a controller, it also ensures the harmonious interaction between the various PowerEngine 4's high performance features including:

- The PowerPC microprocessor
- The ALMAV64 PCI/VME bridge, a highly integrated single chip solution handling the VME interface
- The COBRA real-time I/O controller, a CETIA ASIC dedicated to I/O interrupt control
- The internal and external PCI buses, both dedicated to CETIA's P2CI cluster architecture and the connection of external PCI devices.

Moreover, the compact design of the PowerEngine 4 series as well as its thermal and mechanical characteristics, make it a product of choice for use in severe environments.

The first model of CETIA's new generation of SBCs, the VMPC4a, not only possesses all the previously mentioned features, it is also backed by the potent PowerPC 604e processor at 200 MHz, which benchmarks the VMPC4a at 8 SPECint 95 and 6.7 SPECfp 95!

Additionally, the PowerEngine VMPC4a, offers a wide range of operating systems and development solutions for VME system developers. Because the VMPC4a is further defined by most of the PowerPC based CHRP (Common Hardware Reference Platform) standards,

it ensures compatibility with the PowerPC servers, workstations and VME target systems, resulting in lower costs and maximum value for software development.

Click here to see the CETIA PowerEngine VMPC4a Key Features Overview

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Click here to see the CETIA PowerEngine VMPC4a Block Diagram

Click here to see the CETIA PowerEngine VMPC4a Front Panel

PowerPC Processor Family

- Superscalar PowerPC 604e processor operating from 200 MHz upwards
- SPECint95 (200 MHz) : 8.02
- SPECfp95 (200 MHz) : 6.72
- 32-KB instruction cache and 32-KB data cache
- Four instructions per clock cycle
- Dynamic branch prediction
- Multiple integer units
- Memory Management Unit (MMU)
- 64-bit data bus
- Fully JTAG compliant
- Low Power implementation



Ethernet Interface

- On-board PCnet-PCI Ethernet controller (10Base-T on front panel or Thick on P2)

- ANSI 802.3 compliant
- Handled by the AM79C970 chip

SCSI-2 Interface

This interface enables easy connection with industry-standard mass storage devices (hard disk, CD-ROM, streamer,..).

- Handled by the SYM53C825A PCI-SCSI I/O processor (SIOP)
- Fast/Wide SCSI bus transfers in single-ended mode



Serial Lines

- Two available RS232C channels containing FIFOs
- Handled by TL16C550C component
- INS8250N-B, PC16550A, PC16450 software compatible



ALMAV64 VME Interface

- Handled by the ALMAV64/IBM PCI to VME bridge component, a highly integrated low power single chip solution
- VME64 ANSI/VITA 1-1994 fully compliant
- VMEbus system controller
- VMEbus Requester (Level 1-4)
- VMEbus Interruptor and Interrupt handler (IRQ1-7)
- VME transfer rate: 65 MB/sec
- VMEbus master/slave A32, A24, A16 : D32, D16, D8, UAT
- VMEbus master/slave A32, A24 : D32BLT, D64MBLT
- Programmable VME slave image base address and size (8 VME slave channels)
- VME to PCI access conversion through 8 MB granularity
- Transmit/Receive FIFOs
- Programmable Posted Write, Prefetch Read, coupled mode
- Programmable BB2BLT mode: mapping of multiple single PCI accesses to a VMEbus BLT/MBLT cycle
- Semaphore registers



Keyboard / Mouse

- PS/2 compatible keyboard and mouse interface handled by an INTEL 82C42PE with Phoenix Multikey/426 compatible BIOS

DRAM Memory

- 16, 32, 64, 128 MB of on-board DRAM with ECC
- DRAM extensions are provided by 1 or 2 daughter boards (IPMD modules), each one offering 32, 64 or 128 MB with ECC

- Double bank memory management handled by the UNION host bridge

Cache Memory

- Users who require extra performance can exploit a secondary cache option. The 512 KB L2 Look-aside cache is directly connected to the processor bus (IPML2 module).



ROM Memory

- 512 KB or 1 MB of Flash EPROM memory are available for initialization and operating system boot routines.
- In addition, 4 to 32 MB of user Flash EPROM are devoted to embedded user programs (IPMF option).

NVRAM/RTC

- Using the MT48T18 chip, on board (8-KB) NVRAM provides a convenient removable battery-backed storage area.
- Time of day clock available with M48T18



PCI Interface

Two PCI interfaces (master/slave with burst capability) are implemented on the PowerEngine VMPC4a:

· The first one, is internal and provides a high-speed backbone for local interconnect of on-board devices (Host Bridge, Ethernet, SCSI-2,...). This interface is fully compliant to PCI Specs- Rev.2.0 (33 MHz, 32-bit).

