VMEbus Interface Kits for PCI

VME-PCI8000 Series

Bidirectional transfers between the VMEbus and computer memory
High-performance DMA transfers
Maximum throughput across MXIbus
33 Mbytes/s burst
23 Mbytes/s sustained
Direct interrupt control
Optional dual-ported DRAM expansion
64 MB maximum on VME-MXI-2
16 MB maximum on PCI-MXI-2
Expandable to several VME or VXI mainframes using MXIbus
Works in B-size VXI systems

NI-VXI/VISA Software
Windows NT
Windows 98
Windows 95
Windows 3.1
HP-UX
Solaris 2
Mac OS

NI-VXI Software
DOS

Application Software
LabVIEW
LabWindows/CVI

Overview

The VME-PCI8000 Series interface kits link any PCI-based computer directly to the VMEbus (or B-size VXI) using the high-speed Multisystem eXtension Interface (MXI) bus. These kits make your computer perform as though it were plugged directly into the backplane, giving your external computer the capability of an embedded computer.

Each VME-PCI8000 Series kit includes one half-size PCI plug-in board, the PCI-MXI-2, which is installed in an available PCI slot in your computer; one 6U VME-MXI-2 Slot 1 module, which is installed in the leftmost slot in your VME chassis; a flexible MXI-2 cable; and NI-VXI/VISA interface software. The VME-PCI8000 Series are very similar to the VXI-PCI8000 Series, except they include the VME-MXI-2 Mainframe Extender instead of the VXI-MXI-2 Mainframe Extender.

The VME-PCI8000 kits feature integrated software, including intuitive tools for debugging and troubleshooting VME systems. With the comprehensive high-performance bus interface software and programming libraries, you can program multiple mainframe configurations yet maintain software compatibility across a variety of VME controller platforms.

Because the VME-PCI8000 kits are based on the standard MXIbus, they provide a bi-directional connection between a desktop computer and VME. Not only can your desktop computer directly address VME space, but also VME bus masters can directly access the memory and resources of the computer. With MXI you can also interconnect up to eight devices using MXI-2 cables up to 20 m in total length. You can expand your system by daisy chaining MXI cables to each VME-MXI-2 interface in each additional VME chassis.

The VME-PCI8000 Series kits achieve their superior performance by incorporating the MITE ASIC on the PCI-MXI-2 and the VME-MXI-2 boards. National Instruments developed the MITE custom ASIC to streamline the connection between PCI computers and workstations to both the MXI and the VXI/VME bus. Using the MITE, you can transfer data between the local computer memory and the VME device at a 33 Mbytes/s burst rate. You can consistently realize a 23 Mbytes/s sustained throughput rate for data transfers across the MXIbus.

The VME-PCI8000 Series kits are a flexible high-performance solution for stand-alone computer control of VXI systems. With a VME-PCI8000 Series kit, you combine the high-performance MXI interface with a low-cost, general-purpose desktop computer to achieve an attractive cost/performance solution compared to embedded VME controllers. If you use MXI as your control solution, you can upgrade your PC at any time to capitalize on the latest computer technology while using the same high-speed VME interface.

Hardware

The VME-PCI8000 Series hardware interfaces your PCI-based desktop computer to the VMEbus using the high-speed MXI standard . The VME-PCI8000 Series hardware includes two circuit boards, one for the computer and one for the VMEbus, and a MXI-2 cable. The PCI-MXI-2 interface board is a half-length PCI-compatible, plug-in circuit board that is installed

into one of the expansion slots on your computer. The VME-MXI-2 is a 6U VME module, which is installed in the leftmost slot in your VME chassis.

Computer Interface to and from VME

The PCI-MXI-2 and the VME-MXI-2 operate together to give your computer direct control over the VME chassis. From the PCI-MXI-2 and the VME-MXI-2 each have address mapping windows and work together with these windows to translate hardware bus cycles on the PCI local bus to hardware bus cycles on the VMEbus and vice versa.

Configuration

Using the T&M explorer software and VXIedit, you can set up the configuration of your system in an easy and timely manner. The NI-VXI/VISA Resource Manager completely configures the VME-MXI-2 at system startup so that its settings reflect the devices within the mainframe chassis. If the VME-MXI-2 determines that a cycle is intended for a device in its address space, then it takes control of the bus and translates the MXI cycle to a VME cycle. With NI-VXI/VISA, you can configure the hardware directly or you can use NI-VXI/VISA function calls to have the driver take care of these programming details for you.

Data Transfers to and from VME

On the PCI-MXI-2, the MITE ASIC connects the PCI bus to the MXIbus facilitating 32-bit transfers, accommodating PCI burst cycles, and achieving the highest performance possible on the PCI bus. The VME-MXI-2 interface accommodates 32, 16, and 8-bit transfers. The VME-MXI-2 also performs 64-bit data transfers using the VME64 protocol. Thus, the PCI-MXI-2 can transfer 32-bit data to the VMEbus using DMA and then transfer this data across the VMEbus in 64-bit words using VME64. The MITE takes care of the 32-bit to 64-bit translation automatically.

Software

The VME-PCI8000 Series kits come with NI-VXI/VISA software. NI-VXI/VISA includes an interface library that you can use with a number of popular programming environments and compilers, including Microsoft Visual C++, Borland C++, Microsoft Visual Basic, LabWindows/CVI, and LabVIEW. Application software developed using the VME-PCI8000 Series and the NI-VXI/VISA bus interface software is compatible with many other VME controller platforms, including embedded controllers and computers equipped with MXI interfaces. NI-VXI and VISA I/O software compatibility across platforms protects your software investment in the future.

Ordering Information

VME-PCI8015 *(Windows NT)*
- *with cable.....777244-02*
- *without cable.....777244-32*

VME-PCI8012 *(Windows 98/95)*
- *with cable.....777244-03*
- *without cable.....777244-33*

VME-PCI8010 *(DOS/Windows 3.1)*
- *with cable.....777244-01*
- *without cable*.....777244-31*

VME-PCI8040 *(Mac OS)*
- *with cable.....777244-04*
- *without cable.....777244-34*

VME-PCI8022 *(Sun/Solaris)*
- *with cable.....777244-05*
- *without cable*.....777244-35*

VME-PCI8024 *(HP-UX)*
- *with cable.....777244-06*
- *without cable.....777244-36*

** MXI-2 Cables – MXI-2 Cables can be ordered separately in lengths of 1, 2, 4, 8, 20 m. Refer to page 147.*

DRAM Options

PCI-MXI-2
- *4 MB.....920106-04*
- *16 MB.....920106-16*

VME-MXI-2
- *4 MB.....920112-04*
- *8 MB.....920112-08*
- *16 MB.....920112-16*
- *32 MB.....920112-32*
- *64 MB.....920112-64*

Phone: (512) 794-0100 • Fax: (512) 683-8411 • info@natinst.com • www.natinst.com