# VMICPCI-8420
# IOWorks® PC-Based Controller

## HARDWARE FEATURES

- Available with IOWorks® PC-based control software for VxWorks or Windows NT®
- Turnkey PC-based controller
- Includes either (1) an AMD-K6-2 3DNow 400 MHz single-board computer (SBC) processor, (2) an Intel® Pentium® 233 MHz MMX™ SBC, or (3) an Intel Pentium III 850 MHz (minimum) all with a fan and heat sink. Both SVGA video and 10BaseT Ethernet are standard in the first two systems; 100BaseT Ethernet is standard with the Pentium III system.
- Open architecture CompactPCI® solution for industrial applications
- Support for a wide range of VMIC I/O boards
- Up to seven available CompactPCI slots for customer-specific I/O boards with the Intel Pentium III processor
- Interface devices include a 10.0 Gbyte hard disk drive and a 3.5-inch 1.44 Mbyte floppy disk drive. Parallel port interface cable for an external CD-ROM drive is standard, along with a front panel 40-pin EIDE connector for an external CD-ROM or added HDD.
- Memory: 128 Mbyte of SDRAM is standard for the first two systems; 256 Mbyte is standard for the Pentium III system
- Includes 512 Kbyte pipeline cache memory size
- Includes two serial ports, an ECP/EPP bidirectional parallel port, two USB ports, an EIDE hard disk interface connector, and a mini-DIN PS/2 connector for keyboard and mouse
- The system enclosure is a rugged structure designed for rack-mounted applications. Included is a 320 W power supply. Front panel has an ON/OFF key switch along with LED status lights for power ON activity. The enclosure contains a new backplane capable of supporting Full Hot-Swap capability.

## SOFTWARE FEATURES

- Windows NT and VxWorks operating systems
- VMIC CompactPCI I/O driver software
- IEC 61131-3-compliant programming languages: ladder-logic diagrams, functional block
- Diagrams, structured text, instruction lists, and sequential function charts (Relay ladder logic and function block diagrams available now. Others available in future releases.)
- User-defined function blocks
- Other CPU speeds support up to six CompactPCI I/O boards
- Large libraries of components (PID, lead/lag, etc.)
- Build, download, and execute software in distributed control and monitoring systems
- ODBC, OLE, OPC, and DDE provide open connectivity from sensor data to your control room and beyond
- Display of equipment error and status information
- Forcing of data points
- Debug utilities
- Expandable IOWorks modules to support
  - — Third-party I/O
  - — HMI/SCADA
  - — Reflective Memory
  - — Multiprocessors
  - — Field bus connectivity (See VMISFT-9455)

**INTRODUCTION** — The VMIC VMICPCI-8420 industrial CompactPCI PC-based controller is a high-performance industrial control platform, featuring VMIC's award-winning IOWorks PC-based control software operating with VxWorks or Windows NT OS. This system is designed to offer a cost-effective PC-based controller solution. The system enclosure is an industrial class chassis specially designed for 19-inch rack mount applications. It can also be used as a bench top system, and is designed for easy maintenance.


**Powered by**

IOWorks® by VMIC

| Ordering Options | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Nov. 19, 2001 800-658420-000 F | A | B | C | – | D | E | F | |
| VMICPCI-8420 | – | | | | – | | | |

**A = SBC Processor Options**
- 0 = Intel Pentium MMX 233 MHz
- 1 = Reserved
- 2 = Reserved
- 3 = Reserved
- 4 = AMD-K6-2 3DNow 400 MHz (Minimum)
- 5 = Intel Pentium III 850 MHz (Minimum)

**B = Controller Software/Operating System Options**
- 0 = IOWorks Target/VxWorks
- 1 = IOWorks Target/Windows NT
- 2 = IOWorks Development/Windows NT
- 3 = Windows NT
- 4 = No Software/Operating System Installed

**C = Ethernet Capability Options**
- 0 = 10BaseT Ethernet Capability
- 1 = 10/100BaseT Ethernet Capability
- 9 = Reserved

**Notes**

The I/OWorks Target/VxWorks option includes one run-time license. A special, highly accurate timing board, the VMIPMC-7441, is standard with the VxWorks option. This board, along with its adapter card, comes with 16 Mbyte of M-Systems DiskOnChip memory standard. The adapter card uses one of the available CompactPCI slots in the system.

