Software Product Description

PRODUCT NAME: KMV1A MicroVAX Driver and X.25 Link Level Software, Version 2.3 **SPD 28.27.04**

DESCRIPTION

The KMV1A MicroVAX Driver and X.25 Link Level Software product consists of two major components: a driver to control communications between a MicroVAX host and a KMV1A Programmable Communications Controller, and KMV1A microcode and host-based software which allow the KMV1A Controller to either process the data link level of the X.25 communications protocol or to perform HDLC framing. These major components are described below.

Driver

The driver provides a mechanism for communications between a MicroVAX host and the KMV1A Programmable Communications Controller. The driver controls this communication by providing an interface between MicroVAX application programs and microcode being executed in the KMV1A Controller's microprocessor. The communication includes data transfer; and the transfer of command, control, and status information to and from the KMV1A Controller. The driver also provides the mechanism to load microcode from the MicroVAX host into the KMV1A Controller, and to initialize the microcode.

Note: The driver consists of three major components: the KMV1A driver, the installation verification program, and a demonstration program. The features of each of these components are described below in the Features section.

X.25 Link Level Software

The X.25 link level component of the software product provides an X.25-based communications capability. The X.25 link level component includes microcode which is downline loaded into the memory of the KMV1A Controller. The microcode is executed by the KMV1A Controller's microprocessor to control and process data transmission between the driver and the KMV1A Controller's communications line. The microcode can be configured at the user's option to either execute the data link level of the X.25 communications protocol or to provide an HDLC framing capability only.

The link level option provided by the microcode performs processing of the data link level of the X.25 protocol in conformance with the 1980 CCITT X.25 Recommendation pertaining to Link Access Procedure (LAPB). The functions provided through the link level processing include data framing, frame header generation, error checking, and retransmission of erroneous frames.

The HDLC framing option provides a subset of the link level processing capability. The framing is done in conformance with the ISO 3309 Standard for HDLC frame generation and recognition.

In addition to the KMV1A microcode, the X.25 link level component of the product also includes a sample host program, tracing utility, and installation verification program. These components facilitate the installation and testing of the X.25 product component. They also facilitate the customer development and testing of MicroVAX host applications which communicate with the KMV1A Controller and X.25 microcode to form a complete communications application.

Features

Driver

The driver provides the following features:

- Loading of microcode into the KMV1A Controller
- Initialization of KMV1A microcode
- Capability to upline dump the memory contents of the KMV1A Controller RAM to host memory
- QIO based interface for communications between the MicroVAX host and KMV1A Controller
- Memory mapped control of host area for DMA data transfer to and from the KMV1A Controller
- Host error logging of detected KMV1A errors

Driver Demonstration Program

The driver host demonstration program is a compilable FORTRAN program which provides an example of basic commands used by MicroVAX application programs to interface to the KMV1A Controller through the KMV1A driver. The demonstration program loads and initializes test KMV1A microcode, and then performs several transmit and receive commands.

The driver demonstration program is included in this software product for instructional purposes only; it is meant to serve as an example of effective use of the KMV1A driver. Digital does not provide the demonstration program for use, as is, by customers in functional host communications applications. Digital will not support such use of the demonstration program.

Driver Installation Verification Program

The installation verification program associated with the driver verifies that the driver has been installed properly. The procedure performs basic driver functions and verifies that files are resident in the correct locations. The installation verification program also verifies that the KMV1A Controller is functioning at a basic level by transmitting data to and from the KMV1A Controller.

X.25 Link Level Software

Microcode Features

The microcode included in the X.25 link level component of the software product is downline loaded into the memory of the KMV1A Controller by the driver. When executed by the controller's microprocessor, the microcode provides three major functions: communications with the host via the driver, an option to execute the data link level of the X.25 protocol or to perform HDLC framing, and communications with the KMV1A Controller's communications line.

The microcode provides an interface to the driver to control communications between the KMV1A Controller and the host. This interface permits the exchange of control and status information between the host and controller. The microcode and driver also control DMA data transfers between controller memory and host memory.

