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VMICPCI-7699

Single-Slot Pentium II/III Embedded Module Peripheral-Slot CompactPCI Single-Board Computer with High-Availability Hot Swap and Dual PMC

- Single-slot Pentium® II/III processor-based embedded module single-board computer (SBC)
- Special features for embedded applications
  - — Up to 96 Mbyte IDE CompactFlash (optional)
  - — Three programmable 16-bit timers
  - — 32 Kbyte of nonvolatile SRAM
  - — Remote Ethernet booting
  - — Software-selectable watchdog timer with reset
  - — Dual PMC expansion sites
  - — Peripheral-slot SBC (embedded PCI bridge allows on-board Pentium II/III processor to operate independent of the CompactPCI® (CPCI) bus)
  - — Compliant with CPCI 2.0 revision 2.1
  - — Compliant with PICMG 2.1 Rev. 1.0 for high-availability hot swap
  - — Support for geographical addressing
  - — Supports system management bus (I^2C)
- Standard features include
  - — Pentium II/III processor with speeds up to 500 MHz
  - — Up to 256 Mbyte SDRAM using two 144-pin SODIMM modules
  - — 64-bit AGP SVGA controller with 2 Mbyte SGRAM
  - — On-board Fast Ethernet controller supporting 10BaseT and 100BaseTX interfaces
  - — On-board Ultra-DMA-33 hard drive and floppy drive controllers with CPCI J3 I/O
  - — Two high-performance 16550-compatible serial ports
  - — One 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

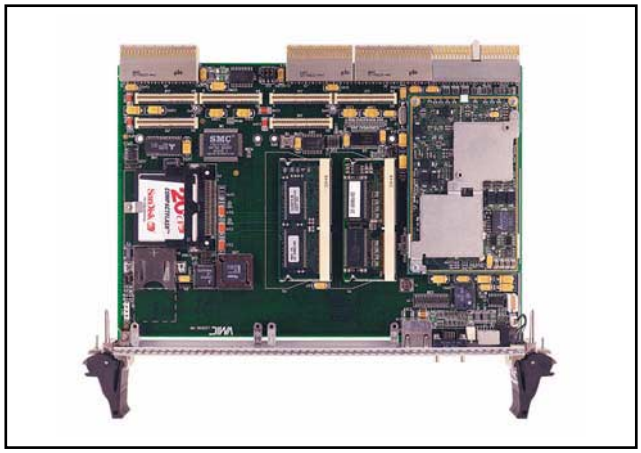
- Telecommunications
- Simulation
- Instrumentation
- Industrial control
- Process control and monitoring
- Factory automation
- Intelligent networked PLC controllers
- Automated test
- Data acquisition

MICROPROCESSOR — The VMICPCI-7699 brings Intel® Pentium II/III processor with MMX™ to CPCI bus, offering processor speeds up to 500 MHz. The Pentium II/III 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/III processor's performance. The Pentium II/III processor also provides internal L2 cache using dual independent bus architecture for high bandwidth and performance.

HIGH-AVAILABILITY HOT SWAP — The VMICPCI-7699 complies with PICMG 2.1 rev. 1.0 standard for CPCI hot swap. The VMICPCI-7699 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-7699 accepts 144-pin SODIMM SDRAM modules for a maximum memory capacity of 256 Mbyte. The on-board DRAM is dual ported to the CPCI bus.

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



Ordering Options								
January 12, 2001 800-657699-000 F		A	B	C	–	D	E	F
VMICPCI-7699	–				–			

A = Processor
0 = Not Used
1 = Reserved
2 = Reserved
3 = Reserved
4 = 333 MHz Pentium II Processor
5 = Reserved
6 = 500 MHz Pentium III Processor

B = SDRAM Memory
0 = Reserved
1 = Reserved
2 = Reserved
3 = 32 Mbyte
4 = 64 Mbyte
5 = 128 Mbyte
6 = 256 Mbyte
7 = Reserved

C = CompactFlash Drive
0 = None
1 = 8 Mbyte
2 = Reserved
3 = Reserved
4 = 64 Mbyte
5 = 96 Mbyte
6 = 128 Mbyte
7 = 160 Mbyte
8 = 192 Mbyte

CPCI Rear Transition Utility Board

VMIACC-0577

The VMIACC-0577 mounts in the rear transition area of the backplane and provides access to the serial, USB, enhanced IDE, floppy disk, and PMC I/O connectors by way of the J3 and J5 connectors. The VMIACC-0577 is sold separately.

