



TURBOWAYS 25 ATM PCI Adapter Installation and User's Guide

First Edition (April 1997)

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Safety Information

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

Handling Static Sensitive Devices

Attention: Static electricity can damage this device and your system unit. To avoid damage, keep this device in its static protective bag until you are ready to install it. To reduce the possibility of electrostatic discharge, follow the precautions listed below:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it on its static-protective package. (If your device is an adapter, place it component-side up.) Do not place the device on your system unit cover or on a metal table.
- Take additional care when handling devices during cold weather, as heating reduces indoor humidity and increases static electricity.

About This Book

This book describes the TURBOWAYS 25 ATM PCI Adapter and its various features.

Use this information, with your system unit documentation, to help install the TURBOWAYS 25 ATM PCI Adapter and associated device driver software.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

This book refers to the documentation that came with your system unit.

Trademarks

AIX is a registered trademark of International Business Machines Corporation.

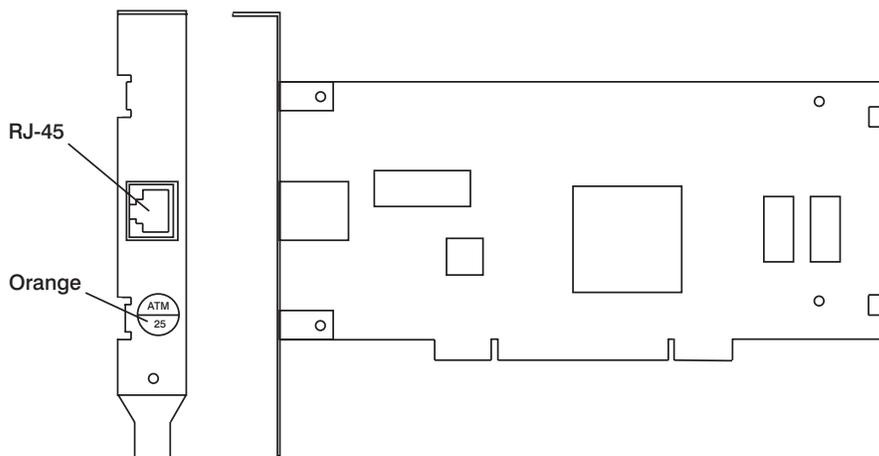
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Chapter 1. Overview

This document is written for system administrators and for experienced computer users who have a general understanding of asynchronous transfer mode (ATM), networking, and AIX Version 4.1.5.

Document Overview

The document provides instructions to install the TURBOWAYS 25 ATM PCI Adapter with AIX and with ATM25 software. Instructions include directions to configure the TURBOWAYS 25 ATM PCI Adapter.



TURBOWAYS 25 ATM PCI Adapter

Note: Instruction assumes you are running AIX and connecting TURBOWAYS 25 ATM PCI Adapter on AIX to an ATM switch or concentrator.

How to Use This Document

To begin, read “How to Use This Document” for an overview of the document. Follow the instructions in Chapter 2, “Installing the ATM25 Software and the TURBOWAYS 25 ATM PCI Adapter” on page 2-1, to install the ATM25 software and to install and connect the TURBOWAYS 25 ATM PCI Adapter.

Go to Chapter 3, “Configuring and Using ATM25 Software” on page 3-1, for directions to configure the adapter; to set the hostname, nameserver, and gateway; to configure PVCs, or to remove previously installed ATM25 software.

Chapter 4, "Managing the Network" on page 4-1, assists you in implementing and maintaining your ATM network.

The appendices provide concise and helpful information. If you have any problems installing or configuring your adapter, refer to Appendix A, "Troubleshooting" on page A-1, for problem-solving information. For a discussion of product features and a list of product specifications, see Appendix B, "Product Features and Specifications" on page B-1.

Software Requirements

The TURBOWAYS 25 ATM PCI Adapter is supported on AIX Version 4.1.5. If support is required on an AIX release other than AIX 4.1.5, please ensure this adapter is supported on that release of AIX prior to install. Contact your support representative for assistance.

