

# X.25 iX Network Link For HP 3000 Series 900

## Technical Data

**Product Numbers**  
**J2070A, J2079A, 36939A,**  
**D2355A, 2340A, 2343A**

### Introduction

The X.25 iX network link is a high performance networking solution that provides connectivity to public and private X.25 packet switching networks for HP 3000/900 computers.

Based on the modular architecture of the Datacommunications and

Terminal Controller (DTC) product, X.25 iX network link offers an integrated, flexible and scalable X.25 solution for HP 3000/900 computers in multi-systems, multi-vendors and PAD terminal access environments.

For information on other DTC products, refer to the DTC family datasheet (which

presents the complete DTC family, the target environments, and supported devices) and to the individual product datasheets:

|                        |           |
|------------------------|-----------|
| DTC 16TN:              | HP J2060A |
| DTC 72MX:              | HP J2070A |
| DTC 16iX:              | HP J2062A |
| DTC16:                 | HP 2340A  |
| DTC48:                 | HP 2345A  |
| DTC Management:        | HP D2355A |
|                        | HP J2120A |
| X.25 iX Network Link:  | HP J2079A |
| HP 3000 Telnet Access: | HP J2080A |

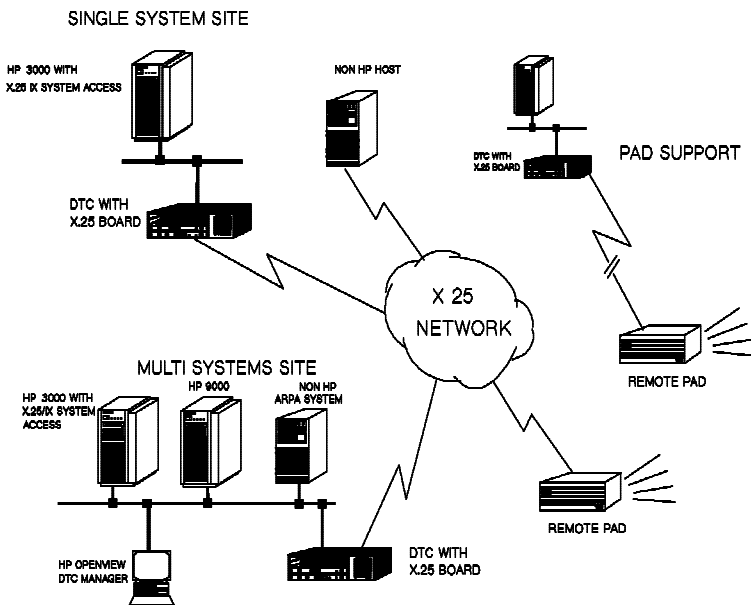
(also included in the Networking Communications Specification Guide).

### Product highlights

The X.25 iX network link for HP 3000/900 computers is a X.25 connectivity solution based on the DTC hardware and software architecture, consisting of 3 separate components:

- DTC/X.25 network access card
- X.25 /iX system access
- DTC/X.25 management.

The X.25 iX network link achieves high performance networking by offloading protocol processing from the HP 3000/900 host to an



---

optimized Network Access card in the DTC. The LAN-based architecture of the DTC allows multiple HP 3000/900 hosts to share the same X.25 line, making cost-effective use of the X.25 network subscription.

#### **DTC/X.25 network access card**

This product is available for DTC 16 and DTC 72MX. The product is based on a high performance VLSI card residing in the DTC, used to process the X.25 protocols. The necessary software is downloaded to the DTC by the DTC management platform (HP 3000/900 or DTC management Openview Windows workstation).

The DTC/X.25 Network Access card features:

- X.25 protocol handling.
- Support of remote PAD access function (CCITT X3, X28 and X29) allowing access to multivendor hosts (HP 3000/900 and Telnet-TCP/IP hosts) for terminals, PCs and printers attached to remote X.25 PADs. PAD access can be either direct to a single host, or user-selectable to any host on the LAN, through the DTC user interface.

Connectivity of remote PAD terminals can be secured and restricted using PAD access lists, based on calling X.25 addresses and configured by the DTC /X.25 management product. Security on remote X.25 host access is implemented with Local User Group utility, which filters incoming and outgoing calls

based on calling and called X.25 addresses respectively.

