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This product is not recommended for new designs. This specification is not being maintained.
Some options listed may no longer be available and some information may be obsolete.

VMIVME-7591

Single-Slot Pentium Processor-Based VMEbus Single-Board Computer with PMC

- Single-slot Pentium® processor-based single-board computer (SBC) with PMC site
- Special features for embedded applications include:
  - — Remote Ethernet booting using Lanworks Technologies, Inc.'s Bootware®
  - — Three programmable 16-bit timers
  - — 32 Kbyte of battery-backed SRAM
  - — Software-selectable watchdog timer with reset
  - — VMEbus P2 connection to HD/floppy drive
  - — PMC mezzanine expansion site (IEEE-P1386 common mezzanine card standard, 5 V)
  - — Universe II high-performance VMEbus interface
  - — VME64 modes supported: A32/A24/D64/D32/D16/D08(EO)/MBLT64/BLT32
  - — VMEbus interrupt handler, interrupter, and system controller
  - — Includes real-time endian conversion hardware for little-endian and big-endian interfacing (patent no. 6,032,212)
  - — Enhanced bus error handling
  - — Passive cooling option
  - — CE mark
- Standard features include:
  - — Pentium processors with speeds up to 233 MHz (with MMX™)
  - — External (L2 cache - 512 Kbyte synchronous burst SRAM
  - — Up to 256 Mbyte SDRAM using 144-pin SODIMM
  - — 64-bit PCI SVGA controller with 2 Mbyte SGRAM
  - — On-board Fast Ethernet controller supporting 10BaseT and 100BaseTX
  - — On-board Ultra-DMA-33 hard drive and floppy drive controllers
  - — Two high-performance 16550-compatible serial ports * (Requires VMIACC-0045 or individual connector adapters.)
  - — PS/2-style keyboard and mouse port combination on front panel
  - — Real-time clock and miniature speaker included
- Operating System support
  - — Windows NT®/Windows® 2000
  - — VxWorks
  - — QNX
  - — Solaris
  - — Linux
  - — LynxOS

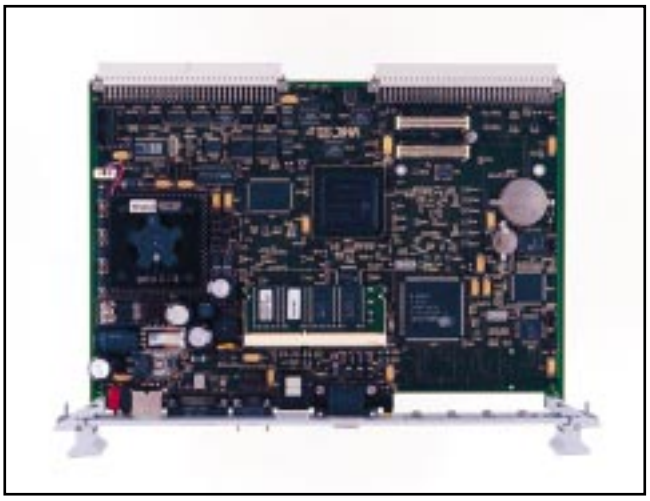
APPLICATIONS

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

MICROPROCESSOR — The VMIVME-7591 brings Intel® Pentium processor power to VMEbus, offering processor speeds up to 233 MHz with MMX.

The Pentium processor includes 32-bit addressing and a 64-bit data bus. Its superscalar architecture utilizes two pipelined integer units and a pipelined floating-point unit, allowing two instructions to be executed per clock cycle. A dynamic branch prediction unit and separate instruction and data caches also increase the Pentium processor's performance.

EXTERNAL (L2) CACHE MEMORY — The VMIVME-7591 complements the Pentium processor with 512 Kbyte of external cache memory. Near-zero wait state operation of the processor is ensured by the use of synchronous burst static RAM with the Intel chipset.



DRAM MEMORY — The VMIVME-7591 accepts one 144-pin SODIMM module for a maximum memory capacity of 256 Mbyte SDRAM. The on-board SDRAM is dual ported to the VMEbus.