Chapter 2. Installing the ATM25 Software and the TURBOWAYS 25 ATM PCI Adapter

This chapter explains how to install the TURBOWAYS 25 ATM PCI Adapter with ATM25 software as well as how to connect ATM cables. Before proceeding with these instructions, it is recommended that you read, Chapter 4, "Managing the Network" on page 4-1.

Preparing to Install the ATM25 Software

Insure your system is running AIX 4.1.5. To verify this level, type *oslevel* and press Enter. If your system is running another level, contact your support representative to determine if your level is supported.

Installing the ATM25 Software

This section explains how to install the AIX 4.1.5 ATM common code and the ATM25 software for the TURBOWAYS 25 ATM PCI Adapter.

1. Turn the system unit power on.
2. Log in as **root**.
3. Insert the media containing the AIX 4.1.5 ATM common code device driver software (example: CD-ROM) into the appropriate media device.
4. Type the following:
smitty devinst
and press Enter.
5. The Install Additional Device Software screen highlights the "**INPUT device/directory for software**" option.
6. Select or type *your input device*:
 - Press **F4** to display the input device list. Select the *name of the device* (example: CD-ROM) that you are using and press Enter.
-- or --
 - In the Entry Field, type the *name of the input device* you are using and press Enter.
7. The Install Additional Device Software window highlights the **SOFTWARE to install** option.
8. Press **F4** to display the SOFTWARE to install window.

9. Type the following to display the Find window:

/

10. Type the following

`devices.mca.8f7f.com`

and press Enter. (The system finds and highlights this device driver.)

11. Press **PF7** to select the device driver and press Enter.

12. The Install Additional Device Software screen displays. Entry data fields are automatically updated. Press Enter to accept the data.

13. The ARE YOU SURE window displays. Press Enter to accept the data.

14. The **COMMAND STATUS** screen appears.

- The term **RUNNING** is highlighted to indicate that the install and configure command is in progress.
- When **RUNNING** changes to **OK**, scroll down to the bottom of the page and locate the Installation Summary.
- After a successful installation, **SUCCESS** appears in the Result column of the summary at the bottom of the page.

15. Remove the installation media from the drive.

16. Press **F10** to exit SMITTY.

17. Insert your ATM device driver diskette into your diskette drive.

18. At the AIX command prompt, type:

`smitty`

and press Enter.

19. From the System Management menu, select **Software Installation and Maintenance**.

20. From the Software Installation and Maintenance menu, select **Install and Update Software**.

21. From the Install and Update Software menu, select **Install /Update Selectable Software (Custom Install)**.

22. From the Install/Update Selectable Software (Custom Install) menu, select **Install Additional Device Software**.

23. Select or type *your input device*:

- Press **F4** to display the input device list. Select the *name of the device* (example: diskette) that you are using and press Enter.

-- or --

- In the Entry Field, type the *name of the input device* you are using and press Enter.

24. The Install Additional Device Software window highlights the **SOFTWARE to install** option.

25. Press **F4** to display the SOFTWARE to install window.

26. Type the following to display the Find window:

/

27. Type the following

`devices.pci.14105300`

and press Enter. (The system finds and highlights this device driver.)

28. Press **PF7** to select the device driver and press Enter.

29. The Install Additional Device Software screen displays. Entry data fields are automatically updated. Press Enter to accept the data.

30. The ARE YOU SURE window displays. Press Enter to accept the data.

31. The **COMMAND STATUS** screen appears.

- The term RUNNING is highlighted to indicate that the install and configure command is in progress.
- When RUNNING changes to OK, scroll down to the bottom of the page and locate the Installation Summary.
- After a successful installation, SUCCESS will appear in the Result column of the summary at the bottom of the page.

Note: If the Command status changes from running to Failed, the installation is not complete. Review the text on the screen for error messages and determine if any software options were not installed. Follow appropriate instructions on the screen.

If any software options did not install during the first installation, try to install them again. If you are not successful, call your service representative.

32. Remove the installation media from the drive.

33. Press **F10** to exit SMITTY.

34. At the command line, type:

```
shutdown -F
```

and press Enter.

Refer to your operating system user's guide for any specific instructions.

