
X.25/9000 Link

Technical Data

**For the HP 9000 Series 300/400,
700, and 800
Product Numbers
36941A, J2159A, and 36960A**

The X.25/9000 Link product for the HP 9000 Series 300/400, 700, and 800 provides a network connection on the HP 9000 Series 300/400, 700, or 800 systems to private and public X.25 networks. This product conforms to the 1984 CCITT recommendations.

This product allows HP 9000-to-HP 9000 communications as well as HP 9000 to other systems (HP or non-HP) over X.25 networks, through the use of ARPA services and UNIX[®]-to-UNIX Copy (UUCP).

Remote display terminals are supported by implementation of host PAD capability (CCITT recommendation X.3 and X.29) on the X.25/9000 Link product. Host PAD emulation and remote PAD printer is also supported by the X.25/9000 Link product.

NFT, HP's Networking Services product, is supported for communications between HP 9000 or between HP 9000 and HP 3000 computers. In addition, the X.25/9000 Link product provides programmatic access (through Berkeley sockets) to X.25 packet layer 3 and via TCP provides access to HP's NetIPC. This allows customers to develop their own protocol and services for communication with remote HP or non-HP systems over an X.25 network.

The X.25/9000 Link product supports OSI services environment when implemented with the OTS/9000 product. The X.400/800 product allows customers to exchange electronic mail using the X.400 protocols over the X.25/9000 Link (Series 800 only).

Features and Benefits

- Compliance with industry and international standards
 - Supports ARPA/Berkeley Services (except ruptime and rwho) for HP 9000 computers over the X.25/9000 Link
 - Supports NFT for HP 9000-to-HP 9000, HP 9000-to-HP 3000 communications
 - Supports layer 3 interoperability for HP 9000-to-HP 1000, HP 9000-to-HP 3000 communication
 - Provides ability to write customized programs to layer 4 over TCP/IP via BSD and NetIPC. (ARPA Services/9000 are required for application development using Berkeley services.)
 - Implements industry-standard Defense Advanced Research Project Agency (DARPA) TCP/IP protocols
 - Complies with the 1980 and 1984 CCITT recommendation for X.25

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- Complies with the U.S. Defense Data Network (DDN) TCP/IP-X.25 standard protocols
 - Certified on major public and private networks
 - Customized application support
 - Provides programmatic user access to X.25 packet layer 3 for multivendor and customer-designed communications via Berkeley Sockets or NetIPC via TCP
 - Ease of Use
 - Extensive diagnostic tools
 - Menu-driven configuration product
 - Cost-effective remote terminal connections
 - Implementation of host PAD capability (complies with the 1984 CCITT recommendation X.3 and X.29)
 - Provides PAD Emulation for incoming and outgoing access
 - Provides remote PAD printing capabilities
 - Transparent access over multiple nodes and networks
 - Dynamic packet routing and gateway capabilities through the use of ARPA/Berkeley services over Internet Protocol (IP)
 - Dynamic packet routing and gateway capabilities through the use of Open Systems Interconnection OSI when used with X.400
 - Provides interface with UNIX-to-UNIX copy (UUCP)

Functional Description

An HP 9000 computer with the X.25/9000 Link product is capable of simultaneously originating calls to and receiving calls from other computers over an X.25 network. It can be configured as a DTE (Data Terminal Equipment) to run over a public or private X.25 network at speeds up to 19.2 Kbps for Series 300 and 400 DIO systems, and 64 Kbps for Series 700 and 800 systems. It can also be configured as a DCE (Data Circuit-terminating Equipment) to run over point-to-point lines (by using a modem or a modem eliminator).

The OSI Transport Services (OTS) product supports TPO.2. OTS is required for use with the X.400/800 product.

Remote Terminal Connection

Remote asynchronous character-mode HP terminals connected to public or private PADs such as the HP 2335A can transparently access any HP 9000 Series 300, 400, 700, or 800 computer over the same X.25 line, for increased connectivity and lower communications cost. This is accomplished through the implementation of the 1984 CCITT recommendation for X.3 and X.29

Programmatic Access

The X.25/9000 Link product also provides a message-based programmatic interface to the X.25 packet layer 3 to establish communications with remote HP or non-HP applications. The programmatic interface (through Berkeley sockets) provides this capability independent of the remote computer's protocols. It consists of routines that are accessible from C programs. This interface is fully compatible (except for D-bit parameter handling) across the HP 9000 family and allows easy migration of the software developed on this interface.

X.32 Recommendation

The X.25/9000 Link offers support for some X.32 capabilities (procedures 1,2,5 and 6). The main interest of X.32 is related to the identification of the calling DTE.