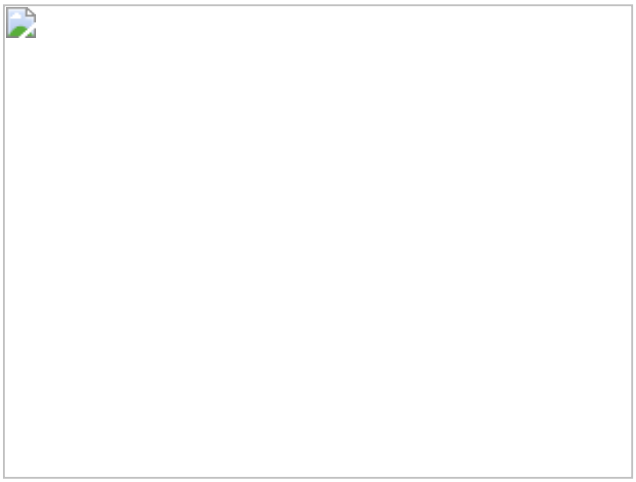
· The second one, called Enhanced PCI (EPCI), is a user PCI interface designed for connecting 5/12V PMC mezzanine modules (SCSI2, Graphics, Ethernet, FDDI, ATM..), and provides a Rev. 2.0 standard PCI interface (32/64-bit) that can operate at either 33 or 50 MHz.

The PowerEngine VMPC4a can maintain concurrent bus operations on the two PCI buses using a uniquely optimized host bridge (UNION).

This allows applications using PCIs to operate efficiently in parallel, doubling available throughput.



PCI Interconnectivity



PMC Carrier Card

For configurations requiring additional PCI connectivity, CETIA offers a PMC carrier card (ICPMC) that provides an extra three PMC slot module. This PMC carrier is fitted in an adjacent VMEbus slot. Applications requiring up to three PCI slots (such as redundant configurations) are therefore easily implemented.

The following table summarizes the number of PMC slots available with/without the carrier board (ICPMC).

CONFIGURATION	Available PMC Slots	VME Slots
VMPC4a without ICPMC Carrier card	1	1
VMPC4a with ICPMC Carrier card	3	2

CETIA Dedicated Real-Time I/O Controller : COBRA

The COBRA chip brings a highly integrated single chip solution to control interrupts, providing up to 32 I/O device IT inputs and 4 interprocessor interrupts.

Furthermore, this product is optimized for real-time applications and offers:

- Connection to PCI bus Rev. 2.1 (slave mode)
- ISA-like interface for serial ports, keyboard/mouse, optional floppy disk, RTC...
- Large non-volatile memory interface (NVRAM, Flash, ...)
- Optimized message passing with four high density FIFOs
- General purpose I/Os (L2 cache control, dead lock control, timer/divider, ...)
- Four highly programmable 31-bit global timers

Software

CETIA provides a wide range of Operating Systems on the PowerEngine 4 CPU.

- AIX : IBM's popular UNIX operating system is certified on CETIA platforms and branded according to the IBM Multi Vendor Platform (MVP) program. This certification guarantees the compatibility at ABI and API levels with the IBM RS/6000 servers and workstations, giving access to all the commercial software available on these platforms.
- LynxOS from LynxRTS: this real-time environment is jointly supported by CETIA and its developers, in order to ensure customers the best possible service.
- Tornado/VxWorks from Wind River Systems: the CETIA PowerEngine 4 is a core BSP product and is part of the WRS operating system standard distribution.

Furthermore, CETIA provides optimized functionality and support with an offering of customized services, on an "on request" basis for system integrators.

Moreover, CETIA has introduced its PowerLine, a complete range of software toolkits, providing both enhancements and specific tools for real-time applications and cluster architectures.

CETIA's PowerLine offering includes:

PowerLine Standard Kit	- CETIA PMC and VME I/O boards support - X11 server for CETIA graphics boards
PowerLine Performance Kit	- Optimized C/C++ cross compiler and real-time features for PowerPC processor - Enhanced analysis tools (TRACE/CRASH) - Remote GDB (GNU debugger), ECC support, floating point libraries
PowerLine Cluster Kit	- TCP/IP and Raw Ethernet on VME64 cluster and on PCI bus backplane (P2CI) - Extended semaphores on VME 64
PowerLine X25, ATM Kit	- LAN/WAN communication software stacks for CETIA communication boards (CPMC-ATM, VMEOb) -TCP/IP to ATM, classical IP, LAN emulation - HDLC, LAPB, X25, IP/X25 on CETIA VMEOb
PowerLine Fortran Cross Compiler	- Fortran cross compiler for CETIA boards Host RS/6000 AIX .