The X.25 link level protocol processing option is executed in conformance with the 1980 CCITT X.25 Recommendation pertaining to Link Access Procedure (LAPB). The protocol processing functions performed through the link level option include data framing, frame header generation, error checking, and retransmission of erroneous or unacknowledged frames. The KMV1A X.25 microcode supports the user selection of the following system parameters defined by the 1980 CCITT Recommendation for the Link Access Procedure:

- N1B - The maximum number of eight-bit bytes in an information frame may be set to 16, 32, 64, 128, 256, or 512 bytes
- K - The maximum number of outstanding information frames may be set to an integer value between 1 and 7, inclusive
- T1 - The period of time after which retransmission of a frame is initiated may be set between 50 and 32767 milliseconds, inclusive
- N2 - The maximum number of retransmissions of an information frame before the link is reset and an error status is returned to the driver may be set at an integer value between 1 and 100, inclusive

The HDLC framing option provides a subset of the protocol processing functions performed by the link level option. The framing option performs frame generation and recognition only, in conformance with the ISO 3309 Standard pertaining to HDLC frame structure. The maximum number of eight-bit bytes per information frame is user-selectable up to a maximum of 512 bytes with the HDLC framing option.

The KMV1A microcode provides an interface to the KMV1A Controller's communications line. The following line control features are provided:

- Selection of internal clock with one of the following line speeds:
  - — 1.2 thousand bits per second (Kbps)
  - — 2.4 Kbps
  - — 4.8 Kbps
  - — 9.6 Kbps
  - — 19.2 Kbps
- Option to select full modem control (no ring indicator)
- Selection of internal loopback for testing and diagnostic purposes

Tracing Utility

The tracing utility allows the user to record and display historical information on data frames transmitted over KMV1A communications line(s). The user has the option of performing a trace on any of the up to eight KMV1A communications lines under the control of the X.25 link level microcode. The tracing utility may only be enabled when the microcode is configured for X.25 link level processing.

When selected, the tracing utility creates a disk file containing header information from all transmitted and received frames. The tracing utility also provides a mechanism to format the trace information for display on a host terminal.

Sample Host X.25 Program

A MicroVAX host application must be developed by the customer to communicate with the KMV1A Controller and form a complete communications application. The X.25 link level component of the product includes a sample host program which illustrates an effective host application interface to the KMV1A microcode through the KMV1A MicroVAX Driver. The sample program is provided in source form in the C language. The program provides an example of loading and initializing the KMV1A microcode, and performs several data transmits and receives through the driver.

The sample program is included in this software product for instructional purposes only; it is intended to provide a model for the user's development of host-based software. The sample program is not provided by Digital to be included, as is, in user-developed application software. Digital will not support the use of the sample program, or any part of the sample program, as part of a customer's application.

Installation Verification Program

The installation verification program is automatically invoked during kit installation. The program verifies that the X.25 link level component of the product has been correctly installed.

Performance

The KMV1A MicroVAX Driver and X.25 Link Level Software product Driver will support up to eight KMV1A Controllers per MicroVAX II/MicroVAX host. Each KMV1A Controller supports one communications line. The software product will perform full duplex data transmission at a maximum of 19.2 Kbps simultaneously on each of up to eight KMV1A communications lines. Achievement of this performance is subject to constraints applied by the total system loading of the MicroVAX II/MicroVAX host.

When the tracing utility is enabled, maximum KMV1A communications performance cannot be achieved. When the tracing utility is selected on one or two communications lines, full duplex data transmission at a maximum of 19.2 Kbps can be achievable simultaneously on each line. When tracing is enabled on more than two lines, performance may be lower.

HARDWARE REQUIREMENTS

Processor and/or configurations as specified in the System Support Addendum (SSA 28.27.04-x).

SOFTWARE REQUIREMENTS

For Systems Using Terminals (No DECwindows Interface):

OpenVMS Operating System

KMV1A MicroVAX Driver

Refer to the System Support Addendum for availability and required versions of prerequisite/optional software (SSA 28.27.04-x).

ORDERING INFORMATION

Software Licenses: QL-VCQA*-**

Software Media: QA-VCQA*-**

Software Documentation: QA-VCQA*-GZ

Software Product Services: QT-VCQA*-**

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

SOFTWARE LICENSING

This software is furnished under the licensing provisions of Digital Equipment Corporation's Standard Terms and Conditions. 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 a CPU-capacity 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.

For more information about Digital's licensing terms and policies, contact your local Digital office.

