



VMICPCI-7697

Single-Slot Pentium II Embedded Module Peripheral-Slot CompactPCI SBC with High-Availability Hot Swap

- Single-slot Pentium® II processor-based embedded module single-board computer (SBC)
- Special features for embedded applications
 - M-Systems, Inc.'s Flash DiskOnChip® (optional)
 - 16 Mbyte bootable flash on secondary IDE
 - Three programmable 16-bit timers
 - 32 Kbyte of battery-backed SRAM
 - Remote Ethernet booting
 - Software-selectable watchdog timer with reset
 - PMC expansion site
 - Peripheral-slot SBC (embedded PCI bridge allows on-board Pentium II processor to operate independent of the CompactPCI® bus)
 - Compliant with CompactPCI 2.0 revision 2.1
 - Compliant with PICMG® 2.1 Rev. 1.0 for high-availability hot swap
- Standard features include
 - Pentium II processor with speeds up to 333 MHz
 - Up to 512 Mbyte SDRAM using two 144-pin SODIMM modules
 - 64-bit AGP SVGA controller with 4 Mbyte SGRAM
 - On-board Fast Ethernet controller supporting 10BaseT and 100BaseTX interfaces
 - On-board Ultra DMA/33 hard drive and floppy drive controllers with CompactPCI J3 I/O
 - Two high-performance 16550-compatible serial ports. One RJ11 connector available at front panel, and both serial ports available through CompactPCI J3 connector.
 - Enhanced parallel port with ECP/EPP modes supported, available at front panel or through CompactPCI J3 connector (front panel access requires connector adapters to interface to the Micro-D-style connector)
 - Two USB ports (one front panel USB port, one CompactPCI J3 connector USB port)
 - PS/2-style keyboard and mouse port on front panel
 - Real-time clock and miniature speaker included
 - Passive heat sink
- Operating system support
 - Windows NT®/Windows® 2000
 - VxWorks
 - QNX
 - Solaris
 - Linux
 - LynxOS

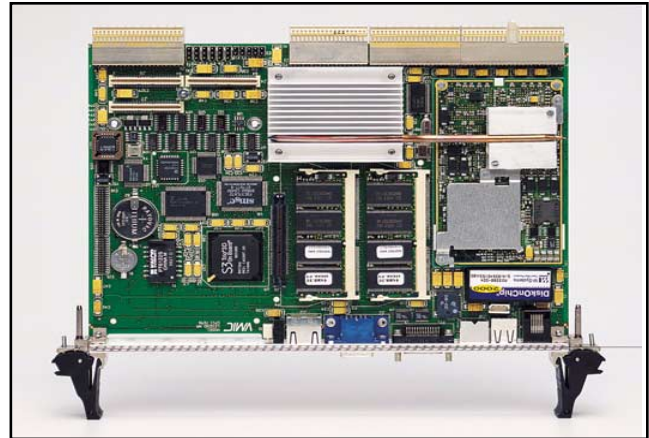
APPLICATIONS

- Telecommunications
- Simulation
- Instrumentation
- Industrial control
- Process control and monitoring
- Factory automation
- Intelligent networked PLC controllers
- Automated test
- Data acquisition

MICROPROCESSOR — The VMICPCI-7697 brings Intel® Pentium II processor with MMX™ to CompactPCI bus, offering processor speeds up to 333 MHz. The Pentium II processor has 32-bit addressing and a 64-bit data bus. Its superscalar architecture allows three instructions to be executed per clock cycle. A dynamic branch prediction unit, separate instruction and data caches, and MMX technology also increase the Pentium II processor's performance. The Pentium II processor also provides internal L2 cache using dual independent bus architecture for high bandwidth and performance.

HIGH-AVAILABILITY HOT SWAP — The VMICPCI-7697 complies with PICMG 2.1 Rev. 1.0 standard for CompactPCI hot swap. The VMICPCI-7697 complies with the high-availability provisions of this standard. This means that, in addition to being able to remove and replace the board with the system operating, processing can automatically be switched to a second *backup* board already installed in the system in the event of failure in the primary processor.