35. Go to "Installing the Adapter."

Installing the Adapter

Be sure you have installed the ATM25 software as explained in Chapter 2, "Installing the ATM25 Software and the TURBOWAYS 25 ATM PCI Adapter" on page 2-1. Refer to your system unit for specific instructions to install your adapter.

Verifying Adapter Available for Use

To verify that your newly installed TURBOWAYS 25 ATM PCI Adapter is available for use, follow the steps below:

1. If necessary, turn your system unit power on.

2. Log in as **root**.

3. At the prompt, type

```
lsdev -Cs adapter | grep atm
```

and press Enter.

4. A list of adapters displays. Verify that the TURBOWAYS 25 ATM PCI Adapter is in Available mode. If your TURBOWAYS 25 ATM PCI Adapter is not available, run the diagnostics utility described in the Diagnostics section of Appendix A, "Troubleshooting" on page A-1.

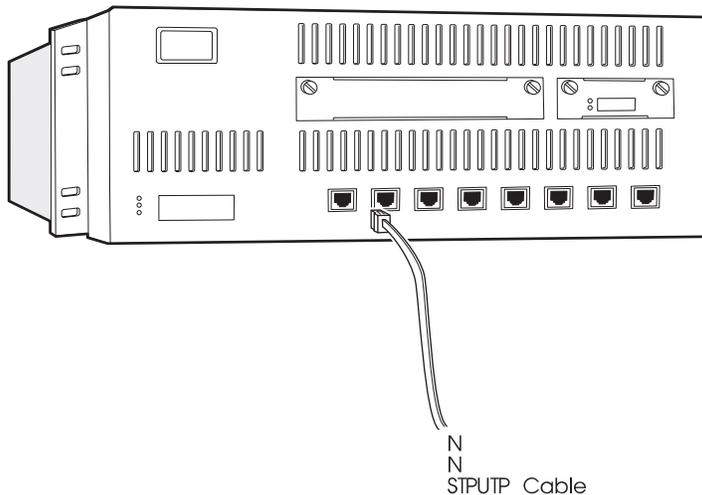
Connecting the TURBOWAYS 25 ATM PCI Adapter to the Network

Before using your TURBOWAYS 25 ATM PCI Adapter, connect it to an ATM switch or concentrator.

Note: The RJ-45 connector pinout on the adapter conforms with the ATM Forum standard. If your switch connector pinout is not compatible with this standard, obtain or create a cable to convert to the required pinout. (See RJ-45 Receptacle Pin Assignment in Appendix B, "Product Features and Specifications" on page B-1, specifically section "RJ-45 Receptacle Pin Assignment" on page B-3 for pinouts.)

To connect the TURBOWAYS 25 ATM PCI Adapter to an ATM switch or concentrator:

- Obtain connecting cable. (See Appendix B, "Product Features and Specifications" on page B-1, specifically section "RJ-45 Receptacle Pin Assignment" on page B-3 for cable pin assignments.)
- Connect one end of the cable to the adapter.
- Connect the other end of the cable to a wall outlet or directly to the ATM switch or concentrator, as in figure below.



Connecting the UTP/STP Cable to an ATM Switch

Chapter 3. Configuring and Using ATM25 Software

This chapter explains how to configure and how to use ATM25 software for AIX. Included are guidelines for implementing an ATM Address Resolution Protocol (ARP) server. Before you perform these instructions, it is advisable to read Chapter 4, "Managing the Network" on page 4-1.

Attention:The TURBOWAYS 25 ATM PCI Adapter supports multiple TCP/IP instances on a single adapter as well as supports multiple adapters within a single system unit. The instructions in this chapter are written for one adapter with one TCP/IP instance. For multiple instances, substitute the desired instance (at0 or at1 or at2 ...). For multiple adapters, substitute the desired adapter (atm0 or atm1 or atm2 ...).

Note: In the remainder of this book, examples assume one adapter and one instance of TCP/IP.

Configuring the Adapter

To configure the TURBOWAYS 25 ATM PCI Adapter:

1. Turn the system unit power on.
2. Log on to the AIX operating system as **root**.
3. At the AIX command prompt, type the following and press Enter.

```
smitty inet
```

Note: The `ifconfig` command is not compatible with the ATM Network Interface Driver (NID). Use only the SMITTY application when configuring the ATM NID.

