



Software Product Description

PRODUCT NAME: HP X.25 for OpenVMS Alpha and I64 Systems, V2.0
SPD 47.37.16

DESCRIPTION

HP *X.25 for OpenVMS* enables appropriately configured systems to connect to an X.25 Packet Switched Data Network (PSDN) via an X.25 Relay node on the same Local Area Network (LAN), via a DNA Phase IV X.25 connector node, or directly using a synchronous controller card for Alpha.

The product supports communication via PSDNs conforming to ITU/TSS recommendation X.25 1980, 1984, and 1988, or to international standard ISO 8208. Refer to the *SUPPORTED PUBLIC NETWORKS* section for the list of supported PSDNs.

HP X.25 V2.0 supports OpenVMS Operating System for Alpha version 8.2 and I64 version 8.2 and 8.2-1. X.25 V2.0 for OpenVMS Alpha contains synchronous device drivers and is required when using synchronous communications options.

Note: HP X.25 for OpenVMS I64 does not support synchronous device drivers and synchronous communications options.

HP *X.25 for OpenVMS* also provides the device drivers and specific data link protocol support for HP's synchronous communications options for OpenVMS Alpha systems.

HP *X.25 for OpenVMS* software allows the system to:

- Connect to other X.25 implementations using RFC 1613 (also known as XOT) via a TCP/IP wide area network.
- Act as a Gateway Access Protocol (GAP) server for Phase V GAP Clients

- Act as an X.25 Connector system for DECnet-Plus X.25 Access systems
- Act as a packet-mode DTE connected to a supported PSDN.
- Support ISO 8208 DTE to DTE point-to-point operation.
- Act as a packet-mode DTE connected to a LAN.
- Act as an X.25 Relay node conforming to ISO Technical Report 10029.
- Provide an X.25 sub-network for DECnet-Plus CONS and CLNS operation.
- Provide a DEC-HDLC point-to-point data link for DECnet-Plus CLNS operation.
- Act as a combination of the above, chosen on a per-DTE basis.

The following restrictions of HP *X.25 for OpenVMS* software should be noted:

- Phase IV GAP Clients (or access nodes) are not supported.
- P.S.I. Access (Phase IV) clients are not supported.
- DCE mode is supported for the purposes of point-to-point operation as described in ISO 8208; DCE mode for emulation of a PSDN is not supported.
- Use of the D bit in data packets is not supported.
- HP X.25 for OpenVMS I64 does not support synchronous device drivers and synchronous communications options. The LAPB configuration is not supported on I64.

HP *X.25 for OpenVMS* supports the following functions:

- Process-to-process (HP X.25) communication.
X.25 for OpenVMS allows application programs to access X.25 network services via the standard OpenVMS QIO system service.
- Process-to-terminal (X.29) communication.
Through the X.29 QIO programming interface, users of the OpenVMS system may make outgoing calls to other HP or non-HP systems or suitable network PADs accessible via a PSDN.
- Terminal-to-process (X.29) communication.
Remote terminals connected to the PSDN may access the OpenVMS host running X.25 by means of an X.29 Switched Virtual Circuit (SVC) call.
- DECnet-Plus Connectionless Network Service.
The product supports the use of the DEC-HDLC and X.25 protocols as sub-networks for the OSI Connectionless-mode Network Service (CLNS).
- DECnet-Plus Connection Oriented Network Service.
The product supports the OSI Connection Oriented Network Service (CONS) for OSI Transport over X.25 sub-networks.
- X.25 Mail.
The X.25 Mail utility allows communication across a PSDN via electronic mail between two systems running the Mail-11 protocol over X.25. Systems that support Mail-11 over X.25 include WAN Support for HP UNIX®, X.25 for OpenVMS and X.25 installations of DECnet-Plus for OpenVMS VAX.
- Wide Area Network (WAN) Device Drivers
The WAN device drivers support synchronous communications and offer a supported user (\$QIO) interface. This version also includes a pseudodriver (WANDRIVER) that provides a programming interface to the Data Link level for the LAPB, DEC-HDLC, and LLC2 protocols and an interface to the physical layer of the synchronous communication devices supported by the product.

