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6200
VME to PCI Interface Adapter
Installation Guide

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6200
VME to PCI Interface Adapter
Installation Guide

Document No. UG06200-000, REVA

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	Fax:	44 (0) 1869-247720
Asia / Pacific Rim:	Sales:	(81) 3-5423-6513
	Fax:	(81) 3-5423-6511
	Support:	(81) 3-5423-6514

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ftp.iphase.com

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Do Not Substitute Parts or Modify Equipment

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification of the equipment. Contact your local Interphase representative for service and repair to ensure that safety features are maintained.

Ground the Instrument

To minimize shock hazard, the equipment chassis and enclosure must be connected to an electrical ground. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter, with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet.

Do Not Operate in an Explosive Atmosphere

Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

Keep away from Live Circuits

Do not install or replace the component with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

Observe Dangerous Procedure Warnings

Warnings precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed. You should also employ all other safety precautions which you deem necessary for the operation of the equipment in your operating environment.

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Warning

This equipment generates, uses, and can radiate electromagnetic energy. It may cause or be susceptible to electromagnetic interference (EMI) if not installed and used in a cabinet with adequate EMI protection.

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Conventions

Icon Conventions

Icons draw your attention to especially important information:



Note

The Note icon indicates important points of interest related to the current subject.



Caution

The Caution icon brings to your attention those items or steps that, if not properly followed, could cause problems in your machine's configuration or operating system.



Warning

The Warning icon alerts you to steps or procedures that could be hazardous to your health, cause permanent damage to the equipment, or impose unpredictable results on the surrounding environment.

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Text Conventions

The following conventions are used in this manual. Computer-generated text is shown in typewriter font. Examples of computer-generated text are: program output (such as the screen display during the software installation procedure), commands, directory names, file names, variables, prompts, and sections of program code.

```
Computer-generated text example
```

Commands to be entered by the user are printed in **bold Courier** type. For example:

```
cd /usr/tmp
```

Pressing the return key (↵ **Return**) at the end of the command line entry is assumed, when not explicitly shown. For example:

```
/bin/su
```

is the same as:

```
/bin/su ↵ Return
```

Required user input, when mixed with program output, is printed in **bold Courier** type. References to UNIX programs and manual page entries follow the standard UNIX conventions.

When a user command, system prompt, or system response is too long to fit on a single line, it will be shown as

```
Do you want the new kernel moved into
\ vmunix?[y]
```

with a backslash at either the beginning of the continued line or at the end of the previous line.

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Introduction 1

Overview

The 6200 VME to PCI Interface adapter provides a bridge between a VME bus and a PCI bus. The 6200 adapter's VMEbus features are fully programmable from the VMEbus side. The 6200 supports read-modify-write cycles on the VMEbus. With its other VMEbus functions, the 6200 provides full VME interrupt and multilevel requester capabilities.

Product Features

- 6U or 9U compatibility. Because of its 6U form factor, this product can be integrated into 6U and, with an adapter, 9U VMEbus card cages.
- 2 PMC population sites, for either one or two daughtercards, thus allowing for 2 independent PMC adapters
- Fully compliant, 32-bit, 33 MHz PCI local bus interface
- Fully compliant 64-bit high performance VMEbus interface
- Integral FIFOs for write posting to maximize bandwidth utilization
- Programmable DMA controller with linked list support
- VMEbus transfer rates of 60-70 MBps
- Complete suite of VMEbus address and data transfer modes
  - A32/A24/A16 master and slave
  - D64 (MBLT)/D32/D16/D08 master and slave

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  - BLT, ADOH, RMW, LOCK
- Flexible register set, programmable from the VMEbus port
- Implements all of the addressing and data transfer modes documented in the VME64 specifications (except A64 and those intended to support 3U applications, that is, A40 and MD32)

Package Contents

The 6200 Software Developer's Kit (SDK) includes the following items:

- 6200 VME to PCI Interface adapter
- *6200 VME to PCI Interface AdapterInstallation Guide*
- Newbridge Microsystems' *Universe™ User Manual*
- Sample 6200 driver source code (available from an Interphase password-protected ftp site)