DRAM MEMORY — The VMICPCI-7697 accepts 144-pin SODIMM SDRAM modules for a maximum



Ordering Options							
March 30, 2001 800-657697-000 K	A	B	C	-	D	E	F
VMICPCI-7697	-			-			
A = Processor 0 = Not Used 1 = Reserved 2 = Reserved 3 = Reserved 4 = 333 MHz Pentium II Processor 5 = Reserved 6 = Reserved B = SDRAM Memory 0 = Reserved 1 = Reserved 2 = Reserved 3 = 32 Mbyte 4 = 64 Mbyte 5 = 128 Mbyte 6 = 256 Mbyte 7 = 384 Mbyte 8 = 512 Mbyte C = DiskOnChip 0 = No DiskOnChip 1 = Reserved 2 = Reserved 3 = Reserved 4 = Reserved 5 = 72 Mbyte 6 = 144 Mbyte 7 = 288 Mbyte							
CompactPCI Rear Transition Utility Board							
VMIACC-0576							
The VMIACC-0576 mounts in the rear transition area of the backplane and provides access to the serial, USB, parallel, enhanced IDE, and floppy disk connectors by way of the J3 connector, and provides PMC I/O signals by way of the J5 connector. The VMIACC-0576 is sold separately.							
Connector Adapter							
360-010051-000							
A connector adapter, part number 360-010051-000, is available to adapt the product's front panel 25-pin parallel port Micro-D connector to a Standard-D 25-pin connector. This adapter is sold separately.							
For Ordering Information, Call: 1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859 E-mail: info@vmic.com Web Address: www.vmic.com Copyright © February 1998 by VMIC Specifications subject to change without notice.							

memory capacity of 512 Mbyte. The on-board DRAM is dual ported to the CompactPCI bus.

DiskOnChip — The VMICPCI-7697 provides the option to include 72, 144, or 288 Mbyte of memory accessible through M-Systems, Inc.'s DiskOnChip. This memory can be used as boot flash memory, or can be installed

by the BIOS as an additional standard drive. No additional software is required. The DiskOnChip can be used as the only drive in the system, or can be used as a second drive.

BIOS — System BIOS, video BIOS, and LAN Boot BIOS are provided in reprogrammable flash memory. BIOS loader software is also provided.

SUPER VGA CONTROLLER — High-resolution graphics and multimedia-quality video are supported on the VMICPCI-7697 by an S3 Trio 3D AGP graphics adapter. The adapter is complemented by 4 Mbyte synchronous DRAM with a high-bandwidth 64-bit data interface. Screen resolutions are shown in the following table.

Screen Resolution	Maximum Colors	Maximum Refresh Rates (Hz)
640 x 480	16 M	85
800 x 600	16 M	85
1,024 x 768	16 M	85
1,280 x 1,024	64 K	60
1,600 x 1,200	64 K	60

Ethernet CONTROLLER — The VMICPCI-7697 supports Ethernet LANs with the Intel 21143 PCI Ethernet controller. 10BaseT and 100BaseTX options are supported via an RJ45 connector. Remote LAN booting is supported.

REMOTE Ethernet BOOTING — The VMICPCI-7697 utilizes Lanworks Technologies, Inc.'s BootWare®. BootWare provides the ability to remotely boot the VMICPCI-7697 using NetWare, TCP/IP, or RPL network protocols. Remote Ethernet booting is not operable with M-Systems, Inc.'s DiskOnChip option. Lanworks Technologies, Inc. only supports one logical drive in addition to the remote boot network drive.

BootWare Features:

- NetWare, TCP/IP, RPL network protocol support
- Unparalleled boot sector virus protection
- Detailed boot configuration screens
- Comprehensive diagnostics
- Optional disabling of local boots
- Dual-boot option lets users select network or local booting

SERIAL PORTS — Two 16550-compatible serial ports are featured on the VMICPCI-7697. Each serial channel has an independent 16-byte FIFO to support baud rates up to 56 kHz. One four-wire serial port is available as an RJ11 connector on the front panel. Both serial ports are also available through the CompactPCI J3 connector.

ENHANCED PARALLEL PORT — Also accessible on the VMICPCI-7697 front panel and the CompactPCI J3 connector is a Centronics-compatible, fully bidirectional parallel port meeting all IEEE-1284 standards (Compatibility, Nibble, EPP, and ECP). The parallel port contains a 16-byte FIFO to allow data rates up to 2 Mbyte/s in ECP mode (requires individual connector adapter for front panel access).

