

**TURBOWAYS 155 PCI MMF ATM 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.**



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## Handling the Adapter

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

### Electrostatic Discharge Protection

To prevent electrostatic discharge:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the adapter carefully; hold it by its edges.
- Do not touch any exposed printed circuitry.
- Prevent others from touching the components or the adapter card.
- During installation, touch the static-protective package containing the adapter to a metal expansion-slot screw or other unpainted metal surface on the computer for at least 2 seconds. (This drains static electricity from the package and from your body.)
- When possible, remove the adapter and install it directly into the computer without setting it down. Otherwise, place the adapter (component side up) on the static-protective bag on a flat surface until the adapter card is installed.
- Do not place the adapter on the computer cover or on a metal table.



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## About This Book

This book describes the TURBOWAYS 155 PCI MMF ATM Adapter and its various features.

Use this information, with your system unit documentation, to help install the TURBOWAYS 155 PCI MMF ATM Adapter and associated device driver software.

**Note:** Acronyms

- ATM: asynchronous transfer mode
- MMF: multi-mode fiber
- PCI: periferal compatible interface

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## ISO 9000

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

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## Related Publications

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

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## Trademarks

AIX is a trademark of International Business Machines Corporation.

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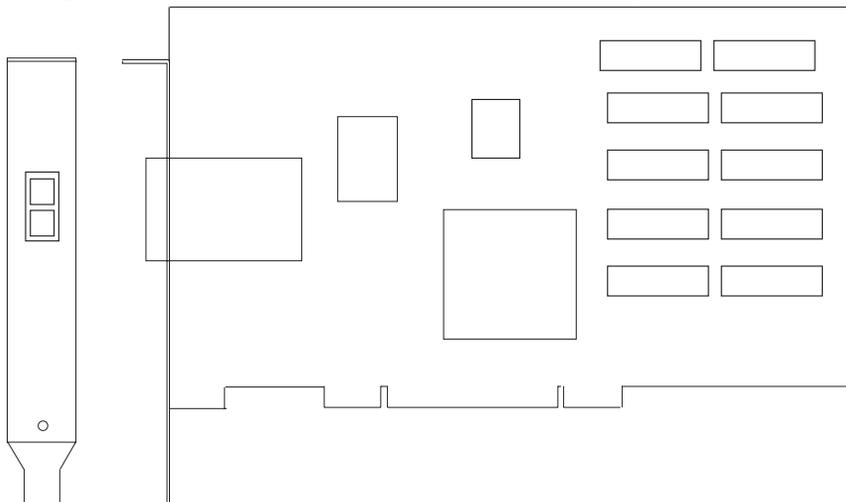
## Chapter 1. Overview

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 4.2.1.

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### Document Overview

The document provides instructions to install the TURBOWAYS 155 PCI MMF ATM Adapter with AIX and with ATM155 software. Instructions include directions to configure the TURBOWAYS 155 PCI MMF ATM Adapter.



TURBOWAYS 155 PCI MMF ATM Adapter.

**Note:** Instruction assumes you are connecting the TURBOWAYS 155 PCI MMF ATM Adapter on AIX to an ATM switch or concentrator.

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### 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 ATM155 Software and the TURBOWAYS 155 PCI MMF ATM Adapter” on page 2-1, to install the ATM155 software and to install and connect the TURBOWAYS 155 PCI MMF ATM Adapter.

Go to Chapter 3, “Configuring and Using ATM155 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 ATM155 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.

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## **Software Requirements**

The TURBOWAYS 155 PCI MMF ATM Adapter is supported on AIX Version 4.2.1. If support is required on an AIX release other than AIX 4.2.1, please ensure this adapter is supported on that release of AIX prior to install. Contact your support representative for assistance.

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## Chapter 2. Installing the ATM155 Software and the TURBOWAYS 155 PCI MMF ATM Adapter

This chapter explains how to install the TURBOWAYS 155 PCI MMF ATM Adapter with ATM155 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.

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### Preparing to Install the ATM155 Software

Insure your system is running AIX 4.2.1. 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.

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### Installing the ATM155 Software

This section explains how to install the AIX 4.2.1 ATM common code and the ATM155 software for the TURBOWAYS 155 PCI MMF ATM Adapter.

1. Turn the system unit power on.
2. Log in as **root**.
3. Insert the media containing the AIX 4.2.1 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.pci.14107c00`  
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. At the command line, type:  
`shutdown -F`  
and press Enter.  
Refer to your operating system User's Guide for instructions.
  18. Go to "Installing the Adapter."

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## Installing the Adapter

Be sure you have installed the ATM155 software as explained in Chapter 2, "Installing the ATM155 Software and the TURBOWAYS 155 PCI MMF ATM Adapter" on page 2-1. Refer to your system unit for specific instructions to install your adapter.