System Requirements

System requirements for the 6200 adapter are as follows:

- Approximately 200K free disk space for driver installation
- VME-based system

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Installing the 6200 Adapter

2

Overview

Installing the 6200 adapter involves 4 basic steps:

1. Inspect the board.
2. Set onboard jumpers.
3. Power off system.
4. Install the board.

Inspect the Board



Caution

Handle the 6200 adapter carefully; the card is sensitive to static electricity. Interphase ships the board in an anti-static bag. Do not touch the adapter's components or metal parts (hold the adapter by its edges). To prevent card damage from electrostatic discharge, wear a grounding strap.

Remove the 6200 from its anti-static bag, and visually inspect it to ensure that no damage has occurred during shipment. A visual inspection is usually sufficient, as Interphase thoroughly checks each board just prior to shipment.

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If the board is undamaged, proceed with the installation. If the board is damaged, refer to the Assistance information at the front of this manual. In addition to contacting your reseller or Interphase, contact the carrier (for example, UPS or Federal Express) that delivered the package.



Warning

Do not install, or apply power to, a damaged board. Failure to observe this warning could result in extensive damage to the board and/or the system.

Set Onboard Jumpers

Set the onboard jumpers so that the 6200 is properly configured for operation in your system. Figure 2-1 on page 5 shows the location of the jumpers. In this manual, IN refers to the jumper being installed across the pins indicated; OUT indicates the jumper is removed.

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Note: The boxed pins are pin position #1

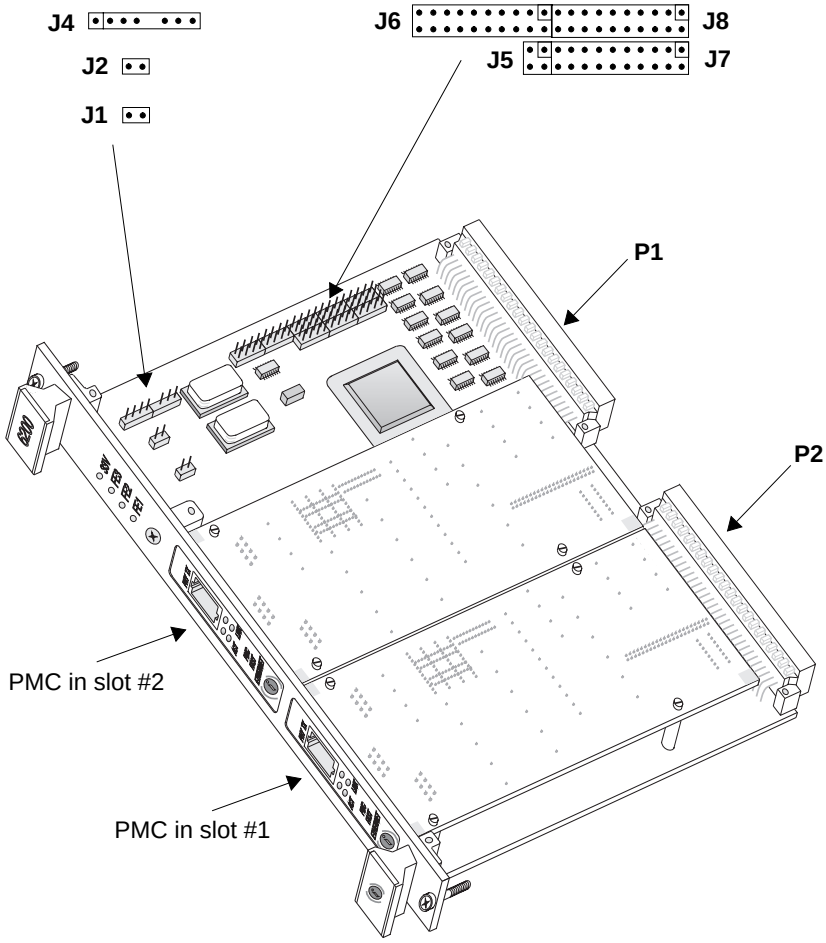


Figure 2-1. 6200 Motherboard Jumper Pins

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Jumper Blocks for Interphase Use Only

The following jumper blocks are for Interphase use only:

- J1, Board Reset Switch (for debugging only)
- J2, PCI Bus Reset Switch (for debugging only)
- J4, In-System Programming Header

Reserved Jumper Blocks and Pins

The following jumper blocks are reserved:

- J5
- J6

J7 pins 3 and 4 through 19 and 20 are reserved.