BIOS — System BIOS, Lanworks Technologies, Inc.'s BootWare, and video BIOS are provided in reprogrammable flash memory.

SUPER VGA CONTROLLER — High-resolution graphics and multimedia-quality video are supported on the VMIVME-7591 by the Cirrus Logic CL-GD5480 PCI graphics adapter. The CL-GD5480 is complemented by 2 Mbyte synchronous graphics DRAM with a high-bandwidth 64-bit data interface. Screen resolutions up to 1,280 x 1,024 x 256 colors (noninterlaced) are supported by the CL-GD5480 graphics adapter.

Ethernet CONTROLLER — The VMIVME-7591 supports Ethernet LANs with the DEC 21143 PCI Ethernet controller. 10BaseT and 100BaseTX options are supported via a front panel RJ45 connector.

SERIAL PORTS — Two 16550-compatible serial ports are featured on the VMIVME-7591 front panel. Each serial channel has an independent 16-byte FIFO to support baud rates up to 56 kHz. Requires VMIACC-0045 or individual connector adapters.

ULTRA-DMA-33/FLOPPY DRIVE CONTROLLERS — The VMIVME-7591 uses VMEbus P2 rows A and C for IDE/floppy drive connectivity. VMIC's VMIVME-7452 floppy/hard disk module may be used to provide floppy/hard disk functionality or the VMIACC-0560 P2 transition module may be used. This VMIACC-0560 connects the P2 rows A and C IDE/floppy connections to standard 40- and 34-pin HDD/floppy headers.

ENHANCED PARALLEL PORT — Also accessible on the VMIVME-7591 front panel 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 VMIACC-0045 or individual connector adapters.

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Ordering Options								
August 17, 2000 800-007591-000 G		A	B	C	–	D	E	F
VMIVME-7591	–				–			

A = Processor
- 0 = Not Used
- 1 = Reserved
- 2 = Reserved
- 3 = Reserved
- 4 = 200 MHz Pentium Processor with MMX
- 5 = Reserved
- 6 = Reserved
- 7 = 166 MHz Pentium Processor
- 8 = Reserved
- 9 = 233 MHz Pentium Processor with MMX

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

C = Interface
- 0 = Reserved
- 1 = Single-Slot, Active Cooling
- 2 = Dual-Wide (Two-Slot), Passive Cooling
- 3 = Reserved
- 4 = Reserved
- 5 = Reserved

Companion Single-Slot VMEbus Floppy/Hard Disk Module

		A	B	C	–	D	E	F
VMIVME-7452	–	5			–			

A = 5
BC = Indicates Disk Module Configuration
(See the VMIVME-7452 specification for details on disk module configuration options.)

Connector Adapter Kit

*** VMIACC-0045**

An accessory kit is available that adapts the product's front panel 9-pin serial and 25-pin parallel port Micro-D connectors to Standard-D size 9- and 25-pin connectors. The Connector Adapter Kit contains two 9-pin Micro-D to Standard-D serial port adapters and one 25-pin Micro-D to Standard-D parallel port adapter. Individual connector adapters: 360-010050-000 Micro-DB9 to DB9 and 360-010051-000 Micro-DB25 to DB25. **These adapters and accessory kit are 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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KEYBOARD AND MOUSE PORTS — The VMIVME-7591 provides a combination PS/2 keyboard and mouse connector. A Y-cable is provided for separate keyboard and mouse connections.

FLASH MEMORY — The VMIVME-7591 provides 16 Mbyte of flash memory accessible through the secondary IDE port. The VMIVME-7591 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.

REMOTE Ethernet BOOTING — The VMIVME-7591 utilizes Lanworks Technologies, Inc.'s BootWare. BootWare provides the ability to remotely boot the VMIVME-7591 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

16-bit TIMERS — The VMIVME-7591 provides the user with three 16-bit timers which are 82C54 compatible. These timers are mapped in ISA I/O space, and are completely software programmable. All three timers use a 1 MHz time base; jumperable for 2 MHz.