4. From the Network Interface Selection menu, select **Add a Network Interface**.
5. From the Add a Network Interface menu, select **Add an ATM Network Interface**.
6. Set the values in the Add an ATM Network Interface screen via instructions below:
 - INTERNET ADDRESS
 - Type the dotted decimal Internet Protocol (IP) address assigned to your workstation (for example, 10.125.26.89) and press Enter.

- Network MASK
 - Type the dotted decimal IP network mask for your workstation (for example, 255.255.255.0) and press Enter.
 - Note:** To get the addresses, see your system administrator.
- Network Interface
 - Type at0 and press Enter.
- Connection Type

Press **F4** and select one of the following types:

svc_s Switched Virtual Channel (SVC) ARP Server

svc_c SVC ATM Client

pvc SVCs disabled (only permanent virtual channels, PVCs, are used)
- ATM Server Address
 - For client connections **svc_c**, type the 20-byte hexadecimal ARP server ATM address for your system unit and press Enter. (For example, 39.99.99.99.99.99.00.00.99.99.02.02.0 0.00.8d.44.a3.02.03).
 - To obtain your ATM server address, type the following on the ARP server machine at the command prompt and press Enter.


```
arp -t atm -a
```
 - For server connections **svc_s**, no address is required. Leave this field blank.
- Alternate Devices
 - Data not required; leave field blank.
- Idle Timer
 - Data not required; leave field blank.
- ACTIVATE the Interface after Creating it?
 - To activate the interface, select the default, **yes**.

7. When the Command status in the Command Status screen changes from running to OK, press **F10** to exit SMITTY.

To set the hostname, a nameserver, or a gateway; continue with the next section.

To use permanent virtual channels (PVCs), go to “Configuring PVCs” on page 3-3.

Setting the Hostname, Nameserver, or Gateway

To set the hostname, nameserver, or gateway:

1. At the AIX command prompt, type:
`smitty tcpip`
and press Enter.
2. From the TCP/IP menu, select **Minimum Configuration & Startup**.
3. From the list of Available Network Interfaces, select **at0**.
4. The Minimum Configuration & Startup panel appears.
5. Type the information for the hostname, nameserver, or gateway in the Minimum Configuration & Startup panel and press Enter.
Note: See your system administrator for the required addresses.
6. When the Command status in the Command Status screen changes from running to OK, exit SMITTY.
7. To exit SMITTY, press **F10**.

Configuring PVCs

Note: The TURBOWAYS 25 ATM PCI Adapter can be configured to use PVCs with or without configuring SVCs.

To configure the TURBOWAYS 25 ATM PCI Adapter to use PVCs:

1. At the AIX command prompt, type:
`smitty atmpvc`
and press Enter.
2. To add PVCs for internet protocol (IP) on an ATM Network, select **Add a PVC for IP over an ATM Network**.

3. If you desire to change a value in the Add a PVC for IP over an ATM Network screen, find the appropriate instruction below and implement the relevant steps:

- PVC Description
 - The PVC Description is an optional field.
- VPI:VCI
 - Type the following, where x equals a number from 0 to 1023.
0:x
and press Enter.
Note: The virtual path identifier (VPI) must be 0. The valid range for the virtual channel identifier (VCI) is determined by the number of virtual channels (VCs) supported by the switch and the number of VCs reserved for PVC connection.
- Network Interface
 - Type at0 and press Enter.
- Destination IP Address
 - If you set the Automatically Discover Destination IP Address field to no, type the dotted decimal IP address (for example, 162.62.41.96) of the destination end station (ATM-attached host or gateway) and press Enter.
- Automatically Discover Destination IP Address
 - Select **yes** or **no** and press Enter.
- LLC Encapsulation
 - LLC Encapsulation determines whether Logical Link Control/Subnetwork Access Protocol (LLC/SNAP) or null encapsulation is used on the PVC. Select **yes** or **no** and press Enter.