Video Connector Adapter Kit

A connector adapter, part number 360-000168-004, is available to adapt the product's front panel, 9-pin video port micro-D connector to a standard-D 15-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
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SUPER VGA CONTROLLER[1] — High-resolution graphics and multimedia-quality video are supported on the VMICPCI-7699 by an Intel 69000 AGP graphics controller. The controller contains on-chip 2 Mbyte synchronous

1. The VMICPCI-7699 requires an adapter cable (available separately) to adapt the board's micro-DB9 connector to the standard VGA high-density DB15 connector.

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DRAM with a high-bandwidth 64-bit data interface and supports screen resolutions up to 1,600 x 1,200 x 256 colors.

Ethernet CONTROLLER — The VMICPCI-7699 supports Ethernet LANs with the Intel 82559 PCI Ethernet controller. 10BaseT and 100BaseTX options are supported via an RJ45 connector.

REMOTE Ethernet BOOTING — The VMICPCI-7699 utilizes Lanworks Technologies, Inc.'s BootWare®. BootWare provides the ability to remotely boot the VMICPCI-7699 using NetWare, TCP/IP, or RPL network protocols.

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-7699. Each serial channel has an independent 16-byte FIFO to support baud rates up to 115 kHz.

USB PORT — The VMICPCI-7699 provides one Universal Serial Bus (USB) port. The port is available at the CPCI backplane connector.

KEYBOARD AND MOUSE PORTS — The VMICPCI-7699 supports a combined PS/2 keyboard and mouse connector for peripherals. A **Y**-adapter cable is supplied with the unit.

FLASH MEMORY —The VMICPCI-7699 provides up to 96 Mbyte of CompactFlash memory accessible through the secondary IDE port. The VMICPCI-7699 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-7699 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-7699 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.

NONVOLATILE SRAM — The VMICPCI-7699 provides 32 Kbyte of nonvolatile 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-7699. Only the on-board VMICPCI-7699 logic will be reset. There will be no reset generated on the CPCI bus. Six LEDs are visible on the front panel: +5 V power, board status, IDE activity, LAN activity, LAN Mode (10 or 100 MHz mode), and hot-swap status. A small speaker is also included on the VMICPCI-7699 to provide PC/AT sound output.

PMC EXPANSION SITES — The VMICPCI-7699 supports the IEEE P1386 common mezzanine card specification with two 5 V PCI mezzanine card expansion sites. PMC I/O is routed to the CPCI backplane 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, 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.

CPCI bus BRIDGE — The VMICPCI-7699 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-7699 Pentium II processor to configure and control the on-board local subsystem independent from the CPCI bus host processor. The VMICPCI-7699 local PCI subsystem is presented to the CPCI bus host as a single CPCI device.

The VMICPCI-7699 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 CPCI (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

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Configuration Registers and CSRs

- Two sets of standard PCI configuration registers corresponding to the local and CPCI interfaces. Each set is accessible from either the local or CPCI 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-7699. 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-7699, but is very useful in those cases where the driver for peripheral devices is not available.

The generic hardware driver is a set of functions and utilities that makes it possible to easily develop, debug, and run standard Windows NT/Windows 2000 applications that access any PC Card (PCMCIA), PMC, and CPCI 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 BSP for VMIC's series of CPCI Pentium processor-based computers that is required to run the VxWorks OS. With the SBC, VxWorks, the BSP, and other CPCI 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 CPCI 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 CPCI bus.

QNX, LynxOS, and Solaris

QNX, LynxOS, and Solaris 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 Connectors:

5 V signaling, types 1 and 2

32-bit PCI bus, 33 MHz maximum

COMPATIBLE PRODUCTS

PMC Expansion Sites: VMIC supports the PMC expansion sites with its VMIPMC-5579 Reflective Memory interfaces. Reflective Memory is VMIC's family of networking products that provides high-speed network communication 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.