WATCHDOG TIMER — The VMIVME-7591 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 a watchdog timeout will occur.

A jumper allows the watchdog timeout to be configured to cause a board reset, Nonmaskable Interrupt (NMI), or neither. Independently of the user jumper, software can enable a VMEbus *SYSFAIL circuit. If enabled, the watchdog timeout will cause assertion of VMEbus *SYSFAIL.

BATTERY-BACKED SRAM — The VMIVME-7591 provides 32 Kbyte of battery-backed SRAM. The SRAM is accessible in ISA memory space. 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 VMIVME-7591. If the system controller is enabled, a SYSRESET* will also be generated on the VMEbus. Five LEDs are visible on the front panel: +5 V power, status of VMEbus SYSFAIL, IDE activity, LAN activity, and LAN Mode (10 or 100 MHz mode). A small speaker is also included on the VMIVME-7591 to provide PC/AT sound output.

PMC EXPANSION SITE — The VMIVME-7591 supports IEEE-P1386 common mezzanine card specification with a 5 V PCI mezzanine card expansion site. This expansion capability allows third-party devices to be used with the VMIVME-7591.

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

- Fibre Channel
- Reflective Memory
- Analog and digital I/O
- High-speed serial and parallel I/O
- Networking adapters: FDDI, ATM, 100BaseTX Ethernet, Fast Ethernet
- Video graphics accelerators

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- 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

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

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

VMEbus INTERFACE — The VMIVME-7591 VMEbus interface is based on the Universe II high-performance PCI-to-VME interface from Tundra.

SYSTEM CONTROLLER — The on-board VMEbus system controller capabilities allow the board to operate as a slot 1 system controller, or it may be disabled when another board is acting as the system controller. The system controller may be programmed to provide the following modes of arbitration:

Round Robin (RRS)
Single Level (SGL)
Priority (PRI)

The system controller provides a SYSCLK driver, IACK* daisy-chain driver, and a VMEbus access timeout timer. The system controller also provides an arbitration timeout if BBSY* is not seen within a specified period after a BGOUT* signal is issued. This period is programmable for 16 or 256 µs.

The VMIVME-7591 autodetects whether it is inserted in slot 1 and configures itself as the system controller automatically.

VMEbus REQUESTER — The microprocessor can request and gain control of the bus using any of the VMEbus request lines (BR3* to BR0*) under software control. The requester can be programmed to operate in any of the following modes:

Release-On-Request (ROR)
Release-When-Done (RWD)
VMEbus Capture and Hold (BCAP)

MAILBOXES — The VMEbus interface provides four 32-bit mailboxes, which are accessible from both the microprocessor and the VMEbus providing interprocessor communication. The mailboxes have the ability to interrupt the microprocessor when accessed by VMEbus, and VMEbus interrupts may be generated on mailbox accesses from the SBC.

INTERRUPT HANDLER — The interrupt handler monitors, and can be programmed to respond to any or all VMEbus IRQ* lines. All normal-process VMEbus-related interrupts can be mapped to PCI INTA# or SERR# interrupts. These include:

Mailbox interrupts
VMEbus interrupts
VMEbus interrupter IACK cycle (acknowledgment of VMIVME-7591 VMEbus-issued interrupts)

All error processing VMEbus-related interrupts can be mapped to PCI INTA# or SERR#. Note: PCI SERR# initiates an SBC NMI. These include:

ACFAIL* interrupt
BERR* interrupt
SYSFAIL* interrupt

The interrupt handler has a corresponding STATUS/ID register for each IRQ* interrupt. Once the handler receives an IRQ*, it requests the VMEbus and, once granted, it performs an IACK cycle for that level. Once the IACK cycle is complete and the STATUS/ID is stored in the corresponding ID register, an appropriate interrupt status bit is set in an internal status register, and a PCI interrupt is generated. The PCI interrupt can be mapped to PCI INTA# or SERR#.

INTERRUPTER — Interrupts can be issued under software control on any or all of the seven VMEbus interrupt lines (IRQ7* to IRQ1*). A common ID register is associated with all interrupt lines. During the interrupt acknowledge cycle, the interrupter issues the ID to the interrupt handler.