Note: This function is not applicable for X.25 for OpenVMS I64.
- X.25 Relay allows an appropriately configured OpenVMS system to relay X.25 packets between a Local Area Network (LAN) and a synchronous communications link to a Packet Switched Data Network (PSDN).
- X.25 GAP Server allows remote Phase V GAP clients to connect to a PSDN via the GAP Server node using the DECnet NSP protocol. The remote X.25 client (or access node) communicates with the X.25 Server or X.25 Gateway/Connector node using the Gateway Access Protocol (GAP) via a DECnet session connection.

- The multi-host mode of operation provides the features offered by VAX P.S.I. Native and also allows VAX P.S.I. Access systems to connect to a PSDN as though directly connected.
- XOT or X.25 over TCP/IP allows X.25 applications on an appropriately configured OpenVMS System to communicate with other RFC 1613 implementations over a TCP/IP Wide Area Network.

Features

Conformance to Standards

HP *X.25 for OpenVMS* complies with the following standards:

- ITU/TSS recommendations—X.25 (1980, 1984, or 1988), X.3, X28, X.29
- International standards ISO—8208, 7776, 8881, 8802/2, 8878, 8473

Virtual Circuits

HP *X.25 for OpenVMS* offers communication over both Permanent Virtual Circuits (PVCs) and Switched Virtual Circuits (SVCs), and supports up to 4096 virtual circuits per system. One virtual circuit is used for each incoming or outgoing X.29 terminal connection, for each X.25 call, and for each DECnet-Plus routing circuit and transport connection. The use of PVCs for X.29 communication is not defined by the 1980 and 1984 ITU/TSS recommendations, and is not available with HP *X.25 for OpenVMS*.

Virtual circuits may use X.25 protocol over a LAN connection, over a WAN synchronous communications connection, or may use HP X.25 Client for OpenVMS Alpha Systems over a DECnet circuit to a DECnet Gateway Access Protocol (GAP) connector node. **NOTE** that there is no support for use of more than 512 of the available virtual circuits by HP X.25 Client for OpenVMS Alpha Systems with DECnet Gateway Access protocol connector nodes. See the HARDWARE REQUIREMENTS section for details of GAP connector nodes and ISO relay nodes supported.

Process-to-Process Communication

The HP *X.25 for OpenVMS* programming interface allows application programs to access X.25 packet level services via the standard OpenVMS QIO interface.

Functions include the establishment and clearing of network connections, data transmission and reception, sending and receiving of interrupt messages, and resetting of virtual circuits. The interface also provides for the segmentation and recombination of messages that are longer than the packet size selected for the circuit.

This interface enables an application program using OpenVMS System Services to communicate with complementary X.25 software on other HP or non-HP systems.

Terminal Communications

HP X.25 for OpenVMS supports terminal communications according to ITU/TSS recommendations X.3, X.28, and X.29. Only those terminal parameters defined in the X.3 recommendation are explicitly supported. Network-specific enhancements or extensions to the X.3 parameters are available at both the X.29 programming and the host-based PAD user interface. Terminal processes that depend on these extensions may not function correctly when used on other PSDNs or when accessing one PSDN via another (for example, international access).

The X.29 interactive terminal interface allows remote asynchronous terminals (character-mode DTEs) connected to the network to communicate with the OpenVMS system in a manner similar to local terminals. The maximum number of terminals supported on a OpenVMS Alpha system (both local and X.29 remote) cannot exceed the number for which the system has been configured.

When using applications designed for interactive, local terminal operations, transmission delays or PAD parameter settings can cause inconsistencies between incoming X.29 traffic and the application's operation. It may be necessary to make modifications to the application user interface or alter PAD parameter settings.

The X.29 interface includes a programming capability for the support of specific X.29 signaling requirements, including modification of PAD parameters.

Accounting

Accounting information is collected and is made available to the user via a report writing utility.

For incoming X.29 calls, no information can be retrieved relating to the process or account onto which a user is logged.

Security

An extensive security facility is provided. Control of remote access to the system (incoming security) and local access to the network (outgoing security) are supported. Incoming and outgoing security can be based on any combination of:

- Normal or reverse charging
- DTE number
- Network (PSDN)
- Process (or user) making the outgoing call

- Application handling the incoming call

Network Management

The Network Control Language (NCL) is provided for the management of HP X.25 for OpenVMS and DECnet-Plus. NCL provides network management facilities to:

- Define outgoing call destinations
- Define incoming call handling
- Modify X.25 frame and packet levels parameters
- Define security parameters
- Modify network configuration
- Monitor connection statistics
- Perform network maintenance functions

The network manager can be notified of significant network events such as security violations or network failures through the event logging facility.