**For connection to third-party I/O and field buses, see the VMISFT-9455 specification.**

**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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This complete system can come preloaded with IOWorks PC-based control software and the operating system platform VxWorks, or the user can select the Windows NT OS. Some of the features of IOWorks include the following:

- User-friendly IEC 61131-3 visual development environment: applications based on Windows NT OS
- Deterministic hard real-time control capability: typical scan rates of <1 ms with VxWorks
- User-defined function blocks: Support for user-written C/C++ functions
- Available support for multiple I/O types: ISA/PCI, DeviceNet, Profibus, Allen-Bradley Remote I/O, Modbus/Modbus+, MTL I/O95, Optomux, RS-COM, GE Genius®, and others

The 8420 series controllers bring VMIC's 16 years of real-time embedded control experience, state-of-the-art PC-based platforms, I/O choices, and IEC 61131-3 programming standards together in a turnkey package for the user.

IOWorks is a PC-based control package providing flexible, user-friendly PC control and monitoring software. The 8420 can be used as an embedded system or as a distributed control system; like PLCs. Embedded systems provide for the development and execution of control programs on the same platform. Embedded configurations are restricted to Windows NT platforms with optional hard real-time enhancements. As a distributed system, supported operating systems include Windows NT and VxWorks.

IOWorks provides a programming environment familiar to the experienced engineer. By adhering to the internationally recognized IEC 61131-3 programming specification, users can develop their application using Ladder Logic, Function Block Diagrams, Structured Test, or Flowcharting. Online tools like monitoring, single step and debug, and program online editing are provided by IOWorks to speed program development. Standard interfaces allow users to deploy off-the-shelf tools to the 8420, such as Visual Basic®, ODBC, DDE, FastDDE, and OLE for Process Control (OPC).

## FUNCTIONAL CHARACTERISTICS

**Single-Board Computer:** Either: (1) a single Intel Pentium 233 MHz SBC processor with MMX, (2) an AMD-K6-2 3DNow 400 MHz (minimum) SBC processor, or (3) an Intel Pentium III 850 MHz (minimum) CPU processor

**Graphics:** On-board (SBC card) SVGA video with up to 4 Mbyte shared system memory with 1,600 x 1,280 pixels (256 colors) 60 Hz, or 1,024 x 768 pixels, true color, 75 Hz (maximum resolution)

**Power Supply:** Internal 320 W minimum (autoranging)

**System Memory:** 128 Mbyte (100 MHz) SDRAM (standard) using 144-pin mini-DIMM sockets standard for 233 and 400 MHz systems; 256 Mbyte is standard with the Pentium III system

**Flash Memory:** 16 Mbyte of on-board DiskOnChip® from M-Systems, Inc. is standard with the VxWorks option (B = 0)

**System Disk Drive:** One 3.5-inch, 10.0 Gbyte (or greater) IDE hard disk drive with a 66 Mbyte/s internal transfer rate (minimum) and a 9.0 ms average seek time, or greater is standard

**Floppy Disk Drive:** 3.5-inch double density, *notebook* size, 1.44 Mbyte capacity (standard)

**Option Slots:** Seven available CompactPCI expansion slots with the Intel Pentium III CPU option. Other CPU speed options support up to six I/O boards. If the optional 10/100BaseT Ethernet capability is used with the 233 or 400 MHz CPU option, the total available CompactPCI slots is reduced by one. Note: The VxWorks option comes standard with the VMIPMC-7441, a highly accurate timing board. This board uses one of the available CompactPCI slots.

**Ports:** Two (16C550) 9-pin serial ports (one RS-232, one RS-422/-485), two USB ports, one ECP/EPP 25-pin bidirectional parallel port (including cable), one mini-DIN PS/2 connector for keyboard and mouse (including adapter), a 10/100BaseT Ethernet connector, and an EIDE hard disk interface using a front panel 40-pin EIDE connector (for external CD-ROM or HDD).