The interrupter can be programmed to generate a PCI INTA# or SERR# interrupt when a VMEbus interrupt handler acknowledges a software-generated VMEbus interrupt.

REAL-TIME ENDIAN CONVERSION — The Intel 80x86 family of processors use little-endian format. To accommodate other VMEbus modules which transfer data in big-endian format such as the 680x0 processor family, the VMIVME-7591 incorporates endian conversion hardware. This provides independent endian conversion for both the Master and Slave interfaces. Both Master and Slave interface endian conversions are under software control.

MASTER INTERFACE — MA32:MBLT32:MBLT64 (A32:A24:A16:D32:D16:D8 (EO):BLT32)

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The VMEbus master interface provides nine separate memory windows into VMEbus resources. Each window has separate configuration registers for mapping PCI transfers to the VMEbus (that is, PCI base address, window size, VMEbus base address, VMEbus access type, VMEbus address/data size, etc.). The maximum/minimum window sizes for the nine windows are as follows:

Window	Minimum Size	Maximum Size
0, 4	4 Kbyte	4 Gbyte
1 to 3, 5 to 7	64 Kbyte	4 Gbyte
Special Cycle	64 Kbyte	64 Mbyte

SLAVE INTERFACE — Memory Access SAD032:SD32:SBLT32:SBLT64 (A32:A24:A16:D32:D16:D8 (EO): BLT32)

The VMEbus slave interface provides eight separate memory windows into PCI resources. Each window has separate configuration registers for mapping VMEbus transfers to the PCI bus (that is, VMEbus base address, window size, PCI base address, VMEbus access type, VMEbus address/data size, etc.). The maximum/minimum window sizes for the eight windows are as follows:

Window	Minimum Size	Maximum Size
0	4 Kbyte	4 Gbyte
1 to 3	64 Kbyte	4 Gbyte
4	4 Kbyte	4 Gbyte
5 to 7	64 Kbyte	4 Gbyte

In addition, each window can be programmed to operate in coupled or decoupled mode. In decoupled mode, the window utilizes a write-posting FIFO and/or a read prefetching FIFO for increased system performance. In coupled mode, the FIFOs are bypassed and VMEbus transactions are directly coupled to the PCI bus (that is, transfers on VMEbus are not completed until they are completed on the PCI bus).

ENHANCED BUS ERROR HANDLING — Enhancements over the Universe chip's bus error handling features are provided. A latch and register are provided to allow the SBC to read the VMEbus address that caused a bus error in all modes. The Universe chip's support is limited to coupled mode.

Support for bus cycle timeout and assertion of bus error is provided. The board may be configured to assert bus error upon timeout regardless of its status as system controller. The Universe chip asserts bus error only if it is system controller. In addition, this board may be configured to assert an interrupt upon bus cycle timeout.

PASSIVE COOLING OPTION — A factory option is available that replaces the standard fan sink on the processor with a large passive heat sink. This larger heat sink protrudes into a second VME slot, therefore, a double-wide front panel is provided with this option.

OPERATING SYSTEM AND SOFTWARE SUPPORT — The VMIVME-7591 provides embedded features beyond PC/AT functionality. These features are supported by VMIC software products 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.

VMISFT-9420 VMEbus Access™ for Windows NT/Windows 2000 — The VMEbus Access product is specifically designed for accessing the advanced VMEbus architecture of the VMIVME-7591. Running on Windows NT/Windows 2000, VMEbus Access is both sophisticated and easy to use.

The function library, VMEbus toolset, and open architecture VMEbus Access offers make it one of the most powerful products on the market today. It provides compatibility with existing VMIC VMEbus PC platforms and compatibility with future VMEbus PC platforms VMIC creates.

The VMEbus Access development package gives you everything you need to develop applications for your VME operations. This package includes the *VMEmanager*™ function library and four utilities that enable you to easily configure a VMEbus, dynamically monitor VMEbus activities, manage VMEbus data, and use DDE-client applications.