#### **X.25/iX System Access**

This software product resides on the HP 3000/900 computer. It provides interconnection of Defense Advanced Research Projects Agency (DARPA) TCP/IP protocols (layers 3 & 4 of the OSI reference model) with X.25 layer 3 of the DTC/X.25 Network Access software across the IEEE 802.3 LAN. Note that X.25 iX System Access is not an X.25 protocol implementation, but provides an X.25 addressing and facility interface between the HP 3000/900 computer and the DTC.

This product allows system to system communication with remote computers, either using NS/3000iX Network services (HP 36920A), ARPA FTP service (HP 36957A), or OSI FTAM service (HP 36971A and HP 36972A).

SNA connectivity for HP 3000/900 to IBM communication over X.25 is provided by the SNA/X.25 link/iX product (HP 30298A), which allows HP SNA services to be supported over an X.25 network. (Refer to the SNA/X.25 link/iX datasheet for more information).

Programmatic access to X.25 level 3 is included, to allow users to develop their own protocols and services for communication with remote HP or non-HP computers over X.25 link.

#### **DTC/X.25 management**

This product is part of the DTC Manager application. It performs the X.25 iX network link configuration and management operations. Depending on customer network topology and requirements, the DTC/X.25 management product can be installed on two different platforms:

- On a HP 3000/900: in this case, the product can only manage DTC/X.25 network links dedicated to this HP 3000/900 computer.
- On an HP Openview Windows workstation. In this case, up to 60 X.25 iX network links can be simultaneously managed by a single HP Openview Windows workstation.

HP Openview (PC-based) DTC Manager software provides an easy to use graphical user interface and the possibility of integrating management applications for other network elements (Switch/Pad Manager for 2335 and Model 45Plus, Openview Sysman) on the same Openview Windows workstation.

#### **Product specifications**

##### **DTC 72MX / X.25 Network Access card specifications**

- Up to 32 local HP 3000/900 hosts supported per DTC 72MX/X.25 Network Access card.
- Up to three DTC 72MX/X.25 Network Access cards supported per DTC 72MX.

- 
- Each X.25 Network Access card able to support up to 256 Switched or Permanent Virtual Circuits (VC):
    - 256 VCs (packet size up to 512 bytes).
    - 150 VCs (packet size up to 1024 bytes).
    - 100 VCs (packet size up to 2048 bytes).
    - 54 VCs (packet size up to 4096 bytes).
  - CCITT 1980 and 1984 compliance for X.25, X.3, X.28 and X.29 protocols.
  - Compliance with standard Defense Data Network (DDN) specifications.
  - Acceptance of all CCITT 1984 X.25 user and DTE facilities for host-to-host connections for processing at the X.25/iX level.
  - Closed User Groups (CCITT 1980) supported with PAD access.
  - X.25 physical interfaces:
    - RS232C (line speed up to 19.2 kb/s)
    - V.35 (line speed up to 64 kb/s)
  - X.25 LAP-B level 2 parameters:
    - Modulo 8 or 128 frame sequence numbering.
    - Window sizes: 1-7.
    - Frame sizes: as required by Level 3.
  - X.25 level 3 parameters:
    - Modulo 8 sequence numbering.
    - Window sizes: 1-7.
    - Throughput classes: 7-12 (speed up to 64kb/s).
    - D-bit and Q-bit.
    - Switched Virtual Circuit.
    - Permanent Virtual Circuit. PVC is only supported for customer-designed applications using direct X.25 packet level 3
  - programmatic access. (Remote PAD to Host connection is not supported over PVC)
    - Packet sizes: 32 - 4096.
  - PAD functionalities:
    - Supported packet sizes: 128, 256 and 512.
    - PAD support for HP 3000/900 connected to the same LAN as the DTC.
    - PAD support for HP 3000 MPEV, HP 9000 and non-HP systems through DTC extended switching and Telnet-TCP/IP protocol.
    - PAD printers are only supported for system access via a LAN (no back-to-back)
    - Only character mode and VPlus block mode applications are supported with PAD functionality.
    - Multisession is not available for remote PAD users.
- DTC 16 / X.25 Network Access card specifications**
- Up to 32 local HP 3000/900 hosts supported per DTC 16/X.25 Network Access card.
  - One DTC 16/X.25 Network Access card supported per DTC 16.
  - Each X.25 Network Access card able to support up to 32 Switched or Permanent Virtual Circuits (VC).
  - CCITT 1980 and 1984 compliance for X.25, X.3, X.28 and X.29 protocols.
  - Compliance with standard Defense Data Network (DDN) specifications.
  - Acceptance of all CCITT 1984 X.25 user and DTE facilities for host-to-host connections for processing at the NSX.25/iX level.
  - Closed User Groups (CCITT 1980) supported with PAD access.
  - X.25 physical interface:
    - RS-232C (line speed up to 19.2 kb/s)
  - X.25 LAP-B level 2 parameters:
    - Modulo 8 or 128 frame sequence numbering.
    - Window sizes: 1-7.
    - Frame sizes: as required by Level 3.
  - X.25 level 3 parameters:
    - Modulo 8 sequence numbering.
    - Window sizes: 1-7.
    - Throughput classes: 7-10 (speed up to 19.2 kb/s).
    - D-bit and Q-bit.
    - Switched Virtual Circuit.
    - Permanent Virtual Circuit. PVC is only supported for customer
    - Designed applications using direct X.25 packet level 3 programmatic access. (Remote PAD to Host connection is not supported over PVC)
    - Packet sizes: 32-4096.
  - PAD functionalities:
    - Supported packet sizes: 128, 256, and 512.
    - PAD support for HP 3000/900 connected to the same LAN as the DTC.
    - PAD support for HP 3000 MPEV, HP 9000 and non-HP systems through DTC extended switching and Telnet-TCP/IP protocol.
    - PAD printers are only supported for system access via a LAN (no back-to-back)