4. When the Command status in the Command Status screen changes from running to OK, press **F3**.

5. SMITTY returns you to the PVCs for IP over an ATM Network screen.

6. To verify that the configuration is correct, select **List All PVCs for IP Over an ATM Network**.

7. When the Command status in the Command Status screen changes from running to OK, press **F3**.

8. SMITTY returns you to the PVCs for IP over an ATM Network menu.

9. If you need to make changes, continue with the next step; otherwise, press **F10** to exit SMITTY.

10. From the PVCs for IP over an ATM Network menu, select **Change / Show Characteristics of a PVC for IP over an ATM Network**.
11. From the list of Available Interfaces, select **at0**.
12. If necessary, change values in the Change / Show Characteristics of a PVC for IP over an ATM Network screen and press Enter.
13. When the Command status in the Command Status screen changes from running to OK, press **F10** to exit SMITTY.

Installation Removal Procedure

To remove the ATM25 software:

1. Log on to the AIX operating system as **root**.
2. At the AIX command prompt, type:
`smitty inet`
and press Enter.
3. From the Network Interface Selection menu, select **Remove a Network Interface**.
4. From the Available Network Interfaces list, select **at0**.
5. When the Command status in the Command Status screen changes from running to OK, press **F10** to exit SMITTY.
6. At the AIX command prompt, type:
`smitty atm_adpt`
and press Enter.
7. From the Adapter menu, select **Remove an ATM Adapter**.
8. From the ATM Adapter list, select **at0**.
9. When removal is complete and the Command status changes from running to OK, press **F10** to exit SMITTY.

10. At the AIX command prompt, type:
 `smitty install`
 and press Enter.
11. From the Software Installation and Maintenance menu, select **Maintain Installed Software**.
12. From the Maintain Installed Software menu, select **Remove Software Products**.
13. In the Remove Software Products panel:
 - Type the SOFTWARE name, `devices.pci.14105300`
 - To PREVIEW only, select **no**.
 - To REMOVE dependent software, select **yes**.
 - For DETAILED output? Select **yes** or **no**.
14. The ARE YOU SURE? panel appears:
 - To continue to remove the software, press Enter.
 - To cancel the uninstallation process, press **F3**.
15. When removal is complete and the Command status in the Command Status screen changes from `running` to `OK`, press **F10** to exit SMITTY.

Chapter 4. Managing the Network

This chapter provides information to assist in creating and maintaining ATM networks.

ATM Connections

ATM networks use a virtual path identifier (VPI) and a virtual channel identifier (VCI). VPI and VCI together identify connections in the ATM network. A VPI:VCI pair defines a path between two nodes in an ATM network. The VPI field occupies 1 byte in the ATM cell's 5-byte header while the VCI field occupies 2 bytes in the ATM cell's 5-byte header.

For the TURBOWAYS 25 ATM PCI Adapter, the value of VPI must be 0. VCI can be between 0 and 1023 decimal.

Although not required, VPI:VCI values are typically assigned symmetrically, that is, the same values are reserved in both directions across the link. A link is the physical medium of transmission, for example, a telephone wire or microwave beam. A link connection includes the physical medium for transmission, the protocol, associated devices and programming. A link connection is both logical and physical.

More than one virtual channel (VC) can be set up on the same link, but the VPI:VCI must be different for each connection on the link. A permanent virtual channel (PVC) is a static connection between two end stations and the ATM network. The PVC is created by selecting a physical path from the end station through the switches to the other end station. VPI:VCIs are assigned to establish the connection between the two end stations. The PVC must be configured in each end station and in all switches included in the connection.

An ATM switch performs the following functions automatically:

- Recognizes the source of the cell.
- Changes VPI:VCI.
- Determines the destination of the cell.
- Transmits the cell to its destination.

TCP/IP over ATM

Each ATM network interface can have an assigned IP (internet protocol) address. This assigned network interface can have VPI:VCIs associated with it. This allows a TCP/IP host, identified by its IP address, to communicate with multiple TCP/IP (transmission control protocol/internet protocol) hosts on the ATM network.

If your host has more than one IP address, (for example, one ATM interface and one Token-Ring interface), you must add one network interface for each IP address. The TURBOWAYS 25 ATM PCI Adapter supports multiple network interfaces.