USB PORTS — The VMICPCI-7697 provides two Universal Serial Bus (USB) ports. One port is available at the

front panel and the second port is available at the CompactPCI J3 connector.

KEYBOARD AND MOUSE PORTS — The VMICPCI-7697 supports a combined PS/2 keyboard and mouse connector for peripherals. A Y-adaptor cable is supplied with the unit.

FLASH MEMORY — In addition to the optional DiskOnChip Flash, the VMICPCI-7697 provides 16 Mbyte of flash memory accessible through the secondary IDE port. The VMICPCI-7697 BIOS includes an option to allow the board to boot from the flash memory.

The on-board flash emulates a hard disk drive. Accesses to flash are identical to file operations for a hard disk drive. Because of the hard disk emulation feature, no OS-specific software drivers are required for flash memory operation.

16-bit TIMERS — The VMICPCI-7697 provides the user with three 16-bit timers which are 82C54 compatible. These timers are mapped in I/O space, and are completely software programmable.

WATCHDOG TIMER — The VMICPCI-7697 provides a software-programmable watchdog timer. The watchdog timer is enabled under software control. Once the watchdog timer is enabled, on-board software must access the timer within the specified timer period, or the output of the watchdog timer will reset the unit.

BATTERY-BACKED SRAM — The VMICPCI-7697 provides 32 Kbyte of battery-backed SRAM. The contents of the SRAM are preserved when +5 V power is interrupted or removed from the unit.

RESET SWITCH AND ANNUNCIATORS — A small push-button switch on the front panel will reset the VMICPCI-7697. Only the on-board VMICPCI-7697 logic will be reset. There will be no reset generated on the CompactPCI bus. Five LEDs are visible on the front panel: +5 V power, board status, IDE activity, LAN activity, and LAN Mode (10 or 100 MHz mode). A small speaker is also included on the VMICPCI-7697 to provide PC/AT sound output.

PMC EXPANSION SITE — The VMICPCI-7697 supports IEEE P1386 common mezzanine card specification with a 5 V PCI mezzanine card expansion site. PMC I/O is routed to the CompactPCI J5 connectors.

The following is a partial list of commercially available PMC modules:

- Fibre Channel
- Analog and digital I/O
- High-speed serial and parallel I/O
- Networking adapters: FDDI, ATM, 100BaseTX Ethernet, Fast Ethernet
- PMC-to-PC Card adapter
- MIL-STD-1553 bus interface
- SRAM
- Flash
- Solid-state disk
- Data acquisition cards
- SCSI-2 adapter
- Parallel links

- Octal DSP
- Quad SIO
- GPIB
- FAX/modem
- Second Ethernet
- PMC-to-PMC expanders

Contact VMIC for more information concerning third-party PMC modules and compatibility.

CompactPCI bus BRIDGE — The VMICPCI-7697 incorporates a PCI peripheral device that performs PCI bridging functions for embedded and intelligent I/O applications. The PCI device acts as a gateway to an intelligent subsystem. It allows the local VMICPCI-7697 Pentium II processor to configure and control the on-board local subsystem independent from the CompactPCI bus host processor. The VMICPCI-7697 local PCI subsystem is presented to the CompactPCI bus host as a single CompactPCI *device*.

The VMICPCI-7697 PCI bridge device provides the following features:

PCI Interface

- Fully compliant with the PCI Local Bus Specification, Revision 2.1
- 3.3 V operation with 5.0 V tolerant I/O
- Concurrent local (secondary) and CompactPCI (primary) bus operation
- Supports full hot swap and high-availability hot swap per PICMG 2.1 Rev. 1.0

Buffer Architecture

- Queuing of multiple transactions in either direction
- 256 byte of posted write (data and address) buffering in each direction
- 256 byte of read data buffering in each direction
- Four delayed transaction entries in each direction

Configuration Registers and CSRs

- Two sets of standard PCI configuration registers corresponding to the local and CompactPCI interfaces. Each set is accessible from either the local or CompactPCI interface.
- Four 32-bit base address configuration registers mapping the control and status registers (CSRs)