Problem solving is facilitated by the Common Trace Facility (CTF) provided with the OpenVMS operating system. CTF enables the user to trace and analyse frames passing between the PSDN and the X.25 for OpenVMS systems. In V1.5, the Common Trace Facility (CTF) for OpenVMS X.25 functionality has been updated to match the functionality of PSI Trace for the OpenVMS VAX X.25 product. This includes the following capabilities:

- The ability to trace a circuit given the NWA device name
- The ability to trace an X.29 port
- The ability to trace an individual X.25L3 circuit

Communications Interfaces for Alpha

Refer to the tables in this Software Product Description and consult your local hardware service provider for complete information on the synchronous controller cards supported by HP X.25 for OpenVMS Alpha Systems, as well as a list of the relay/connector nodes that may be used as X.25 gateways to the LAN.

Note: X.25 on I64 does not support synchronous device drivers and synchronous communications options.

In addition to the devices listed in this Software Product Description, operation over CSMA/CD (ISO 8802/3) and FDDI (ISO 9314) networks is supported via the LLC2 protocol or via TCP/IP using RFC 1613.

Wide Area Network (WAN) Device Drivers

The WAN device drivers included in X.25 for OpenVMS Alpha Systems support synchronous communications. The device drivers all offer a supported user (\$QIO) interface.

The device drivers all support full-duplex HDLC framing.

In all cases, the data throughput over the synchronous lines is dependent on the user applications and system environment.

The device drivers support modem control signals (DTR, DCD, DSR, RTS and CTS) where these signals are provided by the selected electrical interface.

Supported controllers for Alpha are listed in Table 4.

WAN device drivers include a pseudodriver (WAN-DRIVER) that provides a programming interface to the Data Link level for the LAPB, DEC-HDLC, and LLC2 protocols. The pseudodriver also provides an interface to the physical layer of the synchronous communications devices supported by the product. The physical layer interface provides the ability to read and write HDLC formatted frames (leading/trailing flag, HDLC frame check sequencing, HDLC bit stuffing), but protocol interpretation of the frames must be provided by the user application using the interface.

Optional Facility Support

Table 1 describes the Optional User Facilities of the 1988 ITU/TSS X.25 recommendations that HP X.25 for OpenVMS supports.

Support for any facility is dependent on the PSDN used. The product documentation describes specific facility availability for supported PSDNs.

Table 1
Optional User Facilities Support

ITU/TSS X.25 (1988) reference	Optional User Facility	Support ¹
6.1	On-line facility registration	no
6.2	Extended packet sequence numbering	yes
6.3	D bit modification	n/a
6.4	Packet retransmission	no
6.5	Incoming calls barred	n/a
6.6	Outgoing calls barred	n/a
6.7	One-way logical channel outgoing	yes

6.8	One-way logical channel incoming	yes
6.9	Non-standard default packet sizes	yes
6.10	Non-standard default window sizes	yes
6.11	Default throughput class assignment	yes
6.12	Flow control parameter negotiation	yes
6.13	Throughput class negotiation	yes
6.14.1	Closed User Group (CUG)	yes
6.14.2	CUG with outgoing access	yes
6.14.3	CUG with incoming access	yes
6.14.4	Incoming calls barred within a CUG	n/a
6.14.5	Outgoing calls barred within a CUG	n/a
6.14.6	CUG selection	yes
6.14.7	CUG with outgoing access selection	yes
6.15.1	Bilateral Closed User Group (BCUG)	yes
6.15.2	BCUG with outgoing access	n/a
6.15.3	BCUG selection	yes
6.16	Fast select	yes
6.17	Fast select acceptance	n/a
6.18	Reverse charging	yes
6.19	Reverse charging acceptance	n/a
6.20	Local charging prevention	n/a
6.21.3	NUI selection	yes
6.22	Charging information	yes
6.23.2	RPOA selection	yes
6.24	Hunt group	no ²
6.25.1	Call redirection	n/a
6.25.2.2	Call deflection selection	no
6.25.3	Call redirection or call deflection notification	yes
6.26	Called line address modified notification	no
6.27	Transit delay selection and indication	yes
6.28	TOA/NPI address selection and indication	no
7.1	Non-X.25 facilities	yes
G.3.1	Calling Address Extension	yes
G.3.2	Called Address Extension	yes
G.3.3.1	Minimum throughput class	yes
G.3.3.2	End-to-end transit delay	yes
G.3.3.3	Priority	yes
G.3.3.4	Protection	yes
G.3.4	Expedited data negotiation	yes

¹Refers to those features of a facility that are relevant to the operation of a DTE. "n/a" refers to DCE facilities requiring no action from the DTE.

