digital™

Software Product Description

PRODUCT NAME: IEX-VMS-DRIVER, Version 4.5 **SPD 26.30.11**

DESCRIPTION

The DIGITAL IEX-VMS-DRIVER allows programs written in VAX MACRO and higher-level languages (such as VAX FORTRAN, VAX BASIC, and VAX Pascal) to communicate through the IEU11-A or IEQ11-A with devices containing an IEC 625-1 or IEEE-488 Standard interface. This communication is implemented through a choice of direct QIO calls or a set of subroutines callable from high-level languages.

Note: In the following description, the term IEX11 stands for the IEU11-A and/or IEQ11-A interface. The IEU11-A supports VAX UNIBUS machines, and the IEQ11-A supports MicroVAX Q–bus machines.

The IEX11-A interface is a bit-parallel, byte-serial device that can perform transfers in either program interrupt or DMA (direct memory access) mode. Program interrupt is used for transferring commands and addresses, while DMA is used for transferring data. DMA significantly reduces processor loading during the transfer of long data buffers.

The IEX11-A interface contains two independent IEC /IEEE bus controllers, also known as General Purpose Interface Buses (GPIBs). These two controllers may be connected to the same or to different IEC/IEEE buses. Up to 15 devices may be attached to each IEC/IEEE bus. Each IEX11-A IEC/IEEE bus controller counts as a device on its IEC/IEEE bus.

The IEX11 is most commonly used as Controller-in-Charge, but it can also be used when another device is Controller-in-Charge. The Controller-in-Charge directs the sequence of information on the bus.

When the IEX11 acts as Controller-in-Charge, it may request status information from other devices through serial and parallel polling. When the IEX11 is not Controller-in-Charge, it can be polled in either fashion to provide status information.

Features

The DIGITAL IEX-VMS-DRIVER supports the following IEC/IEEE hardware capabilities:

- Controller (C1, C2, C3, C4, C5)
- Talker and Extended Talker (T5, TE5)
- Listener and Extended Listener (L3, LE3)
- Automatic Source Handshake (SH1)
- Automatic Acceptor Handshake (AH1)
- Service Request (SR1)
- Remote/Local (RL1)
- Parallel Poll (PP1, PP2)
- Device Clear (DC1)
- Device Trigger (DT1)

The DIGITAL IEX-VMS-DRIVER supports QIO requests to perform the following software functions:

- Initialize Unit
- Write Data
- Read Data
- Send One IEC/IEEE Bus Command*
- Send a String of IEC/IEEE Bus Commands*
- Request Service**
- Issue a Serial Poll*
- Configure Devices for Parallel Polls*

August 1998
AE-BW75N-TE

- Load Parallel Poll Register**
- Perform a Parallel Poll*
- Go to Controller-Active-State (CACS)*
- Go to Controller-Standby-State (CSBS)*
- Pass Control*
- Sense Mode
- Set Mode
- Enable Event Recognition
- Recognize Events

The event recognition facility allows the user's process to specify the events on the IEC/IEEE instrument bus which the interface should detect. The interface is capable of detecting the occurrence of the following events:

- Service Request*
- Addressed as Listener**
- Addressed as Talker**
- Deaddressed**
- Addressed as Extended Listener**
- Addressed as Extended Talker**
- Device Clear**
- Device Trigger**
- Remote/Local Change**
- Parallel Poll Configure**
- Parallel Poll Unconfigure**
- Interface Clear

* Functions that can only be used by the Controller-in-Charge

** Functions used only by a device that is not Controller-in-Charge

All IEC/IEEE bus commands are issued through a process request and all data is transferred through the DMA mechanism. When the DIGIAL IEX-VMS-DRIVER is processing a read data request, the three ways to detect the end of the data transfer are:

- Byte Count Overflow — Transfer terminates after the specified number of bytes have been read.
- EOI Termination — Transfer terminates if, during the reception of a byte, the EOI line is true.
- Match Character — Transfer terminates after the Termination specified match character has been consecutively received the specified number of times.

A device exerciser is provided to verify that the DIGITAL IEX-VMS-DRIVER is correctly installed and to aid the user in testing his application. When the two bus controllers are connected with a loop back cable (refer to the *IEU11-A/IEQ11-A User's Guide*), the device exerciser can be run with command files delivered with the exerciser. These command files demonstrate all features of the driver and the IEC/IEEE bus interface functions. The device exerciser can also be used by users in a dialogue mode to test their devices. The commands to the exerciser are directly converted into QIOs to the driver. Using the exerciser in the dialogue mode, users can quickly determine the set of QIOs required for their application.

The DIGITAL IEX-VMS-DRIVER may be programmed in the following two ways:

OpenVMS QIO System Service — The OpenVMS QIO requests allow direct access to the driver. These requests can be issued in higher-level languages (such as VAX FORTRAN, VAX BASIC, VAX Pascal, and MACRO-32). This is the most flexible way of programming the IEX11 device, but requires the user to be familiar with the QIO calling procedures.