VMEbus Access provides powerful tools for developing, debugging, and monitoring VMEbus applications and increasing VMEbus performance. The flexible design of VMEbus Access enables you to incorporate it as a stand-alone solution, or use it to open your VMEbus operations to the IOWorks® product suite.

VMEbus Access manipulates the hardware behind the scenes. With VMEbus Access, you can develop applications in or use existing applications developed in most programming environments. For example, VMEbus Access enables your VMEbus to recognize applications developed in these popular programming environments:

- IOWorks Manager™
- LabView
- Citect
- Wonderware InTouch
- Visual IOWorks®
- Visual Basic®
- Visual C++®

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VxWorks OS SUPPORT

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

The BSP is linked 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 transceivers are all supported, as well as floppy and IDE hard disk drives that can be connected to the computer boards. The BSP provides Flash boot, NVRAM, and timer support.

The BSP allows VxWorks applications to have access to the VMEbus. When hardware includes single cycle and block transfers using DMA devices, they are supported by the BSP, as well as interprocessor communications with mailbox registers. VMEbus interrupt handling and error handling are supported. Since the VMEbus environment often contains a mixture of devices from various manufacturers, the byte-swapping feature is provided to allow big-endian and little-endian devices to share data correctly.

QNX OS SUPPORT

VMISFT-7417 BOARD SUPPORT PACKAGE — The VMISFT-7417 BSP provides QNX support and includes a VMEbus manager, user API, and configuration files needed to run the QNX BSP on VMIC's VMVME-7xxx SBC products. This BSP provides a customizable VMEbus access. Using the QNX OS on the VMIVME-7xxx SBCs provides a computing platform suitable for real-time applications. QNX provides the applications programmer with a real-time extensible POSIX OS. VMIC's VMISFT-7417 is designed to tailor QNX's x86 OS to the VMIVME-7xxx platform. This combination provides a self-hosted development environment which runs entirely on the VMIVME-7xxx SBC boards without requiring any external host systems.

Solaris OS SUPPORT

VMISFT-7416 BOARD SUPPORT PACKAGE — The VMISFT-7416 BSP includes everything necessary to allow installation of the Solaris Intel edition OS (available separately from Sun Microsystems, Inc.) onto VMIVME-7591 SBC. This BSP includes a nexus driver for VMEbus access. It allows military, telecommunications, and other applications to take advantage of Sun Microsystems, Inc.'s Solaris OS on a VMEbus-based Intel SBC. This BSP and the Solaris OS provides POSIX-compliant real-time characteristics.

LynxOS x86 OS SUPPORT

VMISFT-7419 BOARD SUPPORT PACKAGE — The VMISFT-7419 BSP includes all of the device drivers and configuration tables needed to install the LynxOS x86 development system (available separately from Lynx Real-Time Systems, Inc.) onto VMIC's VMIVME-7591.

Using the LynxOS on the VMIC SBCs provides a computing platform suitable for hard real-time applications. LynxOS provides the applications programmer with a stable development environment based on industry-wide standards such as POSIX and Motif.

I/O SUPPORT

VMISFT-9450 IOWorks BOARD DRIVERS — This driver supports VMIC's extensive line of VME I/O boards, and is available for Windows NT/Windows 2000 and VxWorks. IOWorks board drivers take advantage of all the key benefits and features of each supported I/O board, and new I/O boards are constantly being added.

IOWorks board drivers contain both a C++ class library and a C function library that provide a common interface to VMIC I/O products for reading, writing, and configuring. You do not need to know the details of how an individual board is programmed. For instance, you can use the SetAttributes function on any supported VMIC board; the WriteAnalog function controls the output from any VMIC analog output board; or the GetScanMode function retrieves the scan mode for any VMIC analog board.

SPECIFICATIONS

6U single 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), 6 A (typical), 8.5 A maximum

+12 VDC (±5 percent), 105 mA (typical), 150 mA maximum

-12 VDC (±5 percent), 25 mA (typical), 50 mA maximum

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

Operating Temperature (Forced air cooling required):

0 to 50 ˚C	200 to 300 MHz Pentium processor options

Relative Humidity: 10 to 90 percent, noncondensing

Safety: The VMIVME-7591 was inspected and found compliant with the safety criteria of BSI/EN 60950.