²The individual DTEs must be assigned addresses independent of the hunt group address.

INSTALLATION

HP recommends that a customer's first purchase of this software product include HP Installation Services. These services provide for installation of the software product by an experienced HP Software Specialist. Only customers experienced with HP's X.25 products should attempt installation.

Customer Responsibilities

In some cases, the X.25 network supplier may impose restrictions, limitations, or requirements on the proposed HP network configuration. The customer must ensure these are understood and adhered to for each network.

Before installation of the software, the customer should:

- Install all requisite software and hardware, including terminals.
- Obtain, install, and demonstrate as operational any modems and other equipment and facilities necessary to interface to HP's communication equipment.
- Demonstrate equivalence of operation for modems other than Bell 208A, 208B, 209, 212A synchronous modems, or, in Europe, employ only PTT approved modems.
- Subscribe to the Open User Group and to at least two SVCs to complete the product's installation check-out (this test loops information from the X.25 for OpenVMS system to the PSDN and back to the X.25 for OpenVMS system). Systems in Closed User Groups only, or where the PSDN does not support calls to the originating DTE address, require specially negotiated arrangements for HP to install the product.
- Make available for a reasonable period of time, as mutually agreed by HP and the customer, all hardware, communication facilities and terminals that are to be used during a HP supervised installation.

HARDWARE REQUIREMENTS

Please reference the OpenVMS Alpha and I64 Software Product Description (SPD 41.87.XX) for supported hardware.

This section lists the Alpha processors that are supported by OpenVMS Alpha Version 8.2.

DEC 4000 Model 600/700 series ¹
 DEC 7000 Model 600 ¹
 DEC 10000 Model 600 ¹
 DEC 3000 Model 300/300L/300LX/300X ²

¹ No synchronous communication option available. Connection available only via LLC2.

² Only standard workstation configurations support use of the SCC.

System Memory Required for Alpha

In addition to the memory requirements of OpenVMS Alpha and user applications, the minimum memory requirements of HP *X.25 for OpenVMS Alpha Systems* are:

- 2.5 Mbytes for software and data structures
- 40 Kbytes for each active virtual circuit in a Client configuration
- 10 Kbytes for each active virtual circuit in a directly connected configuration
- 7 Kbytes for each DTE configured to use XOT

System Memory Required for I64

In addition to the memory requirements of OpenVMS I64 and user applications, the minimum memory requirements of HP *X.25 for OpenVMS I64 Systems* are:

- 6.25 Mbytes for software and data structures
- 10 Kbytes for each active virtual circuit in a directly connected configuration
- 120 Kbytes for each DTE configured to use XOT

These figures represent an upper bound only and should be used as a guide to sizing a system to provide adequate X.25 performance. The product will require less memory than quoted. However, an underconfigured system will display reduced performance, not only for X.25 communications but also for other processes.

Communication Devices Required for Alpha

HP *X.25 for OpenVMS Alpha Systems* requires one or more synchronous controller cards when directly connected to one of the following:

- a PSDN via the X.25 protocol;
- another system using DECnet-Plus over X.25; or
- another HP system using DECnet-Plus over DEC-HDLC.

The devices available on the supported processors are listed in Table 4. For additional information on the configuration and performance of these devices see the *CONFIGURATION GUIDELINES* section.

For operation using the ISO 8802-2 protocol (LLC2) the product requires a Local Area Network (LAN) device. The product supports HP's ISO 8802-3 (CSMA/CD) and ISO 9341 (FDDI) devices for use with the LLC2 protocol.