Note

In jumper blocks J5 through J8, pin 2 is directly underneath pin 1 (see Figure 2-1 on page 5).

Jumper Blocks J7 and J8

Use these jumper blocks to

- Choose VME address space
- Set base address space for VME bus register slave image

Required

J8 pins 1 and 2 must be IN to enable the slave register image. This is the default.

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VME Address Space

To choose VME address space:

To choose this VME address space . . .	J8 pins 3 and 4	J8 pins 5 and 6
A16	OUT	OUT
A24	OUT	IN
A32	IN	OUT

Base Address Space

Set the following jumpers to select the short I/O space the board will respond to according to the VME address space you chose:

These pins . . .	Represent this bit if you chose A16 . . .	Represent this bit if you chose A24 . . .	Represent this bit if you chose A32 . . .
J8 pins 7 and 8	A15	A23	A31
J8 pins 9 and 10	A14	A22	A30
J8 pins 11 and 12	A13	A21	A29
J8 pins 13 and 14	A12	A20	A28
J8 pins 15 and 16	n/a	A19	A27
J8 pins 17 and 18	n/a	A18	A26
J8 pins 19 and 20	n/a	A17	A25
J7 pins 1 and 2	n/a	A16	A24

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Note

If you choose A16, the system provides bits A11 through A8.

A16 Example

If you choose VME address space A16 and want the board to respond to the short I/O space 8000, you would set your block J7 and J8 jumpers as follows:

Pins	Setting
J8 pins 1 and 2	IN
J8 pins 3 and 4	OUT
J8 pins 5 and 6	OUT
J8 pins 7 and 8	IN
J8 pins 9 and 10	OUT
J8 pins 11 and 12	OUT
J8 pins 13 and 14	OUT
J8 pins 15 and 16	OUT
J8 pins 17 and 18	OUT
J8 pins 19 and 20	OUT
J7 pins 1 and 2	OUT
J7 pins 3 and 4 through 19 and 20	n/a (Reserved)

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A24 Example

If you choose VME address space A24 and want the board to respond to the short I/O space 800000, you would set your block J7 and J8 jumpers as follows:

Pins	Setting
J8 pins 1 and 2	IN
J8 pins 3 and 4	OUT
J8 pins 5 and 6	IN
J8 pins 7 and 8	IN
J8 pins 9 and 10	OUT
J8 pins 11 and 12	OUT
J8 pins 13 and 14	OUT
J8 pins 15 and 16	OUT
J8 pins 17 and 18	OUT
J8 pins 19 and 20	OUT
J7 pins 1 and 2	OUT
J7 pins 3 and 4 through 19 and 20	n/a (Reserved)

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A32 Example

If you choose VME address space A32 and want the board to respond to the short I/O space 80000000, you would set your block J7 and J8 jumpers as follows:

Pins	Setting
J8 pins 1 and 2	IN
J8 pins 3 and 4	IN
J8 pins 5 and 6	OUT
J8 pins 7 and 8	IN
J8 pins 9 and 10	OUT
J8 pins 11 and 12	OUT
J8 pins 13 and 14	OUT
J8 pins 15 and 16	OUT
J8 pins 17 and 18	OUT
J8 pins 19 and 20	OUT
J7 pins 1 and 2	OUT
J7 pins 3 and 4 through 19 and 20	n/a (Reserved)

Power Off System

Once the board is configured, ensure that the host system and peripherals are turned off.

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Caution

System power and peripheral power must be turned off before attempting to install the 6200. Failure to do so can result in severe damage to the board and/or the system.

Install the Board

Install the 6200 adapter as follows:

1. Carefully slide the 6200 into the VMEbus card slot. It should slide all the way in without any difficulty.
2. Once the board is properly seated in the slot, tighten the captive mounting screws on each end of the front panel.