Configuring with PVCs

PVCs in ATM-attached hosts, gateways, and switches must be configured by users. For environments requiring the transfer of several protocols over the same VCI or support for inverse ARP (address resolution protocol) requests, LLC (logical link control) encapsulation is provided. If LLC support is enabled, the system issues inverse ARP requests on the VPI:VCI connection to automatically discover the destination's IP address. This request is issued every minute until the destination IP address is found. Once the destination IP address is found, inverse ARP requests are issued every 15 minutes to verify that the connection has not changed. If automatic destination address discovery by inverse ARP is either declined or not supported at the destination, the destination IP address must be specified.

Note: The TURBOWAYS 25 ATM PCI Adapter automatically examines data received to determine whether encapsulation is used. The encapsulation configuration parameter is not observed when receiving data, but the configuration parameter does control whether data is transmitted with or without encapsulation.

Networking with ATM SVCs

Networking with ATM SVCs (switched virtual circuits) is different from networking with ATM PVCs. PVCs are created by users during configuration of ATM-attached hosts, gateways, and switches. These static connections remain established until they are removed by configuration changes. To establish complete connectivity, a connection must be configured and maintained from each node to every other node. This process can become labor intensive as the number of connections grows rapidly with the addition of nodes. Such complexity is avoided by using SVCs. An IP subnet using SVCs consists of an ATM switch, an ARP server, and ARP clients. During network initialization, endpoints automatically open signaling channels to obtain their 20-byte ATM address from the switch. Using the ARP server ATM address provided by the user at the time of configuration, clients open a connection with the subnet's ARP server and register both their IP and ATM addresses.

Note: Each subnet requires one ATM ARP server. When a client station needs to transmit to another station, the ARP server is called. If the destination's IP address is registered with the server, the destination's ATM address is resolved. The caller now has the destination ATM address and requests a connection to that station through the ATM switch. The switch creates a VPI:VCI connection from the caller to the destination.

Changing ATM Adapter Characteristics

The TURBOWAYS 25 ATM PCI Adapter characteristics are automatically set during system boot, and these settings provide good performance. If you are an experienced user and wish to change the adapter characteristics, follow these instructions:

To change the default ATM adapter characteristics:

1. At the AIX command prompt, type:

```
smitty atm_adpt
```

and press Enter.
2. From the Adapter menu, select **Change / Show Characteristics of an ATM Adapter**.
3. From the ATM Adapter list, select **atm0**.
4. Change any values in the Change / Show Characteristics of an ATM Adapter screen and press Enter.
 - Device name
 - atm0 (read-only)
 - Description
 - IBM PCI 25MBPS ATM Adapter
 - Status
 - Defined (read-only)
 - Location
 - 00-01 (read-only)

- Enable ALTERNATE ATM MAC address
 - Set this characteristic to **yes** to enable the ATM media access control (MAC) address you specify in the ALTERNATE ATM MAC address field.

Note: Alternate MAC Address: To facilitate an easy swap of ARP servers and/or server adapters, the option of a user-specified alternate MAC address is provided. Since an endpoint's ATM address is partially derived from the adapter's MAC address, changing an adapter in an endpoint changes that station's ATM address.
- ALTERNATE ATM MAC address
 - Type the MAC address in hexadecimal format (example: 0x0000D10008ED).

If an ARP server adapter is changed, it is not necessary to change the ARP server ATM address in each ARP client. The MAC address of the previous configuration can be entered as the alternate MAC address of the new adapter. Each MAC addresses within a network, however, must be unique.
- Minimum guaranteed VC support
 - User anticipates minimum virtual connections ranging from 1 to 128.
- Maximum number of VCs required
 - User anticipates maximum virtual connections ranging from 1 to 128.
- Minimum pre-allocated transmit descriptors
 - Minimum number of transmit requests the device driver handles range from 16 to 128 in increments of 16.
- Minimum 4K pre-mapped receive buffer
 - Minimum number (receive buffer) required to handle incoming traffic ranges from 16 to 256 in increments of 16.
- User high-priority PVCs Peak Rate (kbps)
 - User specified peak rate for a PVC is specified in kbps. Valid range runs from 100 to 25600 in increments of 100 kbps.