- Only character mode and VPlus block mode applications are supported with PAD functionality.
- Multisession is not available for remote PAD users.

### X.25 / iX System Access specifications

- Supports Defense Advanced Research Projects Agency (DARPA) standard Transmission Control Protocol / Internet Protocol (TCP/IP).
- Supports up to 11 Network Interfaces per HP 3000/900 host.
- Supports up to 11 DTC/X.25 Network Access cards per NI.
- Can reach up to 1024 remote HP or non-HP computers.
- Implements NetIPC and Berkeley Sockets for TCP and X.25 programmatic access.
- Multiplexes TCP/IP traffic over one X.25 virtual circuit.
- Supports NS/3000 iX Network Services (HP 36920A) for HP 3000 to HP 3000 communication.
- Supports ARPA FTP service (HP 36957A) for HP 3000/900 to HP or non-HP system communication.
- Supports OTS transport and FTAM service (HP 36971A & HP 36972A) for HP 3000/900 to HP or non-HP system communication.
- Supports SNA/X.25 link/iX (HP 30298A) for SNA connectivity between HP 3000/900 to IBM systems over X.25 link.
- Includes NetTool, a set of tools to monitor, analyse and diagnose the transport layer software.

### DTC X.25 management specifications

| X.25 management product                   | NMMGR utility       | HP Openview DTC Manager             |
|---|---------------------|-------------------------------------|
| Platform                                  | HP 3000/900 systems | PCs                                 |
| User Interface                            | ASCII (Vplus)       | Graphical (OpenView (& MS-Windows)) |
| <b>Configuration management</b>           |                     |                                     |
| Configuration X.25 levels 2 - 3           | yes                 | yes                                 |
| Configuration X.25 system switching       | no                  | yes*                                |
| Configuration X.25 PAD access & security  | yes                 | yes*                                |
| Start/Stop X.25 card (& upload databases) | yes                 | yes                                 |
| X.25/Padsup autorestart                   | yes                 | yes                                 |
| X.25/Padsup profiles                      | yes                 | yes                                 |
| <b>Fault management</b>                   |                     |                                     |
| Reset X.25 card and X.25 LCI              | yes                 | yes                                 |
| Upload X.25                               | yes                 | yes                                 |
| Self Test X.25 card and Loopback          | yes                 | yes                                 |
| X.25 tracing & logging                    | yes                 | yes                                 |
| X.25 site management                      | no                  | yes                                 |

\* Indicates parameters can be modified online

### Supported Essential Facilities

|  | 1984 CCITT X.25 Reference |
|--|---------------------------|
| - Extended packet sequence numbering       | 6.2                       |
| - Incoming calls barred                    | 6.5                       |
| - Outgoing calls barred                    | 6.6                       |
| - Non-standard default packet size         | 6.9                       |
| - Non-standard default window size         | 6.10                      |
| - Flow control parameter negotiation       | 6.12                      |
| - Throughput class negotiation             | 6.13                      |
| - Closed User Group selection (1980 CCITT) | 6.14                      |
| - Fast select request and acceptance       | 6.16/6.17                 |
| - Reverse charging and acceptance          | 6.18/6.19                 |
| - Local charging prevention                | 6.20                      |
| - Hunt group                               | 6.25                      |