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Electromagnetic Compatibility (ECM): This product was tested in a representative EMC system to the following standard: CE Mark per European EMC Directive 89/336/EEC with Amendments; Emissions: EN55022 Class B; Immunity: EN61000-4.

MTBF: 39,259 hours minimum (217F)

VMEbus Interface:

DTB Master:	BLT32/BLT64, A32/D32, A24/D32, A16/D32
DTB Slave:	BLT32/BLT64, A32/D32, A24/D32, A16/D32
Requester:	Programmable, BR(3 to 0), ROR,RWD, BCAP
Interrupt Handler:	IH(1 to 7) D8(O)
Interrupter:	Programmable, IRQ7* to IRQ1*
Arbiter:	SGL, PRI, RRS
BTO:	Programmable (16 to 1,024 µs)
Compliance:	Rev. C.1

PMC Mezzanine:

5 V signaling, types 1 and 2
32-bit PCI bus, 33 MHz maximum

COMPATIBLE PRODUCTS

Hardware: The VMIVME-7591 can be used with a number of VMIC's PMC bus and VMEbus products.

Floppy/Hard Disk: VMIC produces floppy/hard drive modules to support the built-in IDE and floppy controller ports.

The VMIVME-7452 provides hard disk storage and a 3.5-inch 1.44 Mbyte floppy drive. The unit fits into a standard VMEbus 6U single-slot form factor.

The VMIACC-0562 converts the VMIVME-7591 P2 IDE/floppy signals to 40- and 34-pin headers for use at the rear of the VMEbus backplane.

PMC Expansion Site: The PMC expansion site description and compatible PMC products are shown on page 3 of this specification.

CD-ROM Support: Since much of today's advanced software is delivered on CD-ROM, the VMIVME-7455 CD-ROM provides CD-ROM capability within a single 6U VME slot.

I/O Products: The VMIVME-7591 enables access to VMIC's wealth of VMEbus products. If you have real-world control, monitoring, and real-time networking requirements, VMIC has a solution for you. Today's system requirements demand state-of-the-art solutions. Our advanced I/O features such as Built-in-Test, self-test, isolation, digital autocalibration, and intelligent on-board DSP processing give our customers those solutions.

Analog Input:
- Up to 64 channels
- 12- and 16-bit ADC
- Isolation
- Differential and single-ended
- Low- and high-speed sampling rates
- Programmable gains and filters
- Simultaneous sample-and-hold
- Autocalibration
- Signal conditioning: RTD, strain gauge, and thermocouples

Analog Output:
- Up to 32 channels
- 12- and 16-bit ADC
- Isolation
- Voltage and current outputs
- Programmable function generator

Digital Input:
- Up to 128 channels per board
- Change-of-state and time tagging
- Isolated
- Contact and voltage sensing
- Pulse accumulators
- AC and DC inputs up to 240 V
- TTL, RS-422, or RS-485

Digital Output:
- Up to 128 channels
- TTL and high voltage
- Isolated
- Solid-state and mechanical relays, latching or momentary
- Programmable function generator
- Real-time and off-line fault detection and isolation

Chassis and Power Supplies: VMIC provides a number of chassis and table top enclosures to complete your installation. A variety of power supplies are available to suit your system needs.

IOWorks for Industrial Automation and Test and Measurement: IOWorks is a modular IEC 61131-3-compliant component PC control software product designed to support just about any I/O requirement for industrial automation and test and measurement. The IOWorks control strategy was designed around PC platform and operating system independency to provide you with the highest performance solutions based upon open architecture and open software standards. Software standards such as OPC, OLE, ODBC, and DDE provide significant flexibility and expandability. IOWorks software, coupled with open architecture solutions, provides the ideal solution for applications where supportability, cost, and performance coupled with *designed* in migration paths to protect your software investment is critical. Request a copy of the PC-Based Control Software catalog for more information.