Simplified User Interface — This is a package of subroutines which can be called from higher-level languages (such as VAX FORTRAN and VAX BASIC) to perform the following functions:

IESTRT	-	Initialize an interface
IEPOLL	-	Setup for serial polling
IESEND	-	Send data
IERECV	-	Receive data
IERQSV	-	Request service
IECMD	-	Perform a bus control function
IEWFE	-	Wait for IEC/IEEE bus event

HARDWARE REQUIREMENTS

Processors Supported

VAX: VAX 4000 Model 100,
VAX 4000 Model 100A,
VAX 4000 Model 200,
VAX 4000 Model 300,
VAX 4000 Model 400,
VAX 4000 Model 500,
VAX 4000 Model 600,
VAX 4000 Model 500A,
VAX 4000 Model 600A,
VAX 4000 Model 700A

VAX 8200, VAX 8250, VAX 8300,
VAX 8350, VAX 8600, VAX 8650

VAX–11/730, VAX–11/750,
VAX–11/780, VAX–11/785

MicroVAX: MicroVAX II,
MicroVAX 3300, MicroVAX 3400,
MicroVAX 3500, MicroVAX 3600,
MicroVAX 3800, MicroVAX 3900

VAXstation: VAXstation II,
VAXstation 3200, VAXstation 3500,

Processors Not Supported

VAX: VAX 6000 Model 200 Series,
VAX 6000 Model 300 Series,
VAX 6000 Model 400 Series,
VAX 6000 Model 500 Series,
VAX 6000 Model 600 Series

VAX 8500, VAX 8530, VAX 8550,
VAX 8700, VAX 8800, VAX 8810,
VAX 8820, VAX 8830, VAX 8840

VAX 9000 Model 110,
VAX 9000 Model 210,
VAX 9000 Model 300 Series,
VAX 9000 Model 400 Series

VAXft Model 110,
VAXft Model 310,
VAXft Model 410,
VAXft Model 610,
VAXft Model 612

VAX–11/725, VAX–11/782

MicroVAX: MicroVAX I, MicroVAX 2000,
MicroVAX 3100 Model 10/10E,
MicroVAX 3100 Model 20/20E,
MicroVAX 3100 Model 30,
MicroVAX 3100 Model 40,
MicroVAX 3100 Model 80

VAXstation: VAXstation I, VAXstation 2000,
VAXstation 3100 Model 30,
VAXstation 3100 Model 38,
VAXstation 3100 Model 40,
VAXstation 3100 Model 48,
VAXstation 3100 Model 76,
VAXstation 3520, VAXstation 3540,
VAXstation 8000

VAXstation 4000 Model 60,
VAXstation 4000 VLC

VAXserver: VAXserver 3100, VAXserver 3300,
VAXserver 3400, VAXserver 3500,
VAXserver 3600, VAXserver 3602,
VAXserver 3800, VAXserver 3900

VAXserver 4000 Model 200,
VAXserver 4000 Model 300,
VAXserver 4000 Model 500

VAXserver 6000 Model 210,
VAXserver 6000 Model 220,
VAXserver 6000 Model 310,
VAXserver 6000 Model 320,
VAXserver 6000 Model 410,
VAXserver 6000 Model 420,
VAXserver 6000 Model 510,
VAXserver 6000 Model 520,
VAXserver 6000 Model 610,
VAXserver 6000 Model 620,
VAXserver 6000 Model 630

Processor Restrictions

- A minimum of an R80/RL02 configuration is required for VAX–11/730 systems.
- For VAX–11/730 systems, the IEU11-A must be mounted in an expansion cabinet due to cabling constraints, unless a System Building Block configuration is used.
- Minimum hardware revision for support on 8200, 8250, 8300, 8350 BI series CPUs is IEU11 Revision E and DWBUA Revision F.
- For VAX 4000 systems, a maximum of 1 IEQ11 module is supported per system configuration.

Other Hardware Required

- At least 6 Kbytes nonpaged pool memory for the driver
- At least one IEU11-A for UNIBUS based VAX systems
- At least one IEQ11-A for Q–bus based VAX systems

Disk Space Requirements

Disk space required for installation:	1,300 blocks (.7 Mbytes)
Disk space required for use (permanent):	1,000 blocks (.5 Mbytes)

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.

OPTIONAL HARDWARE

Depending on processor type, up to 3 additional IEU11 /IEQ11 modules may be added to each system for a total of 4 maximum.

CLUSTER ENVIRONMENT

This layered product is fully supported when installed on any valid and licensed VAXcluster configuration. It must be installed once on each VAX, MicroVAX, or VAXstation processor on which usage is planned.

In order to configure some product-specific attributes that must remain unique to each system, certain components of the product are stored in the system-specific environment (SYS$SPECIFIC:[SYSxxx]) of the VAX, MicroVAX, or VAXstation processor on which the installation is performed. The remaining components of the product, including some or all of the executable images, will be installed common to all accessing systems.

SOFTWARE REQUIREMENTS

OpenVMS Operating System V6.2 or

OpenVMS Operating System V7.1

OpenVMS Tailoring

The following OpenVMS classes are required for full functionality of this layered product:

- OpenVMS Required Saveset
- Programming Support
- System Programming Support
- User Environment Test Package

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

TK50 Streaming Tape

This product is also available as part of the OpenVMS Consolidated Software Distribution on CDROM.

ORDERING INFORMATION

Software Licenses: QL-519A9-**
Software Media: QA-519A*-**
Software Documentation: QA-519AA-GZ

* Denotes variant fields. For additional information on available licenses, services, and media, refer to the appropriate price book.

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

SOFTWARE LICENSING

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

License Management Facility Support

This layered product supports the OpenVMS License Management Facility.

License units for this product are allocated on an Unlimited System Use basis.

For more information on the License Management Facility, refer to the OpenVMS Operating System Software Product Description (SPD 25.01.xx) or the OpenVMS Operating System documentation set.

SOFTWARE PRODUCT SERVICES

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

® IEEE-488 is a registered trademark of The Institute of Electrical and Electronics Engineers, Inc.

™ The DIGITAL Logo, BI, CI, DEC, DIGITAL, MicroVAX, OpenVMS, Q–bus, RL, TK, UNIBUS, VAX, VAX BASIC, VAX FORTRAN, VAX MACRO, VAX Pascal, VAXcluster, VAXft, VAXserver, VAXstation, and VMS are trademarks of Digital Equipment Corporation.

Printed in U.S.A. © 1998 Digital Equipment Corporation. All rights reserved.