For operation over LLC2 to an X.25 relay node, the supported relay nodes are

- DEC Network Integration Server (DECNIS) 500/600 (SPD 36.05.xx)

- Alpha system running WAN Support for HP UNIX (SPD 42.47.xx) configured for X.25 relay

For operation over DECnet (using the Gateway Access Protocol, GAP), the supported connector nodes are:

- DEC Network Integration Server (DECNIS) 500/600 (SPD 36.05.xx)
- DECnet-Plus V7.3 (or later) for OpenVMS VAX configured for X.25 multi-host operation (SPD 25.03.xx).
- DECnet-Plus V8.2 (or later) for OpenVMS Alpha (SPD 50.45.xx)

For operation using RFC 1613 for X.25 over TCP/IP (XOT), the product requires specific versions of OpenVMS, DECnet-Plus, and TCP/IP Services for OpenVMS software. See the SOFTWARE REQUIREMENTS section. The TCP/IP software must provide support for the PWIP driver. TCP/IP Services for OpenVMS and some third-party TCP/IP products provide PWIP driver support. A communication controller appropriate for the TCP/IP software will also be required.

For additional information on the configuration and performance of these relay nodes, consult your local hardware service provider and relevant Software Product Descriptions.

X.25 V2.0 for OpenVMS I64 systems Methods for Communication

The X.25 V2.0 release for OpenVMS I64 system provides support for communication via:

- GAP (X.25 over DECnet)
- LLC2 (X.25 over LAN)
- XOT (X.25 over TCP/IP)

These methods require an external machine to act as a gateway or relay to the X.25 connection or PSDN. This machine provides the interface for the actual synchronous line and may be implemented using an OpenVMS Alpha system with a PBXDP or PBXDD synchronous communication controller, or a third party dedicated router.

X.25 native communication using a synchronous communication controllers on OpenVMS I64 system will not be supported.

For more information please refer to the *HP X.25 for OpenVMS-Configuration manual*.

Disk Space Required

**Table 2
Disk Space Required**

Alpha	The disk space required for installation and use of the product is 15,000 Blocks (7.5 Mbytes)
I64	The disk space required for installation and use of the product is 28,752 Blocks (14.03 Mbytes)

This size is approximate. The actual size will vary depending on the user's system environment, configuration, and software options.

OPTIONAL HARDWARE

Additional communications devices, subject to limitations described in the *CONFIGURATION GUIDELINES* section of this SPD.

SOFTWARE REQUIREMENTS

- OpenVMS Operating System for Alpha Version 8.2 and I64 Versions 8.2 and 8.2-1
- DECnet-Plus for OpenVMS Version 8.2 and 8.2-1
- OpenVMS Alpha and I64 TCP/IP Services V5.5

GROWTH CONSIDERATIONS

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

SUPPORTED PUBLIC NETWORKS

Table 3 shows the public PSDNs supported by the product in the countries shown. In addition, certain private PSDNs have been tested by HP and appropriate profiles have been included with the product. For more detail, consult your local HP office.

**Table 3
Supported Public Networks**

Country	Public Networks ¹
Argentina	Arpac
Australia	Austpac
Austria	Datex-P
Belgium	DCS

¹Trademarks under which these services are offered are proprietary to the respective PTTs.

Table 3 (Cont.)
Supported Public Networks

Country	Public Networks ¹
Brazil	Renpac
Canada	Datapac, Infoswitch
Chile	VTRnet
Denmark	Datapac
Eire	Eirpac
Finland	Datapac
France	Transpac
Germany	Datex-P
Hong Kong	Datapac, Inet, Intelpac
Indonesia	SKDP
Ireland	Ciepac
Italy	Itapac
Japan	CC-VAN, DDX-P 80/84, Jaisnet, Tymnet®, Venus LP
Luxembourg	Luxpac
Malaysia	Maypac
Mexico	Telepac
Netherlands	Datanet 1
New Zealand	Pacnet
Norway	Datapac
Pakistan	Paknet
Philippines	Datanet
Portugal	Telepac
Singapore	Telepac
South Korea	Dacomnet
Spain	Iberpac
Sweden	Datapac, Datapak II
Switzerland	Telepac
Taiwan	Pacnet
Thailand	Thaipac
Turkey	Turpac
United Kingdom	PSS ² , Postgem, Mercury
United States	Accunet, Autonet®, Bell Atlantic CompuServe®, ConnNet, FedexITC, FreedomNet II, Impacs, Infonet, Mark*Net Extended Service, Pacific Bell PPSnet, Pulsenet, Sprintnet, Telenet®, Tymnet, US West Digipac, Western Union PTN-1, Worldnet

¹Trademarks under which these services are offered are proprietary to the respective PTTs.