**Backplane:** Supports up to seven separate CompactPCI card slots with Full Hot-Swap capability, according to PICMG® 2.1 R2.0

## PHYSICAL/ENVIRONMENTAL

**Temperature:** 0 to 60 ˚C operating range

**Relative Humidity:** 50 percent (noncondensing); 5 to 95 percent (noncondensing) recommended operating range

**Chassis Dimensions:**
Width: 19.0 in.
Depth: 9.8 in.
Height: 5.2 in.
Weight: 21 lb (net)

## ELECTRICAL CHARACTERISTICS

**Voltage:** AC 90 to 132 V, or 180 to 264 V

**Frequency:** 43 to 63 Hz

**Power Requirements (SBC Board):** +5 V at 6 A; +12 V/-12 V at 20 mA

**Certification:** CE/FCC

## AVAILABLE PRODUCTS

The following VMIC I/O products for the VMICPCI-8420 system are currently available:

1. VMICPCI-1335: 16-Channel CompactPCI Optically Coupled Digital Input Board
   - 16 optically coupled inputs
   - High isolation potential — 1.5 kV sustained
   - 500 V galvanic isolation (channel-to-channel)
   - 8-, 16-, and 32-bit data transfers
   - Voltage or contact sensing inputs
   - Input ranges of 5 to 125 VDC
   - Compliant with PCI local bus specification

2. VMICPCI-2335: 16-Channel CompactPCI Optically Coupled Digital Output Board
   - 16 optically coupled inputs
   - High isolation potential — 1.5 kV sustained
   - Galvanic isolation to 500 V sustained in current sinking mode
   - 8-, 16-, and 32-bit data transfers
   - 50 V maximum output voltage
   - Supports Built-in-Test
   - Compliant with PCI local bus specification

3. VMICPCI-3322: 16-Channel 16-bit CompactPCI Analog-to-Digital Converter (ADC) Board
   - PCI local bus compliant
   - 24 differential or single-ended inputs
   - 16-bit A/D conversion
   - Aggregate conversion rate 99.5 kHz
   - Program-selectable scanning of 8, 16, or 24 channels
   - Sequentially digitizes selected channels and stores results in RAM register
   - Jumper-selectable A/D ranges of 0 to +5 V; 0 to + 10 V; ±2.5 V; ±5 V; ±10 V
   - Optional low pass filters
   - Overvoltage protected circuits
   - Selectable output coding

4. VMICPCI-4320: 8-Channel CompactPCI Analog Output Board
   - 8 analog output channels
   - Jumper-selectable voltage outputs
   - Output ranges of 0 to +5 V; 0 to +10 V; ±2.5 V; ±5 V; ±10 V
   - 12-bit resolution
   - Front panel outputs (P1)
   - On-board DC-to-DC converter
   - Complies with PCI local bus specification

5. VMICPCI-5579: Economical, High Capacity Reflective Memory
   - Real-time network for computers with CompactPCI, PCI, or PMC interfaces
   - Up to 64 Mbyte of Reflective Memory with network data rate up to 13.4 Mbyte/s
   - High-speed, easy-to-use fiber-optic network (270 Mbaud serially)
   - Data written to memory in one node is also written to memory in all nodes on the network
   - Data transferred at 13.4 Mbyte/s without redundant transfer
   - Data transferred at 6.7 Mbyte/s with redundant transfer
   - Any node on the network can generate an interrupt in any other node on the network or in all network nodes with a single command
   - No processor overhead

System configuration and test for the VMICPCI-8420 is available with any of the above products.

## SOFTWARE MAINTENANCE

A software service agreement is included with your software shipment. The agreement enables you to receive product updates and VMIC customer service. To purchase maintenance/service for your software product, send VMIC the completed form using the address indicated.

You receive 30 days free maintenance with your purchase. After that time you must purchase a maintenance agreement in order to receive customer service. The policies are good for one year and are renewable each year. VMIC will notify you when your agreement is about to expire.

When you call the 800 customer service phone number, you must give your service representative the product serial number to receive customer support. You can find this serial number on the back of the CD jewel case, or on the invoice.

To order annual maintenance for IOWorks products, use the prefix VMISWM- followed by the same ten digits as the product model number. For example, the part number for annual maintenance for VMISFT-9511-292-910, Visual Soft Logic Control, is VMISWM-9511-292-910.

Consulting services and training are available from VMIC.

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