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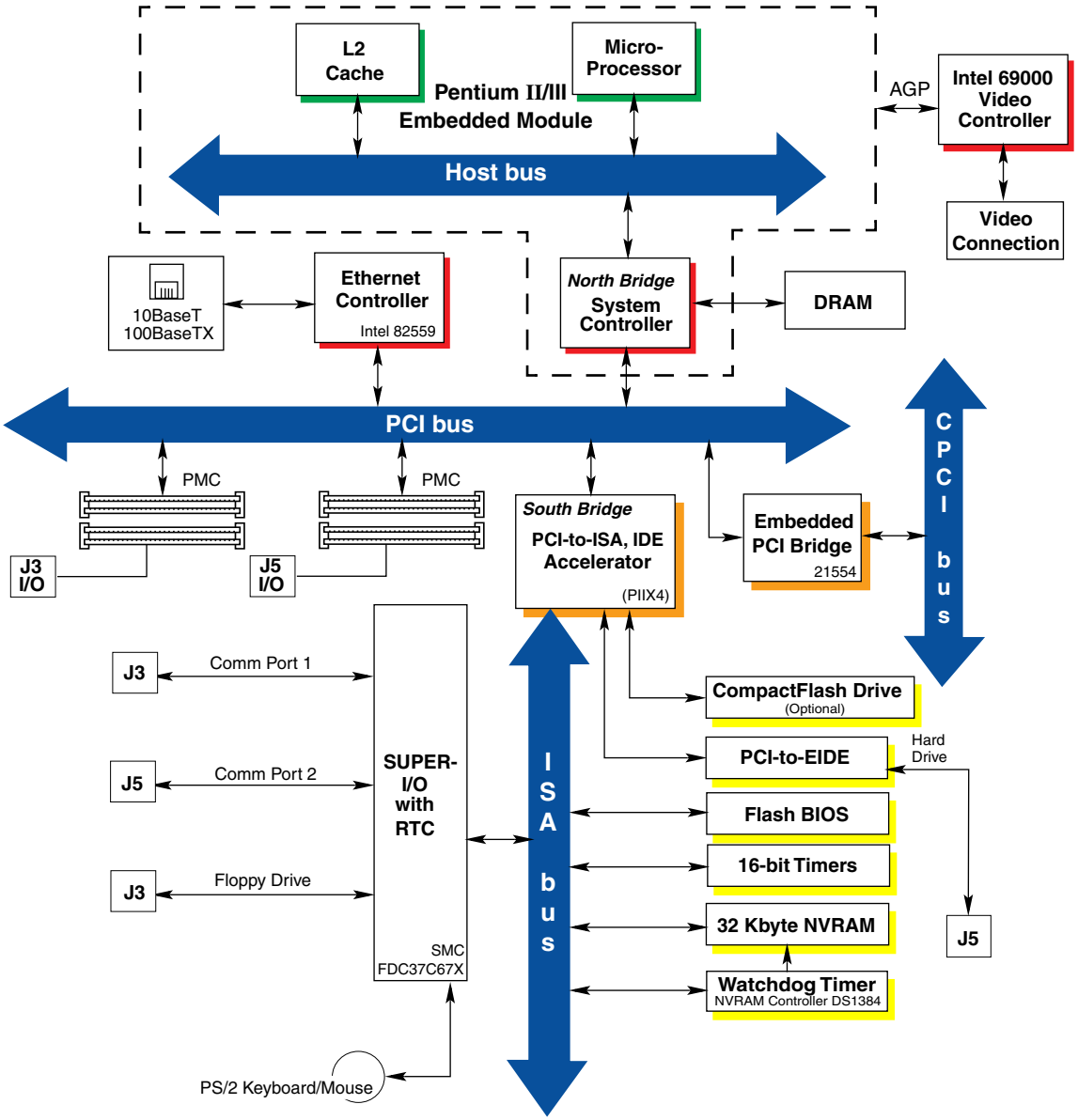


Figure 1. VMICPCI-7699 Block Diagram

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