CETIA's PowerEngine 4 also supports most of the ADA development tools and compilers available today on the market (Aonix, Rational, ...).



CETIA's Product Warranty and Services

- All of CETIA's hardware products are covered by a twelve month return-to-factory warranty.
- Several service programs are available, which include update services, hotline access, product repair and exchange services, technical assistance, on-site or remote technical assistance.

Miscellaneous

- Board size: VME double Eurocard (6 U - 233,3 mm x 160 mm)
- Single or dual slot (depending on options)

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- The VMPC4a supports a broad spectrum of environmental conditions to withstand shock and vibration levels found in most light-to medium industrial or military applications.



VMPC4a Order Codes

Product Description	Order Code
6U VME Card	
604e 200 MHz, 16 MB, No L2 cache	VMPC4a-200-16
604e 200 MHz, 32 MB, No L2 cache	VMPC4a-200-32
604e 200 MHz, 64 MB, No L2 cache	VMPC4a-200-64
604e 200 MHz, 128 MB, No L2 cache	VMPC4a-200-128
Options	
512 KB L2 cache	IPML2
DRAM extension daughter board	IPMD
(32, 64, 128 MB) with ECC	
P2 transition module	CP2-CVME
SCSI only P2 transition module	CP2SI-CVME
PCI carrier (2 additional PMC slots)	ICPMC
4/32 MB User Flash EPROM	IPMF
No VME interface	Contact CETIA



VMPC4a Connector Table

Reference Interface	Front Panel	P2 CP2-CVME	P2 CP2SI-CVME	Header (on Mother board)
Serial Line 1	9-pin micro SUBD	15-pin IDC	NA	NA
Serial Line 2	No	15-pin IDC	NA	NA
SCSI Wide	68-pin Socket Connector	8/16 bit SCSI HE10	8/16 bit SCSI HE10	NA
Ethernet	8-pin RJ45 (10 Base-T)	15-pin DType Socket	NA	NA
Keyboard/Mouse	15-pin micro SUBD	26-pin IDC	NA	NA
Floppy *	NA	NA	NA	Yes (P7 connector)

* contact CETIA



PowerEngine VMPC4 - Technical Features

CPU	
Processor	PowerPC 604e
Clock Frequency	200 MHz
SPECint 95	8,02
SPECfp 95	6,72
MEMORY	
Global Memory	16, 32, 64, 128 MB on board
	Up to 256 MB with IPMD mezzanine memory modules.
ECC	Yes (standard)
Cache Memory	512 KB (IPML2 mezzanine module)
ROM Flash Memory	512 KB / 1 MB System Flash Memory
	Up to 32 MB User Flash Memory
	optional (IPMF mezzanine module)
	
VME INTERFACE	
	- 32-bit with VME64 capability
	- A32/A24/A16 master / slave
	- D64 (MBLT) / D32 (BLT) / D16 / D8 master / slave
	- 3/5 rows connector
USER PCI INTERFACE (EPCI)	
	- PCI fully compliant (33 MHz, 32/64-bit)
	- 50 MHz optional interface
	- P2 CIconnectivity (manufacturing option):
	32-bit interface: 3 rows
	64-bit interface: 5 rows
	
INTERNAL PCI INTERFACE	
On board I/O devices	- 33 MHz / 32-bit
	- PCI Rev. 2 fully compliant
ETHERNET INTERFACE	
	10 Base T (front panel)
	AUI Thick (P2)
SCSI INTERFACE	
	8/16-bit fast SCSI2
	

MISCELLANEOUS	
	2 PC compatible serial I/Os
	PS/2 compatible Keyboard / Mouse
	Optional floppy disk interface
	1 PMC slot (up to 3 with ICPMC carrier card)
POWER REQUIREMENTS	
	Maximum
+5V, + 5%, - 2,5 %	6.8 A (without cache)
	7.5 A (with 512 KB L2 cache)



ENVIRONMENTAL SPECIFICATIONS	
Temperature range	0 to 55° C Ambient (operating) -40° to 85° C (storage)
Recommended Cooling	A linear airflow of not less than 1.2 m/s across the board
Relative Humidity	Up to 95% without condensation
Altitude	15000 ft
Vibration	5 to 500 Hz at 2g acceleration
Shock	20g for 11 ms (peak sawtooth)





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