



Software Product Description

PRODUCT NAME: DIGITAL PCI32-VME64 Adapter Driver, DIGITAL UNIX,
Version 1.0

SPD 60.79.00

DESCRIPTION

The DIGITAL PCI32-VME64 Adapter Driver, DIGITAL UNIX®, is sold as a part of the DIGITAL PCI32-VME64 Adapter for DIGITAL UNIX (DIGITAL part number 2T-DWP64-BA which includes the adapter hardware).

The PCI32-VME64 Adapter Driver for DIGITAL UNIX provides a flexible interface to the VMEbus. It includes software which enables access to a wide variety of VME input/output devices through user supplied device drivers.

The PCI32-VME64 Adapter for DIGITAL UNIX was developed as an option for high-end servers running DIGITAL UNIX that have a PCI I/O bus. The DIGITAL UNIX Operating System does not include support for the PCI32-VME64 Adapter. The PCI32-VME64 Adapter Driver for DIGITAL UNIX provides the operating system extensions required for DIGITAL UNIX to support the PCI32-VME64 Adapter.

In addition to the PCI32-VME64 Adapter Driver software, the 2T-DWP64-BA includes a set of two option modules and an interconnecting 3-meter I/O cable. The PCI module occupies one long card slot on the PCI Local Bus. The VME module occupies one slot of size '6U' on a VMEbus. The 2T-DWP64-BA thus provides a PCI to VME bridge. The PCI32-VME64 Adapter Driver supports this bridge and is a prerequisite for support of devices residing on the VMEbus so that they can communicate with the Alpha system.

The PCI32-VME64 Adapter Driver software does NOT provide UNIX device drivers for VME devices. Appropriate DIGITAL UNIX device drivers are required for each of the VME options installed on the VMEbus. VME device drivers use the PCI32-VME64 Adapter Driver to

gain access to the device(s) on the VMEbus. The VME device drivers must be written or purchased by the customer.

Compaq offers a custom service for writing VME device drivers. For additional information call 1-800-344-4285 or send mail to cs_realtime@digital.com.

Memory mapped I/O via the PCI32-VME64 Adapter is supported subject to the technical limitations and restrictions per the DIGITAL UNIX Operating System (SPD 41.61.nn) and the latest technical documentation for the 2T-DWP64-BA. Refer to the DIGITAL UNIX Operating System Software Product Description for complete details on memory mapped I/O support.

Controller mode Direct Memory Access (DMA), slave mode DMA, and Programmed I/O are supported. Controller mode DMA is initiated by the Alpha host system and uses the DMA engine on the VME card of the PCI32-VME64 adapter. Slave mode DMA is initiated by another device on the VMEbus and uses that device's DMA engine.

CONFORMANCE TO STANDARDS

The PCI32-VME64 Adapter conforms to the following ANSI/IEEE Standards:

- 1014C IEEE Standard for a Versatile Backplane Bus: VMEbus,
- PCI Local Bus Specification Version 2.0.

HARDWARE REQUIREMENTS

Processors Supported

AlphaServer 4100 5/xxx

AlphaServer 8200 5/xxx
AlphaServer 8400 5/xxx

Processors Not Currently Supported

DEC 3000 Model Systems, DEC 4000 Model Systems
DEC 7000 Model Systems, DEC 10000 Model Systems

AlphaStation Systems

DIGITAL Personal Worksta-
tions

DIGITAL DMCC Systems

AlphaServer 300 Systems, AlphaServer 800 Systems
AlphaServer 1200 Systems

AlphaServer 1000 Systems, AlphaServer 1000A Systems

AlphaServer 2000 Systems

AlphaServer 2100 Systems, AlphaServer 2100A Systems

VAX and other RISC based processors are not sup-
ported.

For information on support of other AlphaServer mod-
els, or to inquire about adding support for any Al-
pha system, call 1-800-344-4285 or send mail to
cs_realtime@digital.com.

Other Hardware Required:

The following hardware is required:

2T-DWP64-BA PCI32-VME64 Adapter

PCI32-VME64 Adapter Restrictions:

A design goal of the PCI32-VME64 adapter was to re-
duce VME initiated interrupt processing latency by the
Alpha host. This optimization allows VME initiated in-
terrupts to take a special path through the PCI32-VME64
bus adapter. During a slave mode DMA write, a de-
vice on the VMEbus uses its DMA engine to write data
to the PCI32-VME64 bus adapter which then transfers
the data to Alpha host memory. After all the data have
been read by the PCI32-VME64 adapter, the slave de-
vice usually generates a VME interrupt to signal DMA
completion. This interrupt, under certain situations, can
arrive at the Alpha CPU prior to all DMA data reaching
Alpha host memory. If the application assumes that de-
livery of the interrupt indicates that all data is in Alpha
memory, a data integrity problem may exist.