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## Verifying Adapter Available for Use

To verify that your newly installed TURBOWAYS 155 PCI MMF ATM 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 -Cc adapter | grep atm
```

and press Enter.
4. A list of adapters displays. Verify that the TURBOWAYS 155 PCI MMF ATM Adapter is in `Available` mode. If your TURBOWAYS 155 PCI MMF ATM Adapter is not available, run the diagnostics utility described in the Diagnostics section of Appendix A, "Troubleshooting" on page A-1.

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## Connecting the TURBOWAYS 155 PCI MMF ATM Adapter to the Network

Before using your TURBOWAYS 155 PCI MMF ATM Adapter, connect it to an ATM switch or concentrator.

**Note:** The connector 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 that conforms to the standard.



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## Chapter 3. Configuring and Using ATM155 Software

This chapter explains how to configure and how to use ATM155 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.

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### Configuring the Adapter

To configure the TURBOWAYS 155 PCI MMF ATM Adapter:

1. Turn your 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 155 PCI MMF ATM Adapter can be configured to use PVCs with or without configuring SVCs.

To configure the TURBOWAYS 155 PCI MMF ATM 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 ATM155 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. In the Remove an ATM Adapter panel, set KEEP definition in database to **no** and press Enter.
10. When removal is complete and the Command status changes from running to OK, press **F10** to exit SMITTY.

11. At the AIX command prompt, type:  
    `smitty install`  
    and press Enter.
12. From the Software Installation and Maintenance menu, select **Maintain Installed Software**.
13. From the Maintain Installed Software menu, select **Remove Software Products**.
14. In the Remove Software Products panel:
  - Type the SOFTWARE name, `devices.pci.14107c00`
  - To PREVIEW only, select **no**.
  - To REMOVE dependent software, select **yes**.
  - For DETAILED output? Select **yes** or **no**.
15. The ARE YOU SURE? panel appears:
  - To continue to remove the software, press Enter.
  - To cancel the uninstallation process, press **F3**.
16. When removal is complete and the Command status in the Command Status screen changes from `running` to `OK`, press **F10** to exit SMITTY.

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## 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 155 PCI MMF ATM Adapter, the value of VPI must be 0. VCI can be between 0 and 127 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 155 PCI MMF ATM Adapter supports multiple network interfaces.

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## 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.

---

## 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 will request 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 155 PCI MMF ATM 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
    - ATM 155 Mbit Adapter (read-only)
  - 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.
- ALTERNATE ATM MAC address
  - Type the MAC address in hexadecimal format (example: 0x0000D10008ED).

**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.

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.

- ATM Adapter PDU Size:
  - ATM Adapter PDU (Protocol Data Unit) Size field specifies the maximum packet size that the IP stack generates for the ATM interface.
  - Do not change the default value of 9180 unless another PDU size has been configured and is used by all other hosts and routers in the IP subnet.

To see the range of valid values for this setting press **F4**.

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 155 PCI MMF ATM 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 155 PCI MMF ATM 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 SELECTION screen, select **System Verification** and press Enter.
4. Follow the instructions on the screen.

---

## Troubleshooting

If diagnostics pass and your TURBOWAYS 155 PCI MMF ATM Adapter is not functioning:

1. Refer to your system unit documentation to disconnect power cables and remove covers.
2. Disconnect and reconnect all TURBOWAYS 155 PCI MMF ATM Adapter cables.
3. Remove and reseal the adapter.
4. Install the TURBOWAYS 155 PCI MMF ATM Adapter in a different slot if one is available.
5. After completing these steps, refer to your system unit documentation to reassemble your system unit and connect the power cord.
6. Reread the software instructions. Be sure software settings are correct.
7. If your TURBOWAYS 155 PCI MMF ATM Adapter still does not function, call your service representative.

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## Appendix B. Product Features and Specifications

Following is an overview of the TURBOWAYS 155 PCI MMF ATM Adapter features and a list of product specifications.

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### Features

The TURBOWAYS 155 PCI MMF ATM Adapter for AIX provides direct access to ATM networks. The TURBOWAYS 155 PCI MMF ATM Adapter provides dedicated 155 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 155 PCI MMF ATM Adapter:

- 32-bit PCI bus master
- Direct memory access (DMA)
- Dedicated 155 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) 4.2.1 device driver
- ATM user network interface (UNI 3.0 and 3.1) 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 MCA bus specifications.

### Environment

<b>Power dissipation</b>	Maximum 8 W
<b>Power VCC</b>	4.75 to 5.25 V
<b>Operating temperature</b>	10 to 40 °C
<b>Humidity</b>	8 to 80% noncondensing

### PCI Interface

<b>Size</b>	6.2" x 3.0" single-slot adapter
<b>Bus master</b>	32-bit bus master capability

---

## **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.

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### **Federal Communications Commission (FCC) Statement**

**Note:** The TURBOWAYS 155 PCI MMF ATM 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.

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  
Old Orchard Road  
Armonk, New York 10504  
Telephone: (919) 543-2193

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## **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.

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## **International Electrotechnical Commission (IEC) Statement**

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

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## **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.

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**Avis de conformité aux normes du ministère des Communications du Canada**

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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**Canadian Department of Communications Compliance Statement**

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

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**VCCI Statement**

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

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 equipment is in the Class 2 category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential area.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling.

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## **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.



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