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6200 Specifications

A

Architecture

PCI-VME Bridge	Tundra® Semiconductor's Universe™
Local Buffer	512 KBytes

VMEBus Specifications

Capable data transfers	D32 BLT 30 MBps D64 MBLT 60 MBps
Address and data transfer modes	A32/A24/A16 D64/D32/D16/D08 BLT (Block Transfer) ADOH (Address-Only-With-Handshake) RMW (Read-Modify-Write) LOCK
Short I/O address	Jumper selectable

PCI Local Bus Specifications

- 33 MHz, 32-bit PCI local bus interface
- 2 sets of PMC connectors
- 5V only

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Mechanical (Nominal)

The 6200 occupies one 6U single-height VMEbus slot.

Width	9.20" (233 mm)
Height	6.30" (160 mm)
Thickness	20 mm
Weight	214 g (no daughtercards)

Power Requirements

6200 motherboard	1.1A at +5VDC

Operating Environment

Temperature	0–55° C / 32–131° F
Relative humidity	10–95% noncondensing
Altitude	-1000–15,000 feet
Air flow	250 LFM minimum

Storage Environment

This section assumes the adapter is stored in its original anti-static bag and box.

Temperature	-40–85° C / -42–185° F
Relative humidity	10–95% noncondensing
Altitude	-1000 to 50,000 feet

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VME Technology Overview

B

VME Technology

VMEbus features a 32-bit address bus (up to 4 gigabytes of memory) and a 32-bit data bus, both of which can be dynamically configured. VMEbus also performs multiprocessing and can smoothly handle seven interrupt levels. VMEbus handles data transfers at speeds in excess of 40 MBps.

VMEbus uses a master-slave architecture. Masters transfer data to and from modules called slaves. Before a master can transfer data it must first acquire the bus using a central arbiter. This arbiter is part of the system controller. Its function is to determine which master accesses the bus next.

All bus activity is performed by the following four sub-busses:

- Data Transfer Bus
- Data Transfer Arbitration Bus
- Priority Interrupt Bus (interrupt processing)
- Utility Bus (16 Mhz clock and power-up reset)

For more information about VME terminology, see the glossary.

Obtaining VME Specifications

- VME64 Specification, available from:

  VME International Trade Association
  10229 North Scottsdale Road, Suite B
  Scottsdale, AZ 85253

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- VMEbus Specification Revision D, IEEE, available from:

  IEEE Service Center
  Publications Sales Department
  445 Hoes Lane
  Piscataway, NJ 08854-4150

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PCI/PMC Technology Overview

C

PCI/PMC Technology

A PCI bridge provides a high bandwidth path allowing PCI masters direct access to main memory. Intel® Corporation and the PCI SIG designed the PCI bus as the next generation I/O expansion bus. Its predecessors were ISA, EISA, and MCA. The PCI bus is a high-performance bus found in systems ranging from low-end PCs to high-end servers.

Three sizes of PCI add-in boards are defined: long, short, and variable short length. Systems are not required to support all board types. To accommodate the 5V and 3.3V signaling environments and to facilitate a smooth migration path between the voltages, three add-in board electrical types are specified: a “5 volt” board which plugs into only 5V connectors, a “universal” board which plugs into both 5V and 3.3V connectors, and a “3.3 volt” board which plugs into only 3.3V connectors.

The PMC bus was designed for embedded environments. It implements PCI bus logic in a daughtercard (mezzanine) form factor.

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State _____ Zip _____ Country _____

Province _____

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Fax ( ) _____

E-mail Address _____

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Serial Number _____

Where did you purchase this product (company name)? _____

Date Purchased _____

Number of client nodes at this site: _____

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❑ HP-UX ❑ IRIX ❑ Mac OS ❑ Windows NT

❑ PC NFS ❑ DEC Ultrix ❑ Other _____

Operating System Version: _____

Network Protocol(s) in use:

❑ TCP/IP ❑ IPX ❑ AppleTalk ❑ Other _____

We welcome your comments, ideas, and suggestions. Attach additional sheets if necessary.

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