²PSS is supported only when the Extended Facilities option has been subscribed.

CONFIGURATION GUIDELINES

For direct connection of the Alpha system to the PSDN, operation of the product requires the use of one or more synchronous controller cards. The following devices are supported by HP *X.25 for OpenVMS Systems*:

- *PBXDD-Ax*
 - A range of single slot multi-port (2 and 4) serial synchronous communications PCI adaptors.
- *PBXDP-Ax (retired December 2000)*
- *PBXDI-Ax*
 - A range of single slot dual port serial synchronous communications ISA adaptors.
- *DNSES*
 - Single slot dual port serial synchronous communications EISA adapter.
- *WANcontroller 720 (DSYT1)*
 - Single slot dual port TURBOchannel serial synchronous communications adapter.
 - For systems with no available TURBOchannel slots, an extender box may be required.
- *Integral SCC device*
 - A single port multi-function device on the system motherboard. Only the synchronous communications function is supported.
 - Limited modem signaling capabilities. Local and remote loopback signals and DTE-sourced clock are not provided.

Additional factors to consider when configuring hardware devices for use with the product are:

- Hardware configuration limits, such as power supply, backplane space, bus throughput, mapping registers, and any other restrictions on the number of devices per CPU or per bus must be observed. Consult your local hardware service provider for further information.
- CPU utilization. Ensure sufficient CPU power will be available to drive the required number of lines at the desired speeds and leave sufficient margin for application processing.

The supported devices available on each system are given in Table 4. The operational characteristics of each device are given in Table 5.

Table 4
Synchronous Controllers for Alpha

System	Devices supported
DEC 2000 Models 300/500	DNSES
DEC 3000 Model 300L	SCC ¹
DEC 3000 Models 300/300LX/300X	SCC ¹ , DSYT1
DEC 3000 Models 400/400S	SCC, DSYT1
DEC 3000 Models 500/500S/500X	SCC, DSYT1
DEC 3000 Models 600/600S	SCC, DSYT1
DEC 3000 Models 700,700LX	SCC, DSYT1
DEC 3000 Models 800/800S	SCC, DSYT1
DEC 3000 Models 900,900LX	SCC, DSYT1
DEC 4000 Models 600/700	N/A ²
DEC 7000 Model 600	N/A ²
DEC 10000 Model 600	N/A ²
Digital 2100 Server A500MP	DNSES, PBXDP-Ax
Digital 2100 Server A600MP	DNSES, PBXDP-Ax
AlphaServer 300 4/266	PBXDI-Ax, PBXDP-Ax
AlphaServer 400 4/166/ 4/233	PBXDI-Ax
AlphaServer 800 5/333, 5/400, 5/500	PBXDP-Ax
AlphaServer 1000 4/233, 4/266, 5/300	DNSES, PBXDP-Ax
AlphaServer 1000A 4/233, 4/266, 5/266, 5/333, 5/400, 5/500	DNSES, PBXDP-Ax
AlphaServer 1200 5/333	DNSES, PBXDP-Ax
AlphaServer 2100 4/200, 4/233, 4/266, 4/275, 5/250, 5/300	DNSES, PBXDP-Ax
AlphaServer 2100A/2100A LP 4/275, 5/250, 5/300	DNSES, PBXDP-Ax
AlphaServer 4000 5/300, 5/300E, 5/400, 5/466	DNSES, PBXDP-Ax
AlphaServer 4100 5/300, 5/400	DNSES, PBXDP-Ax
AlphaServer 8200 5/300, 5/350, 5/400, 5/440, 5/625	DNSES, PBXDP-Ax
AlphaServer 8400 5/300, 5/350, 5/400, 5/440, 5/625	DNSES, PBXDP-Ax