### Support Facilities with X.25 Level 3 Programmatic Access

|   |           |
|---|-----------|
| - Closed User Group related facilities      | 6.14      |
| - Bilateral closed user groups              | 6.15      |
| - Network user identification               | 6.21      |
| - Chargin information                       | 6.22      |
| - Called line modified address notification | 6.26      |
| - Call redirection and notification         | 6.25/6.27 |
| - Transit delay selection and indication    | 6.28      |

Note: X.25 protocol implementation is provided by DTC/X.25 Network Access.

---

## Ordering Information

### Ordering the DTC X.25 Network Access Card

For DTC 16

**2340A opt. 310** When ordered with a DTC 16

**2343D** When ordered as add-on card

For DTC 72MX

**J2070A opt. 1CW X.25**

Network Access with RS232C interface when ordered with a DTC 72MX

**J2079A opt. 1CW X.25**

Network Access with RS232C interface when ordered as add-on card

**J2070A opt. 1CX X.25**

Network Access with V.35 interface when ordered with a DTC 72MX

**J2079A opt. 1CX X.25**

Network Access with V.35 interface when ordered as add-on card

### Ordering the DTC X.25 Management

#### DTC manager running on an HP 3000/900:

Nothing to order

Integrated with the MPE/iX operating system (FOS)

#### DTC manager running on the HP OpenView Windows platform:

##### HP 32054D opt. 201

HP OpenView Windows Workstation (PC)

preconfigured with the DTC Manager

application software

#**ABA** --> #**ABZ** Localization options (must order one)

Network connection options (must order one)

**101** ThinLAN connection

**102** ThickLAN connection

**103** Ethertwist connection

**D2355A** DTC manager application software for an HP OpenView Windows (PC) workstation

**D1824D** opt. 201 Update of an existing HP OpenView Windows Workstation with the latest revision of software and DTC manager application

- The HP OpenView Windows workstation (HP 32054D) is an especially configured HP Vectra, with PC software already installed. It includes 2Mb of additional memory, HP thinkjet printer, and MS-DOS, MS-Windows, HP ARPA & Network Services /DOS, HP OpenView Windows, HP AdvanceLink for Windows

#### Ordering the X.25/iX System Access

**36939A** X.25/ iX System Access

Right to use license option ( must order one)

**0AF** 20 Users License

**UCY** 40 Users License

**UA9** 64 Users License

**UBD** 100 Users License

**UCN** 160 Users License

**UAT** Unlimited Users License

#### Upgrade Credit options:

Use one of the following options when 36939A has been initially ordered with Users License option:

**UD8** Credit for 20 Users license

**UCZ** Credit for 40 Users license

**UB9** Credit for 64 Users license

**UDV** Credit for 100 Users license

**UBP** Credit for 160 Users license

For installed base, use one of the following options when 36939A has been initially ordered with Processor option:

**0CD** Credit for processor option 310

**0GJ** Credit for processor option 315

**0CE** Credit for processor option 320

**0CF** Credit for processor option 330

**0GL** Credit for processor option 335

**0GM** Credit for processor option 340

**UEK** Credit for processor option 350

*Note 1:* For system to system communication, this product must be ordered in addition to X.25 Network Access card. 36939A is not required if only X.25 PAD support functionality is needed.

*Note 2:* In order to receive the upgrade credit, customers must select, on the same order, the upgrade credit option that pertains to their current user license option in addition to the new user license option.

## Certified X.25 Packet Switched Networks

The following public Packet Switched Networks (PSNs) have certified the X.25 iX Network Link. This list is current as of February 1993. Please consult your HP Sales Representative for an updated list of certified PSNs.

| Country        | Network  |
|----------------|----------|
| Austria        | Datex-P  |
| Belgium        | DCS      |
| Brazil         | Renpac*  |
| Finland        | Datapak  |
| France         | Transpac |
| Germany        | Datex-P  |
| Hong Kong      | Intelpak |
| Italy          | Itapac   |
| Luxembourg     | Luxpac   |
| Netherlands    | Datanet1 |
| Norway         | Datapak  |
| Spain          | Iberpac* |
| Sweden         | Datapak  |
| Switzerland    | Telepac  |
| United Kingdom | PSS*     |
| U.S.A          | Telenet  |
| U.S.A          | Tymnet   |
| U.S.A          | DDN      |

\* in process

## Recommended Networking devices

The following devices are fully

certified and tested for operation with the X.25/ iX Network link. Both devices can also be managed from the DTC management Openview workstation with the HP Openview SwitchPad Manager application.