Note: This value specifies the bandwidth required to allocate each of the user's high priority PVCs. Setting this value too high may prevent some virtual circuit from establishing a connection.
- Enable OAM F4 Flow Control
 - Set this characteristic to **yes** to enable the device to send a OAM F4 Flow Control cell once every second to the ATM switch.

5. When the Command status in the Command Status screen changes from running to OK, press **F3**.
6. To exit SMITTY, press **F10**.

Appendix A. Troubleshooting

If your TURBOWAYS 25 ATM PCI Adapter is not functioning properly:

1. Run one of the diagnostics utilities outlined in this Appendix.
2. Attempt to resolve problem using the Troubleshooting steps below.
3. Contact your service representative.

Diagnostics

To run the TURBOWAYS 25 ATM PCI Adapter diagnostics utility:

1. Start AIX, and log in as **root**.
2. To run the diagnostic utility, at the AIX command prompt, type the following and press Enter.

```
diag -d atm0
```
3. From the DIAGNOSTIC MODE VERIFICATION screen, select **System Verification** and press Enter.
4. Follow the directions on the screen.

Supplemental Diagnostics

The diagnostics utility is used to verify that your adapter is functioning properly. Before you begin, insure diagnostics is installed on your system unit.

To run the utility:

1. Set your system unit to Service mode. Go to your system unit User's Guide for instruction. Return here.
2. Insert the diagnostics media and turn the system unit power on.
3. Follow the instructions on the screen, press Enter.
4. From the Functional Selection Menu, select **Service Aids**.
5. Select **Display or Change Configuration or Vital Product Data (VPD)** from the Service Aids Menu.
6. Select **Yes** to install TURBOWAYS 25 ATM PCI Adapter Supplemental Diagnostics.
7. Insert TURBOWAYS 25 ATM PCI Adapter supplemental diagnostics diskette into the diskette drive.
8. Press Enter.
9. After installing diagnostics, select **No** to exit the Service Aids selection panel.
10. Select **F10** to exit Display or Change Configuration or Virtual Product Data service aid panel.
11. Select **F10** to exit Service Aids selection panel.
12. Select **Advanced Diagnostic Routines** on the Function Selection menu.
13. If all other features are correct, select **1 Continue**.
14. Select **System Verification** on the Advanced Diagnostics Selection menu.
15. Select **Read Supplemental Diskette**.
16. Insert the supplemental diagnostics diskette and press Enter.
17. Select **Advanced Diagnostic Routines** on the Function Selection menu.
18. Select **1 Continue**.
19. Select **System Verification** on the DIAGNOSTIC MODE SELECTION menu.
20. Select **atm0**. (The tests may take several minutes to run.)
21. Diagnostics are complete. A message tells you if your adapter is available for use or is failing.

SMS Diagnostic Instructions for the TURBOWAYS 25 ATM PCI Adapter

If your system utilizes System Management Services (SMS), use the procedure in this section to verify the adapter is installed correctly. (See your system unit User's Guide for additional SMS information.)

The SMS Diagnostic Program can be found on the DOS-formatted diskette included with your TURBOWAYS 25 ATM PCI Adapter.

Testing the Adapter using SMS

1. Shut down your system. (Refer to your system unit User's Guide for instructions.)
2. Insert your working copy of the SMS diskette.
3. Determine the type of monitor you are using (below) before you turn on your system unit. Follow the instruction for your monitor type.
 - If you have a graphics monitor, a graphics icon will appear when you turn on your system unit. After that icon appears (but before an audible tone sounds), press **PF4**.
 - If you have a TTY monitor, a message appears when you turn on your system unit. After that message appears (but before an audible tone sounds), press **PF4**.
4. The SMS main menu appears. (If the SMS main menu does not appear, you may have waited too long to press the PF key. Turn your system unit off and retry the above procedure.)
5. From the main menu, select **utilities**.
6. From the System Management Utilities panel, select **Copy Diagnostic Files (Selection #10)**.
7. Insert the SMS Diagnostic diskette for the TURBOWAYS 25 ATM PCI Adapter into your diskette drive.
8. Press Enter.
9. After utility is copied, select **esc** to return to the main menu.
10. From the SMS main menu, select **Test the Computer**.
11. Use your arrow keys to select **Test ATM25**
12. Press your Spacebar.