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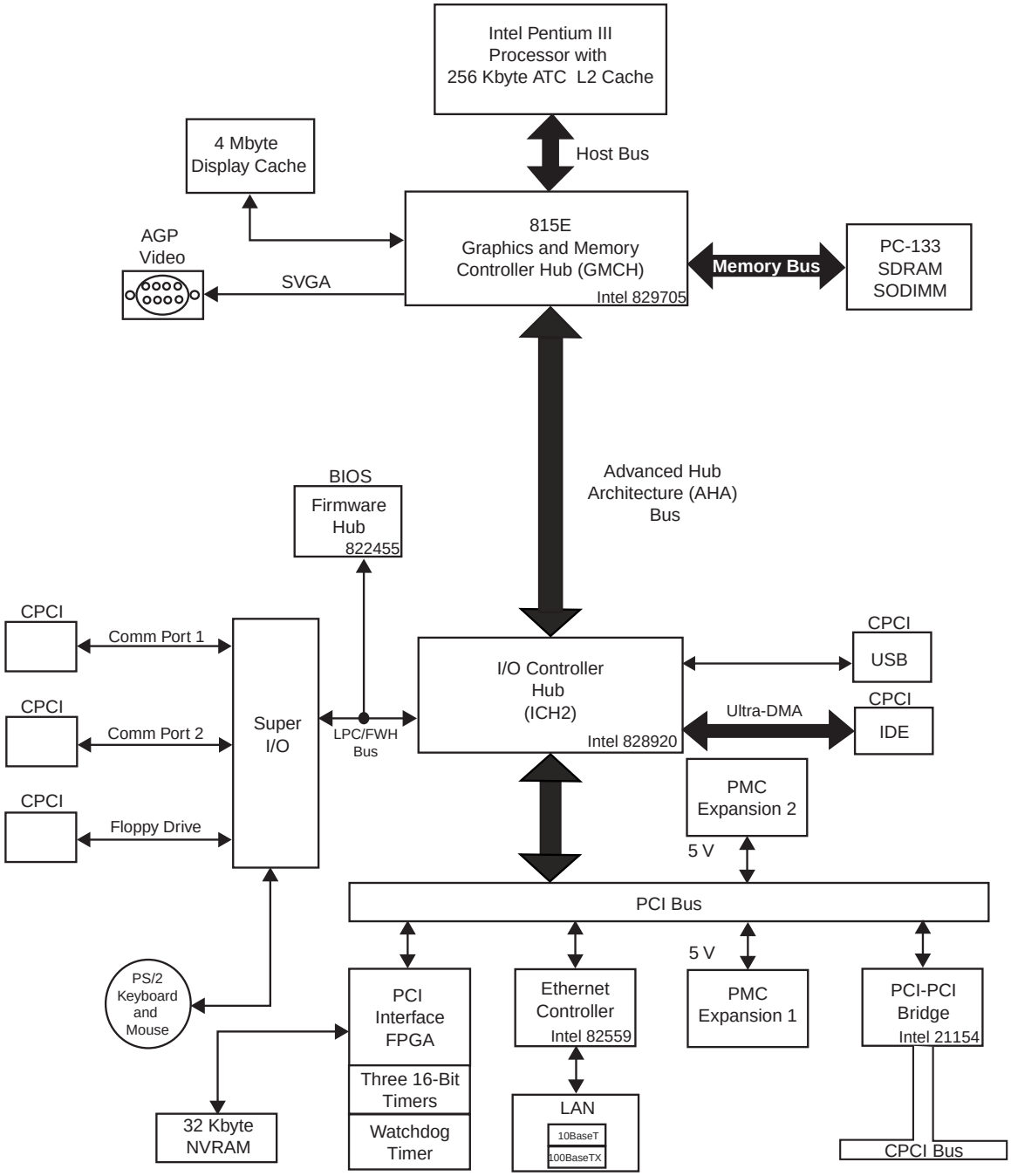


Figure 1. VMIVME-7591 Block Diagram

TRADEMARKS

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