

# ATMswitch 900

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## Installation and Configuration

Part Number: EK-DAHSF-IN. B01

**June 1997**

This manual describes how to install and configure the ATMswitch 900 modules.

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# Preface

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## Overview

### About This Manual

This manual describes how to install and configure the DIGITAL ATMswitch 900 modules in a DEChub 900 MultiSwitch and a DEChub ONE or DEChub ONE-MX docking station. It describes both the ATMswitch 900F (DAHSEF-MA) and the ATMswitch 900T (DAHST-MA) modules.

Refer to the *ATMswitch 900 Management* manual for detailed configuration information.

### Intended Audience

This manual is intended for use by personnel who will install and configure the ATMswitch 900 modules.

## Organization

This manual is organized as follows:

<b>Section</b>	<b>Description</b>
Chapter 1	Provides an overview of the ATMswitch 900 modules and describes their features.
Chapter 2	Lists the front and back panel features of the ATMswitch 900 modules and provides instructions for installing the modules in a DEChub ONE or DEChub ONE-MX docking station and a DEChub 900 MultiSwitch.
Chapter 3	Provides instructions for installing the setup port cable.
Chapter 4	Provides instructions for configuring the module in a DEChub ONE or DEChub ONE-MX docking station.
Chapter 5	Provides instructions for configuring the module in a DEChub 900 MultiSwitch.
Chapter 6	Provides information for checking the module's configuration.
Chapter 7	Provides instructions for removing the module from a DEChub ONE or DEChub ONE-MX docking station and a DEChub 900 MultiSwitch.
Appendix A	Provides installation-specific troubleshooting information using the LEDs.
Appendix B	Provides information for upgrading firmware and setting up the servers.
Appendix C	Provides product specifications.

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## Associated Documents

The following documents provide information relating to the module. To order any of these documents, refer to the section titled How to Order Additional Documentation.

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<b>Title and Order Number</b>	<b>Description</b>
<i>Open DECconnect Applications Guide</i> EC-G2570-42	Provides information to help plan and install networking systems based on DIGITAL's Open DECconnect system and networking products.
<i>DEChub 900 MultiSwitch Owner's Manual</i> EK-DH2MS-OM	Provides installation, use, security, and troubleshooting information for the DEChub 900 MultiSwitch.
<i>ATM Modular PHY Cards Installation</i> EK-DAGGM-IN	Describes how to install and verify the operation of the ATM modular PHY cards.
<i>ATMswitch 900 Management</i> EK-DAHSF-MG	Describes how to manage the ATMswitch 900 series of modules.

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## Online Services

To locate product-specific information, refer to the following online services:

**BBS** To read the Bulletin Board System, set your modem to 8 bits, no parity, 1 stop bit, and dial 508-486-5777 (U.S.).

**WWW** The Digital Equipment Corporation Network Products Business Home Page on the World Wide Web is at the following addresses:

North America: <http://www.networks.digital.com>

Europe: <http://www.networks.europe.digital.com>

Australia: <http://www.digital.com.au/networks>

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## Conventions

This manual uses the following conventions:

Convention	Description
<b>Bold Type</b>	Indicates user input.
Monospaced Type	Indicates system output.
<i>Italic Type</i>	Indicates a variable in examples. In text, indicates that a word or phrase is being emphasized to the reader.
16.20.54.156	The format of an IP address is the standard 4-octet dotted decimal notation, where each octet of the address is represented as a decimal value, separated by a decimal point (.).
[ ]	Contain default responses to the installation menu prompts.
<Return>	Indicates that you press the Return key.
DEChub 900	Refers to the DEChub 900 MultiSwitch.
DEChub ONE	Refers to the DEChub ONE or the DEChub ONE-MX docking station unless otherwise noted.

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## How to Order Additional Documentation

To order additional documentation, use the following information:

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<b>To Order</b>	<b>Contact</b>
By Telephone	USA (except Alaska, New Hampshire, and Hawaii): 1-800-DIGITAL (1-800-344-4825) Alaska, New Hampshire, and Hawaii: 1-603-884-6660 Canada: 1-800-267-6215
Electronically (USA only)	Dial 1-800-DEC-DEMO (For assistance, call 1-800-DIGITAL)
By Mail (USA and Puerto Rico)	DIGITAL EQUIPMENT CORPORATION P.O. Box CS2008 Nashua, New Hampshire 03061 (Place prepaid orders from Puerto Rico with the local DIGITAL subsidiary: 809-754-7575)
By Mail (Canada)	DIGITAL EQUIPMENT of CANADA LTD. 940 Belfast Road Ottawa, Ontario, Canada K1G 4C2 Attn.: A&SG Business Manager
Internationally	DIGITAL EQUIPMENT CORPORATION Attn.: A&SG Business Manager c/o local DIGITAL subsidiary or approved distributor
Internally	U.S. Software Supply Business (SSB) DIGITAL EQUIPMENT CORPORATION 8 Cotton Road Nashua, New Hampshire 03063

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## Safety

Any warning or caution that appears in this manual is defined as follows:

WARNING	Contains information to prevent personal injury.
CAUTION	Contains information to prevent damage to equipment.
VORSICHT	Enthält Informationen, die beachtet werden müssen, um den Benutzer vor Schaden zu bewahren.
ACHTUNG	Enthält Informationen, die beachtet werden müssen, um die Geräte vor Schaden zu bewahren.
DANGER	Signale les informations destinées à prévenir les accidents corporels.
ATTENTION	Signale les informations destinées à prévenir la détérioration du matériel.
AVISO	Contiene información para evitar daños personales.
PRECAUCIÓN	Contiene información para evitar daños al equipo.