13. Press **PF4** to view or change test parameters.

- Select the parameters you desire such as **Run Interactive Tests** and **Stop on Error**.
- Select **Run Wrap Tests** only if you have a wrap plug.

14. Press **PF6** to execute your test. (Wrap tests will prompt you to install a wrap plug.)

15. When tests are complete, remove the SMS diagnostics diskette.

16. Restart your system unit.

Note: If a diagnostic test fails, contact your service representative.

Troubleshooting

If diagnostics pass and your TURBOWAYS 25 ATM PCI Adapter is not functioning:

1. Refer to your system unit documentation to disconnect power cables and remove the system unit cover.
2. Remove and reseal the adapter.
3. Install the TURBOWAYS 25 ATM PCI Adapter in a different slot if one is available.
4. After completing these steps, refer to your system unit documentation to reassemble your system unit and connect the power cord.
5. Reread the software instructions. Be sure software settings are correct.
6. If your TURBOWAYS 25 ATM PCI Adapter still does not function, call your service representative.

Appendix B. Product Features and Specifications

Following is an overview of the TURBOWAYS 25 ATM PCI Adapter features and a list of product specifications.

Features

The TURBOWAYS 25 ATM PCI Adapter for AIX provides direct access to ATM networks. The TURBOWAYS 25 ATM PCI Adapter provides dedicated 25 Mbit/sec full-duplex connection using PVCs or SVCs and enables TCP/IP to run over an ATM network. The adapter also supports communication with devices located on an ATM network or bridged to a Token Ring, Ethernet, or other LAN. The following list summarizes the features of the TURBOWAYS 25 ATM PCI Adapter:

- 32-bit bus master DMA
- Support for 32-bit data streaming
- Dedicated 25 Mbit/sec full-duplex connection
- TCP/IP support
- SVC and PVC support
- Ease of installation and setup through a graphical user interface
- ATM adaptation layer (AAL) 5 support
- Advanced Interactive Executive (AIX) 4.1.5 device driver
- Diagnostic supports both SMS and AIX diagnostics
- ATM user network interface (UNI 3.0) featuring
 - Scalability for present and future network requirements
 - Bandwidth on demand
 - Aggregation of voice, data, and video traffic into one transmission scheme

Specifications

The adapter complies with applicable ATM Forum specifications and with PCI bus specifications.

Environment

Power dissipation	Maximum 1 Watt or 0.18 amp at 5 V DC
Power VCC	4.75 to 5.25 V
Operating temperature	10 to 40 °C
Humidity	8 to 80% noncondensing

PCI Interface

Size	6.2" x 3.0" single-slot adapter
Bus master	32-bit bus master capability

UTP/STP Interface

Connector	RJ-45
Operating distance	100 m
Cable specification	EIA/TIA 568
STP	150 ohm
UTP 3, 4, 5	100 ohm
Data rate	25.6 Mbits/sec
Line code	NRZI

Note: UTP/STP: unshielded twisted pair / shielded twisted pair.

RJ-45 Receptacle Pin Assignment: The RJ-45 receptacle pin assignment on the ATM adapter and the ATM switch or concentrator are listed in the following table:

Table B-1. ATM Forum Standard

Pin Contact	ATM Cable/ Adapter Signal	ATM Network/ Switch Signal
1	Transmit A	Receive A
2	Transmit B	Receive B
3	Unused	Unused
4	Unused	Unused
5	Unused	Unused
6	Unused	Unused
7	Receive A	Transmit A
8	Receive B	Transmit B

Wrap Plug: A wrap plug is supplied with the following wiring connections:

- Pin 1 to pin 7
- Pin 2 to pin 8
- Pin 3 to pin 4
- Pin 5 to pin 6

Appendix C. Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

Note: The TURBOWAYS 25 ATM PCI Adapter has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, New York 10504
Telephone: (919) 543-2193



Tested to Comply
With FCC Standards

FOR HOME OR OFFICE USE

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to

maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Canadian Department of Communications Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づきクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.



Part Number: 93H5685



Printed in the United States of America
on recycled paper containing 10%
recovered post-consumer fiber.

93H5685