- For security reasons
- To allow the network (PSPDN) to identify the calling DTE
- To charge the calling DTE for the communication cost
- To allow the called DTE or the PSPDN to accept or refuse the reverse charge

Supported X.25 Network Parameters

Layer 1

- X.21 bis (RS-232-C, CCITT V24/V28) for line speeds from 1200 bps to 19.2 Kbps
- V.35 (Series 700 and 800 only) for line speeds from 1200 bps to 64 Kbps
- Operates as a DTE
- For an X.21 physical interface cable, contact your HP Sales Representative for a list of recommended third-party products.

Layer 2

- LAP-B protocol
- Frame sizes: as required for layer 3 packet sizes
- Window sizes: 1-7
- Modulo 8 frame sequence numbering
- Configurable maximum number of retransmissions (0 to 255)
- Configurable retransmission timer (1 sec to 12 sec)
- Operates as a DTE or DCE

Layer 3

- One-way/two-way (incoming and outgoing) Switched Virtual Circuits (SVC)
- Permanent Virtual Circuits (PVC) (not supported in a host PAD support configuration)
- Qualifier bit (Q-bit) for X.25 packet level 3 applications only
- More-data bit (M-bit)
- Packet sizes: 128 or 256 bytes for Series 300 and 400; 16 to 4096 bytes for Series 700 and 800
- Window sizes: 1-7

- Maximum Virtual Circuits: 32 (128 byte packets) for Series 300 and 400; 64 (128 byte packets) for Series 800 Mid-Bus processors; 256 (128 byte packets) for Series 700 and 800 NIO processors
- Modulo 8 packet sequence numbering
- Throughput class: 3 to 11 for Series 300 and 400; 3 to 12 for Series 700 and 800
- Operates as a DTE or DCE

Supported and Recommended Products

Certified X.25 Packet Switched Networks

The following is a partial list of X.25 Networks that have certified the X.25/9000 Link product. Contact your HP Sales Representative for additional information.

HP PPN	Datex-P
Datapac	Datapak
Transpac	Pacnet II
PSS	Telenet
Tymmnet	

Verified X.25 Switching Equipment

- HNS MACOM 9600 NPX
- HNS MACOM 9724 RPX
- HP PPN Model 70 Release 1
- HP PPN Model 80 Release 2

Supported Pad Devices

- HP 2334A Plus
- HP 2335

Note: HP 2334A Plus and HP 2335A HP-defined local PAD parameters are not supported.

Supported Terminals And PCs (for use in host PAD configuration)

- HP 700/41
- HP 700/92
- HP 700/94
- HP 700/22
- HP 2392A
- HP 2393A
- HP Vectra (used with AdvanceLink and Reflection terminal emulation)

Verified Modems

Modem	Verified Speed(s), BPS
Black Box SME V.35	1200,7200,64000
CIT Alcatel	
V35 ER BdB 144/20	48000,64000
CODEX 2345	4800, 7200, 9600
HP 37230A	4800, 7200, 9600, 19200
Racal Milgo MPS 1222	9600

Interoperability

The following configurations have been tested and are currently supported:

	Level 3	NS	ARPA
HP 9000-to-SUN	X		X
HP 9000 through Cisco AGS router		X	X
HP 9000-to-HP 1000	X		
HP 9000-to-HP 3000/V	X	X	
HP 9000-to-HP 3000/XL	X	X	
HP 9000-to-Apollo			X

Supported Applications

(for use in host PAD configuration)

- All HP-UX applications, with the exception of block-mode applications, and mail exchange.

Configuration Requirements

Series 300/400

- HP-UX Operating System Version 8.0 or later (X.25 and HP-UX versions must be the same)
- Minimum Central Memory: 4 Mbytes
- Minimum free disk space: 2.4 Mbytes
- Supported Processors: 320, 330, 332, 340, 350, 360, 370

Series 700

- HP-UX Operating System Version 8.05 or later (X.25 and HP-UX versions must be the same)
- Minimum Central Memory: 4 Mbytes
- Minimum free disk space: 2.4 Mbytes
- Supported Processors: 720, 730, 750

Series 800

- HP-UX Operating System Version 8.0 or later (X.25 and HP-UX versions must be the same)
- Minimum central memory: 8 Mbytes
- Minimum free disk space: 3.4 Mbytes
- Supported processors: 807, 808S, 815S, 817, 822, 825S, 825SRX, 825CHX, 827, 832, 835S, 835SE, 835SRX, 835CHX, 837, 840S, 842, 845, 847, 850S, 852, 855, 857, 860, 865, 870

Installation Policy

Customer Responsibility

The customer is responsible for the installation of the X.25/9000 Link product.