SOFTWARE PRODUCT SERVICES

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

SOFTWARE WARRANTY

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

System Support Addendum

PRODUCT NAME: KMV1A MicroVAX Driver and X.25 Link Level Software, Version 2.3

SSA 28.27.04-A

HARDWARE REQUIREMENTS

Processors Supported

VAX:
VAX 4000 Model 200,
VAX 4000 Model 300,
VAX 4000 Model 400,
VAX 4000 Model 500,
VAX 4000 Model 600,

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

VAXstation:
VAXstation II

Processors Not Supported

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

VAX 4000 Model 100

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 7000 Model 600 Series

VAX 8200, VAX 8250, VAX 8300,
VAX 8350, VAX 8500, VAX 8530,
VAX 8550, VAX 8600, VAX 8650,
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

VAX–11/725, VAX–11/730, VAX–11/750,
VAX–11/780, VAX–11/782, VAX–11/785

MicroVAX:
MicroVAX I, MicroVAX 2000
MicroVAX 3100 Model 10/10E , 20/20E,
Model 30/40, Model 80, Model 90

VAXstation:
VAXstation I, VAXstation 2000,
VAXstation 3100 Model 30/40, Model 38
/48, Model 76,
VAXstation 3200,VAXstation 3500, VAXsta-
tion 3520,
VAXstation 3540, VAXstation 4000 VLC,
VAXstation 4000 Model 60, VAXstation
4000 Model 90,
VAXstation 8000

VAXserver:
VAXserver 3100 Model 10/10E, 20/20E,
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 210/220, VAXserver
6000 Model 310/320,
VAXserver 6000 Model 410/420,VAXserver
6000 Model 510/520,
VAXserver 6000 Model 610, VAXserver
6000 Model 620,
VAXserver 6000 Model 630

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July 1993
AE-LW31E-TE

Other Hardware Required

The following information applies to MicroVAX II configurations. One KMV communications module is required:

KMV1A-M	KMV1A-M Module

One of the following cabinet kits must be ordered:

CK-KMV1A-AA	RS-232 for BA123 cabinet
CK-KMV1A-AB	RS-232 for BA23 cabinet
CK-KMV1A-AF	RS-232 for H9642 cabinet
CK-KMV1A-EA	RS-422 for BA123 cabinet
CK-KMV1A-EB	RS-422 for BA23 cabinet
CK-KMV1A-EF	RS-422 for H9642 cabinet
CK-KMV1A-FA	RS-423 for BA123 cabinet
CK-KMV1A-FB	RS-423 for BA23 cabinet
CK-KMV1A-FF	RS-423 for H9642 cabinet

The following information applies to MicroVAX supported configurations. One of the following KMV modules is required, but no cabinet kit is needed.

KMV1A-SA	RS-232 KMV module for BA213, factory integrated
KMV1A-SB	RS-422 KMV module for BA213, factory integrated
KMV1A-SC	RS-423 KMV module for BA213, factory integrated
KMV1A-SF	RS-232 KMV module for BA213, field installed
KMV1A-SG	RS-422 KMV module for BA213, field installed
KMV1A-SH	RS-423 KMV module for BA213, field installed

Disk Space Requirements (Block Cluster Size = 1)

Disk space required for installation:	1,050 blocks (537K bytes)
Disk space required for use (permanent):	700 blocks (358K bytes)

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

Up to seven additional KMV1A Programmable Communications Controllers may be added to the host system to form a maximum of eight KMV1A hardware units per system.

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 from which usage is planned.

In order to configure some products-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.

The *HARDWARE REQUIREMENTS* sections of this product's Software Product Description and System Support Addendum detail any special hardware required by this product.

* V5.x VAXcluster configurations are fully described in the VAXcluster Software Product Description (29.78.xx) and include CI, Ethernet, and Mixed Interconnect configurations.

SOFTWARE REQUIREMENTS

For Systems Using Terminals (No DECwindows Interface):

VMS Operating System V5.4 -OpenVMS V5.5 - V6.0
KMV1A MicroVAX Driver V2.6

OpenVMS Tailoring

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

- VMS Required Saveset
- Programming Support
- System Programming Support

For more information on OpenVMS classes and tailoring, refer to the OpenVMS Operating System Software Product Description (SPD 25.01.xx).

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

ORDERING INFORMATION

Software Licenses: QL-VCQA*-**
Software Media: QA-VCQA*-**
Software Documentation: QA-VCQAA-GZ
Software Product Services: QT-VCQA*-**

* 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. Contact your local Digital office for the most up-to-date information.