Transaction Forwarding

- Four primary interface base address configuration registers for downstream forwarding with size and prefetchability programmable for all four address ranges
- Direct offset address translation for downstream memory and I/O transactions
- Three secondary interface address configuration registers specifying local address ranges for upstream forwarding with size and prefetchability programmable for all three address ranges
- Inverse decoding above 4 Gbyte address boundary for upstream DACs

- Ability to generate type 0 and type 1 configuration commands on the primary or secondary interface via configuration or I/O CSR accesses

OPERATING SYSTEM AND SOFTWARE

SUPPORT — VMIC has a wide range of software products designed to run on Intel processor-based SBCs, such as the VMICPCI-7697. These products are aimed at developers who are incorporating VMIC SBCs, I/O boards, and workstations into systems. Windows NT/Windows 2000 and VxWorks are the most common operating systems supported.

Windows NT/Windows 2000

The VMISFT-9421, generic hardware driver for Windows NT/Windows 2000, is not required to run Windows NT/Windows 2000 on the VMICPCI-7697, but is very useful in those cases where the driver for peripheral devices are not available.

The generic hardware driver is a set of functions and utilities that make it possible to easily develop, debug, and run standard Windows NT/Windows 2000 applications that access any PC Card (PCMCIA), PMC, and CompactPCI devices.

Visual Basic®, C/C++, IOWorks® Soft Logic Link™ and any other language that can call functions in a dynamic link library or connect to a DDE server are supported.

VxWorks

The VMISFT-7418, VxWorks board support package (BSP), is a Wind River Systems, Inc. certified board support package for VMIC's series of CompactPCI Pentium processor-based computers that is required to run the VxWorks OS. With the SBC, VxWorks, the BSP, and other CompactPCI equipment from VMIC, implementations can be created for a wide variety of applications, including real-time factory automation, telecommunications, simulation, instrumentation and control, and process control and monitoring.

VMISFT-7418 is linked by the user with VxWorks OS, thus allowing software applications created with Wind River Systems, Inc.'s development system to load and run on the particular VMIC SBC hardware being used. Serial ports, parallel ports, keyboard, text mode video, and Ethernet are all supported, as well as floppy and IDE hard disk drives that can be connected to the computer boards. The BSP also provides Flash boot, NVRAM, and timer support.

VMISFT-7418 allows VxWorks applications to have access to the CompactPCI bus including memory, I/O, and configuration cycles. The BSP provides interprocessor communications capability. The interprocessor communications provides system-slot SBC to peripheral-slot communications via the CompactPCI bus.

QNX, Solaris, and LynxOS

QNX, Solaris, and LynxOS are supported by VMICPCI-769x without the need for additional software drivers. The timers and battery-backed RAM may be accessed directly by application code.



SPECIFICATIONS

6U Eurocard format, one slot	
Height	9.2 in. (233.4 mm)
Depth	6.3 in. (160 mm)
Thickness	0.8 in. (20.3 mm)

Power Requirements:

+5 VDC (± 5 percent), 1.3 (typical), 2.4 A maximum
+3.3 VDC (± 5 percent), 2.2 (typical), 2.5 A maximum
+12 VDC (± 5 percent), 105 mA (typical), 200 mA maximum
-12 VDC (± 5 percent), 50 mA (typical), 75 mA maximum

Note: The currents at +12 and -12 VDC are specified with the serial connectors open.

Operating Temperature: 0 to 55 °C (Forced air cooling required, 250 LFM minimum)

Relative Humidity: 10 to 90 percent, noncondensing

PMC Expansion Site Connector:

5 V signaling, types 1 and 2
32-bit PCI bus, 33 MHz maximum
MTBF: 142,168 hours (Bellcore)

COMPATIBLE PRODUCTS

PMC Expansion Site: VMIC supports the PMC expansion site with its VMIPMC-5576XL Reflective Memory interface. Reflective Memory provides high-speed network using memory. Data written into local memory is also written into the memories of all other nodes on the network. This error-free transmission requires no overhead from the host processor.

TRADEMARKS

Soft Logic Link is a trademark and IOWorks and the VMIC logo are registered trademarks of VMIC. MMX is a trademark and Intel and Pentium are registered trademarks of Intel Corporation. Visual Basic, Windows, and Windows NT are registered trademarks of Microsoft Corporation. CompactPCI and PICMG are registered trademarks of PCI Industrial Computer Manufacturers' Group. BootWare is a registered trademark of Lanworks Technologies, Inc. DiskOnChip is a registered trademark of M-Systems, Inc. Other registered trademarks are the property of their respective owners.