AlphaServer DS10, DS10L	PBXDP-Ax, PBXDD-Ax
AlphaServer DS20	PBXDP-Ax, PBXDD-Ax
AlphaServer DS20E	PBXDP-Ax, PBXDD-Ax
AlphaServer ES40, ES45	PBXDP-Ax, PBXDD-Ax
AlphaServer GS40	PBXDP-Ax, PBXDD-Ax
AlphaServer GS60, GS60E	PBXDP-Ax, PBXDD-Ax
AlphaServer GS80	PBXDP-Ax, PBXDD-Ax
AlphaServer GS140	PBXDP-Ax, PBXDD-Ax
AlphaServer GS160	PBXDP-Ax, PBXDD-Ax
AlphaServer GS320	PBXDP-Ax, PBXDD-Ax
Digital 2100 Server A500MP, A600MP	DNSES, PBXDP-Ax
DIGITAL Personal Workstations 500au, 433au, 600au	PBXDP-Ax, PBXDI-Ax
AlphaStation 200 4/100, 4/166, 4/233	PBXDI-Ax, PBXDP-Ax
AlphaStation 250 4/266	PBXDI-Ax, PBXDP-Ax
AlphaStation 255/233, 255/300	PBXDI-Ax, PBXDP-Ax
AlphaStation 400 4/166, 4/233, 4/266	PBXDI-Ax, PBXDP-Ax
AlphaStation 500/266, 500/333, 500/400, 500/500	PBXDP-Ax
AlphaStation 600 5/266, 5/333	DNSES, PBXDP-Ax
AlphaStation 600A 5/500	DNSES, PBXDP-Ax
AlphaStation XP1000	PBXDP-Ax
Alpha 21064/21064A PCI reference board (EB64+)	PBXDP-Ax, PBXDI-Ax
Alpha 21164 PCI reference board (EB164)	PBXDP-Ax, PBXDI-Ax
Alpha PC64 reference board (APC64)	PBXDP-Ax, PBXDI-Ax
Alpha 4/233 PICMG SBC	PBXDP-Ax, PBXDI-Ax
Alpha 4/266 PICMG SBC	PBXDP-Ax, PBXDI-Ax
Alpha 5/366 PICMG SBC	PBXDP-Ax, PBXDI-Ax
Alpha 5/500 PICMG SBC	PBXDP-Ax, PBXDI-Ax

¹ Only standard Workstation configurations support use of the SCC.

² No synchronous communication option available. Connection available only via LLC2.

Table 5
Synchronous Controller Characteristics

Device	Max. line speed (Kbps)	Max. HDLC data size (bytes)	Max.X.25 data size (bytes) ¹	Supported interface standards
PBXDP-Ax PCI	2x2400, 4x2400 or 8x1200	8300	4096	EIA-232 EIA-422 EIA-423 EIA-530 V.24/V.28 V.35 X.21 ² EIA-485
PBXDD-Ax PCI	2x2400, 4x2400	8300	4096	EIA-232 EIA-449 EIA-530 X.11 V.24/V.35
PBXDI-Ax ISA	2x2400, 4x2400	8300	4096	EIA-232 EIA-530 V.24/V.28 V.35 X.21 ²
DNSES EISA	2x64 or 1x2000	4080	2048	EIA-232 EIA-422 EIA-423 V.10/V.11 V.24/V.35
DSYT1 Turbo Channel	2x64 or 1x2000	4080	2048	EIA-232 EIA-422 EIA-423 V.10/V.11 V.24/V.35
SCC	19.2	1018	512	EIA-232 V.24

¹Fragmentation of larger data sizes is supported.

²X.21 electrical levels and connector in data-leads only communication. X.21 call control is **not** supported.

DISTRIBUTION MEDIA

This software and documentation are available on the HP CD-ROM Software Library for OpenVMS. The software documentation is also available in hardcopy format.

ORDERING INFORMATION

Alpha:

Software Licenses: QL-0THA9-**
Software Media/Documentation: QA-03XAA-H8
Software Documentation (hardcopy): QA-0THAA-GZ
Software Product Services: QT-0THA*-**

I64:

Software Licenses: BA390AC
Software Media/Documentation: BA390AA
Software Documentation (hardcopy): BA390MN

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

SOFTWARE LICENSING

Specific functions of the HP *X.25 for OpenVMS* product is enabled by the licenses described in Table 6.

Table 6
Software Licenses

License	Function Enabled
DECnet-Plus	CONS over LAPB, LLC2, GAP, or XOT. CLNS over DEC-HDLC.
HP X.25 for OpenVMS	All functions over LAPB, LLC2, and XOT.
HP X.25 Client for OpenVMS Alpha Systems	All functions over LAPB and LLC2.

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