- HP Model 45 Plus: X.25 Multi-protocol switch. This product features traffic concentration in multilinks and multiprotocol environments (SNA, X.25 and Async).
- HP 2335A: X.25 PAD/Statistical multiplexer. This product allows connection of remote asynchronous terminals and printers to a central computer via an X.25 link.

For detailed information on these products, refer to the individual product datasheets.

## X.25 / iX Network Link documentation

Included with X.25 iX System Access product (36939A):

**36939-90001** X.25 iX system access configuration guide  
**5958-8600** NetIPC 3000/iX Programmer's guide Reference Manual

Additional orderable manuals:  
**36923-61001** Guide to NS3000/iX documentation

**36922-90007** NS3000/iX configuration, planning and design guide

**36922-90010** NS3000/iX

operations and Maintenance reference manuals  
**32022-61005** Using the Node Management services utilities  
**36922-90008** NS3000/iX Screen reference manual  
**5959-2836** NS3000/iX Error Message reference manual

## Installation and Configuration Support Policy

The customer is responsible for loading the X.25 iX Network Link onto the system. Hewlett-Packard will provide installation of the Datacommunications and Terminal Controller (DTC), the DTC/X.25 Network Access cards and the HP OpenView DTC Manager (if PC-Based Network Management) and will perform minimum configuration of X.25 iX Network Link in order to verify minimum functionality. These activities are included in the product purchase price. For product configuration tailored to the customer's specific needs, or for a complete HP implementation, HP offers a comprehensive range of integrated and flexible support services. Please refer to the Network Support data sheets for more information on these services.

---

### **Pre-Installation Customer Responsibility**

The customer is responsible for the following:

- Providing HP with the information necessary to complete the Network Implementation and Support Plan (NISP), including: system configurations, logical network map identifying relevant traffic flow and physical network map identifying relevant network hardware components.
- Installing and verifying the communications line between the DTC and the X.25 network.
- Completing all tasks related to the DTC TIO installation.
- When necessary, subscribing to the appropriate administration for access to the public PSN.
- Updating the HP 3000 system to the proper release level and installing the X.25 iX Network Link system software using AUTOINST, if HP 36939A X.25 iX System Access is purchased. Refer to the HP 3000 MPE iX Installation and Update Manual.
- Verifying that all of the necessary software modules have been successfully installed.
- Performing a full system backups.

### **HP Responsibility**

Following the installation of the X.25 iX System Access (HP 36939A) software, if purchased, HP is responsible for performing the following tasks for the various components of the X.25 iX Network Link. To install the DTC, HP is responsible for the following:

- Attaching the communication line from the X.25 network to the DTC/X.25 Network Access card.
- Configuring the DTC/X.25 Network Access card via the OpenView DTC Manager or NMMGR.
- Verifying that the DTC/Network Access card properly operates.

To install Add-on DTC/X.25 Network Access cards, HP is responsible for the following:

- Inserting the Add-on card in the DTC and performing the self-test.
- Attaching the communication line from the X.25 network to the Add-on card.
- Configuring the DTC/X.25 Network Access card via the OpenView DTC Manager or NMMGR.
- Verifying that the DTC/Network Access card properly operates.

To install the HP 36939A X.25 iX System Access for system-to-system communication, HP is responsible for the following:

- Confirming that all the necessary software modules for the X.25 iX System Access software have been installed and are at the correct version level.
- Configuring the X.25 link on the HP 3000 using the customer supplied values and cross-validating the DTC-related configuration with the system configuration.
- Verifying the X.25 Link between the HP 3000 and the X.25 network properly operates.

### **Post-Installation Customer Responsibility**

After HP has completed its installation responsibilities, the customer is responsible for fully integrating the new installation to the existing customer network.

### **Product requirements**

Refer to HPSL database for the supported DTC & Operating System releases.