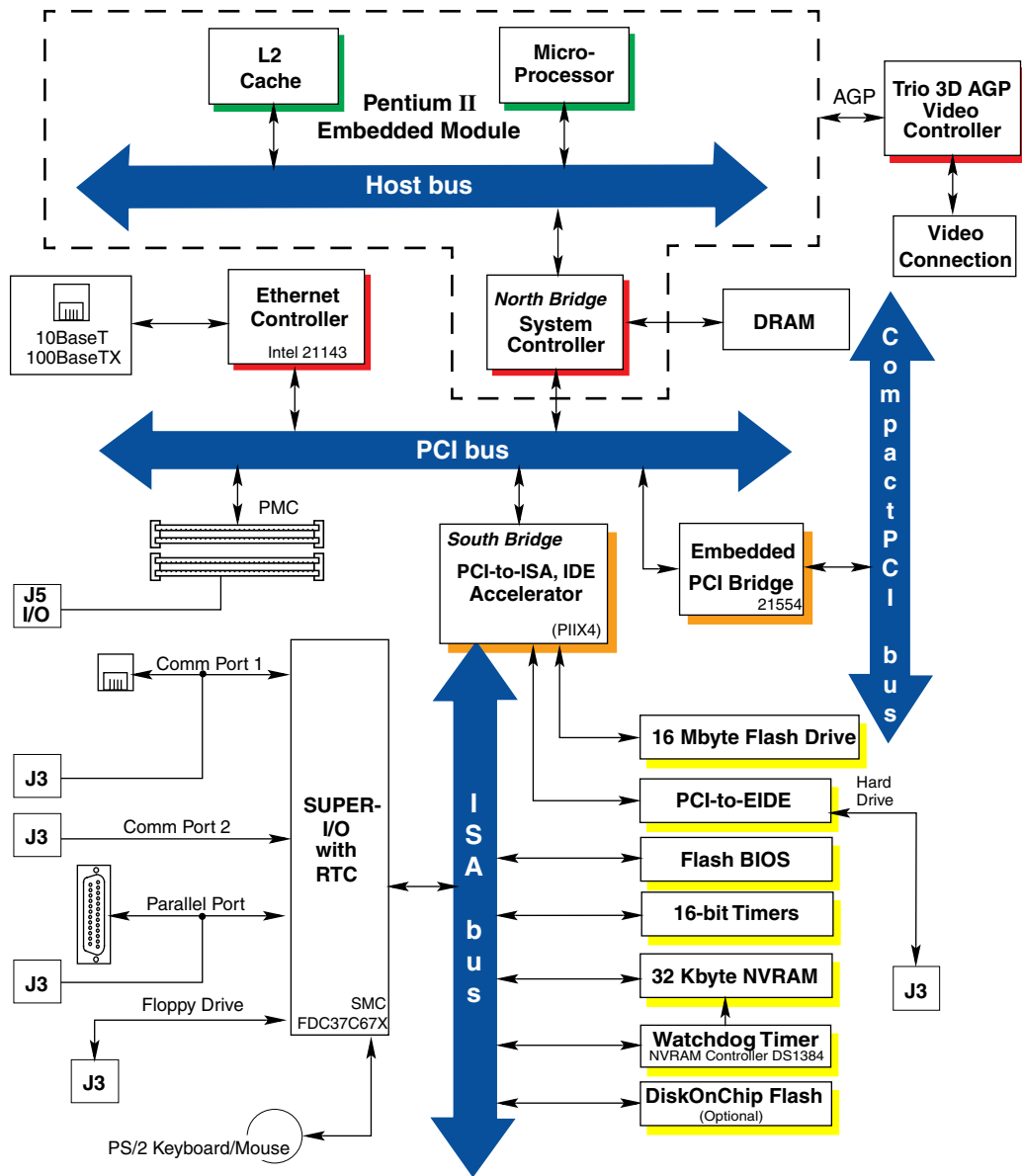


Figure 1. VMICPCI-7697 Block Diagram