Note: This can NOT occur with Controller mode DMA
or when slave mode DMA is reading Alpha host memory.

For most applications which include VME Master write
DMA operations, simply reading the DMA data starting
at the beginning of the memory buffer will allow suffi-
cient time for the data transfer to complete. However,
depending upon the size of the data transfer and other
specifics of the application, some other method of syn-
chronization may be required.

The following restrictions also apply to the PCI32-
VME64 adapter hardware and the DIGITAL UNIX
PCI32-VME64 adapter software:

- Installation of the PCI module in a PCI slot which
supports shared interrupts is not supported
- Installation of the PCI module in a PCI slot which
is behind a PCI-PCI bridge chip (ie. secondary PCI
bus) is not supported.
- The maximum number of PCI32-VME64 adapters on
a single PCI bus or PCI bus segment is 3.

Note: On some systems, such as the AlphaServer
8200 and AlphaServer 8400, the PCI bus is divided
into multiple PCI bus segments. The hardware docu-
mentation which came with your system explains its
PCI bus implementation.

- A maximum of twelve (12) PCI32-VME64 adapters
may be installed in a system running DIGITAL UNIX.
- Multiple PCI32-VME64 adapters must not be placed
in parallel. This means that PCI adapter cards in-
stalled on the same PCI bus or PCI bus segment
must be connected to VME adapter cards on differ-
ent VME buses. VME adapter cards on the same
VME bus must be connected to PCI adapter cards
on different PCI buses or PCI bus segments.
- The PCI32-VME64 adapter is configured in the PCI
Sparse Memory Space addressing window. Each
PCI to VME adapter can be configured to use 16, 32,
or 64 Mbytes of PCI Sparse Memory Space. Graph-
ics cards and other PCI devices also consume PCI
Sparse Memory Space. For some configurations,
there may be insufficient PCI Sparse Memory Space
for the PCI32-VME64 adapter to be configured.
- Due to the tightly integrated nature of the module set,
power to the VME module must remain on while the
DIGITAL UNIX operating system is running. Power-
ing off the VMEbus chassis while the DIGITAL UNIX
operating system is running **will** result in a system
crash or hang.

For additional information on the functional capabilities
of the PCI32-VME Adapter call 1-800-344-4285 or send
mail to cs_realtime@digital.com.

Disk Space Requirements

Disk space required for installation: 1 MB

Disk space required for use (permanent): 1 MB

These counts refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options.

SOFTWARE REQUIREMENTS

- DIGITAL UNIX Operating System V4.0D

GROWTH CONSIDERATIONS

The minimum hardware/software requirements for any future version of this product may be different from the requirements for the current version.

DISTRIBUTION MEDIA

CD-ROM

ORDERING INFORMATION

The DIGITAL PCI32-VME64 Adapter Driver, DIGITAL UNIX, is bundled with the PCI32-VME64 adapter hardware under the 2T-DWP64-BA part number. 2T-DWP64-BA includes:

- PCI Bus Bridge Module
- VMEbus Bridge Module
- Interconnect Cable
- CD-ROM containing DIGITAL PCI32-VME64 Adapter Driver, DIGITAL UNIX, software
- DIGITAL PCI32-VME64 Adapter Hardware Owner's Guide
- DIGITAL PCI32-VME64 Adapter Driver, DIGITAL UNIX, Installation Guide
- DIGITAL PCI32-VME64 Adapter Driver, DIGITAL UNIX, User's Guide
- License for the DIGITAL PCI32-VME64 Adapter Driver, DIGITAL UNIX

SOFTWARE LICENSING

This software is relicensable in conjunction with the DIGITAL PCI32-VME64 Adapter hardware.

This software is furnished only under a license. For more information about Compaq licensing terms and policies, contact your local Compaq office.

SOFTWARE PRODUCT SERVICES

A variety of service options are available from Compaq. For more information, contact your local Compaq office.

For information on VMEbus device driver development services, call 1-800-344-4825, or send mail to cs_realtime@digital.com.

SOFTWARE WARRANTY

Warranty for this software product is provided by Compaq with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

The above information is valid at time of release. Please contact your local Compaq office for the most up-to-date information.

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