Before installing X.25/9000, the customer should obtain, install, and verify the correct operation of any communication line, X.25 network access, or any other equipment and facilities necessary to interface to the X.25/9000 Link product.

HP Responsibility

Hewlett-Packard is only liable for the correct execution of the product self-tests. All other hardware and software connections to the communication line, the X.25 network and non-HP computers are the customer's responsibility.

Product Structure

The X.25/9000 Link product includes an X.25 networking card, software, customer documentation, and the necessary cables for connection to the customer's modem.

Ordering Information

Series 300/400

36941A X.25/300 and X.25/400 Link for the HP 9000 Series 300 and Series 400; includes an RS-232-C (DTE) cable (5m) and software

1AW Credit for software; used if an additional X.25 card is needed in the SAME HP 9000

0CC Revision upgrade for users not on support services

Series 700

J2159A X.25/9000 Link for the HP9000 Series 700

1AT RS-232-C Cable

1AU V.35 Cable

OBO Delete all manuals

1AW Delete software. For additional cards only

OCC Revision upgrade for users not on support services

Series 800

36960A X.25/9000 Link for the Series 800

Must order **one** feature in the following options:

Processor License Options:

AH0 License to use on Tier 1

AEL License to use on Tier 2

AE5 License to use on Tier 3

AE6 License to use on Tier 4

AEN License to use on Tier 5

AEP License to use on Tier 6

AH1 License to use on Tier 7

Processor Hardware Options:

20N For 807/808/815/817/822/827/832/837/842/847/852/857/887/897/890 1, 2, 3, 4

20C For 635/645/825/835/840/845/850/855/860/865/870

Media Options:

Documentation is included when a media option is selected.

AA0 Software on ¼-inch cartridge tape

AA1 Software on ½-inch magnetic tape (1600 bpi)

AAH Software on Digital Audio Tape (DAT)

AAU CD-ROM Certificate

Interface Cable Options:

IAT RS-232-C (DTE) cable (5m)

1AU V.35 cable (5m, Series 800 only)

Note: This cable complies with the U.S. standard which does not comply to European standards. A universal adapter is required for complying to European standards.

May order **one** feature in the following options:

Documentation Options:

OB0 Deletes all the manuals

Hardware Only, Credit Options:

1AW Deletes software on Tier 1 processor

2A1 Deletes software on Tier 2 processor

2A2 Deletes software on Tier 3 processor

2A3 Deletes software on Tier 4 processor

2A4 Deletes software on Tier 5 processor

2A5 Deletes software on Tier 6 processor

2A6 Deletes software on Tier 7 processor

Software Upgrade, Credit Options:

Requires previous purchase of X.25 Link for the Series 800. Upgrades are allowed only for SPU's within the same Processor Hardware Option (see 20N and 20C above).

Processor Upgrades:

OGR for return credit for Tier 1

OGE for return credit for Tier 2

OC8 for return credit for Tier 3

OGS for return credit for Tier 4

OGT for return credit for Tier 5

OGU for return credit for Tier 6

Additional cables may be ordered:

28606-63006 RS-232-C

28606-63003 V.35 (for Series 700 and 800 only)

Note: This cable complies with the U.S. standard, which does not comply with European standards. A universal adapter is required to comply with European standards.

Support Products

H2012A+L00 BaseLine
Software Support
H2011A+H00 ResponseLine
Software Support
H2010A+T00 Teamline
Software Support
H2014A+S00 Software Update
Materials

Customers with ResponseLine and Teamline support for the HP-UX Operating System will automatically receive this same level of support (ResponseLine and Teamline) for the X.25/9000 Link product. Customers with hardware support agreements must add the appropriate level of coverage (Priority, Priority Plus, or Next Day Service) for this link product to their support agreement.

Documentation

The following Hardware installation manuals are included with each product:

Series 300/400:
36941-90002 X.25/300 Link
Hardware Installation Manual

Series 700:

J2159A-90001 Series 700
Hardware Installation Manual

Series 800:

30263-90001 Series 800
(825/835/840/845/850/855/860/
865/870) Central Bus PSI Card
Installation Manual
28606-90001 Series 800 Models
808/815/822/832/842/852
HP-PB Programmable Serial
Interface Hardware Installation
Guide

The following manuals are included with all X.25/9000 Links. Additional copies may be ordered from HP:

36940-90001 X.25/9000
Programmer's Guide
36940-90004 Installing and
Administering X.25/9000
36940-90005 Troubleshooting
X.25/9000
B1012-91012 HP 9000
Networking Overview
5958-3402 X.25: The PSN
Connection

Related Documentation

The following manuals may be ordered separately:

98194-60527 NetIPC
Programmer's Guide
98194-60525 Berkeley IPC
Programmer's Guide

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