The warnings and cautions that must be observed for the hardware described in this manual are listed below in English, German, French, and Spanish.

---

WARNING	Do not attempt to open the module under any circumstances—physical injury may occur. Only qualified service personnel are authorized to open the module.
VORSICHT!	Versuchen Sie auf gar keinen Fall, das Modul zu öffnen —es besteht Verletzungsgefahr. Module dürfen nur von entsprechend ausgebildetem Kundendienstpersonal geöffnet werden.
DANGER!	N'ouvrir cet appareil en aucun cas, sous peine de blessures corporelles. L'ouverture ne doit être effectuée que par un personnel d'entretien qualifié.
¡AVISO!	No se debe abrir el módulo bajo ninguna circunstancia; pueden ocurrir lesiones físicas. Sólo se autoriza al personal cualificado abrir el módulo.

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# Chapter 1

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## Product Introduction

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### Overview

#### Introduction

This chapter describes the ATMswitch 900 modules and their features.

#### In This Chapter

Topic	Page
What Are the ATMswitch 900 Series of Modules?	1-2
Features	1-3

What Are the ATMswitch 900 Series of Modules?

---

## What Are the ATMswitch 900 Series of Modules?

The ATMswitch 900 series of modules are 8-port ATM workgroup-level switches. The ATMswitch 900 series of modules provide full ATM compatibility to workgroups and extensions to the backbone network.

Two of the eight ports use ATM modular Physical Layer (modPHY) interfaces, allowing them to be configured for multimode fiber, single-mode fiber, T3, E3, or other media. The other six ports are fixed as multimode fiber (the ATMswitch 900F module) or twisted-pair (the ATMswitch 900T). When the ATMswitch 900 module is used in the DEChub 900 MultiSwitch (also referred to in this manual as the DEChub 900), you can direct ports 5 through 8 to the backplane of the DEChub 900 for interconnection to other hub modules with ATM link support.

You can configure the module in a DEChub 900 MultiSwitch or as a standalone unit in a DEChub ONE docking station. Throughout this manual, the term DEChub ONE refers to the DEChub ONE-MX or the DEChub ONE docking station unless otherwise noted.

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## Features

Your ATMswitch 900 module includes the following features:

- Six fixed ports, either:
  - Multimode fiber, STS-3c or STM-1 (155 Mb/s) for the ATMswitch 900F.
  - Unshielded twisted-pair (UTP) or screened twisted pair (ScTP), STS-3c or STM-1 (155 Mb/s) for the ATMswitch 900T.
- Two ports configurable via modular PHY interface for multimode fiber (MMF), single-mode fiber (SMF), T3, E3, UTP, ScTP, T1, or E1.
- 800 Mb/s throughput.
- 64K cell buffer.
- Up to 2,000 switched virtual circuits (SVCs) with EFCI, EPD, and/or FLOWmaster flow control.
- Standard ATM LAN Emulation Server.
- Q.2931 signaling, SVC (UNI 3.0 and 3.1).
- Automatic SVC routing.
- ATM Forum Interim Interswitch Signaling Protocol (IISP) compliance.
- Constant Bit Rate (CBR), Variable Bit Rate (VBR), Unspecified Bit Rate (UBR), and Available Bit Rate (ABR) over either SVCs or PVCs.
- Explicit Forward Congestion Indication (EFCI).
- SNMP management.
- FLOWmaster flow control support.

## Hotswap

The module's hotswap capability allows you to install or remove the module from a DEChub 900 without turning off power. The modPHY cards can also be installed or removed without turning off power.

## Features

### Configuration and Management

The following configuration and management options are available:

- Support for configuration and management through a command line interface and remotely via Telnet in both the DEChub 900 and the DEChub ONE docking station.
- Upgradeable device firmware (in nonvolatile Flash memory) using Trivial File Transfer Protocol (TFTP).
- SNMP Gets and Traps for network monitoring.

### SNMP

The MIBs supported by the ATMswitch 900 modules include:

- MIB-II (RFC 1213)
- ILMI MIB (UNI V3.0)
- DS1/E1 MIB (RFC 1406)
- DS3/E3 MIB (RFC 1407)
- SONET MIB (RFC 1595)
- ATM MIB (RFC 1695)
- DEC ATM MIB (V1.0)
- DEC ATM Signaling MIB
- DEC ATM Switch Chassis MIB
- DEC LAN Emulation Service MIBs (LES, BUS, LECS)
- Common DEChub 900 Objects MIB

## Chapter 2

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# Installing the Module

---

## Overview

### Introduction

This chapter describes how to install the ATMswitch 900 module in a DEChub ONE docking station and a DEChub 900 MultiSwitch.

If you are installing modPHY cards or connecting cables to either of the module's modPHY ports, refer to the *ATM Modular PHY Cards Installation* manual for cabling information.

### In This Chapter

Topic	Page
Module Components	2-2
Installing the Module in a DEChub ONE-MX Docking Station	2-8
Installing the Module in a DEChub ONE Docking Station	2-10
Installing the Module in a DEChub 900 MultiSwitch	2-12
Connecting the Cables	2-16

## Module Components

The following sections describe the front and back panel components for the ATMswitch 900 modules.

Table 2-1 and Table 2-2 describe the front panel components including the icons that are on the module. Table 2-3 describes the back panel components.

For more information about the module's LEDs, refer to Appendix A.

### ATMswitch 900F Front Panel Features

Table 2-1 describes the LED indicators and connectors on the front panel (Figure 2-1) of the ATMswitch 900F.

**Table 2-1: ATMswitch 900F Front Panel Features and Descriptions**



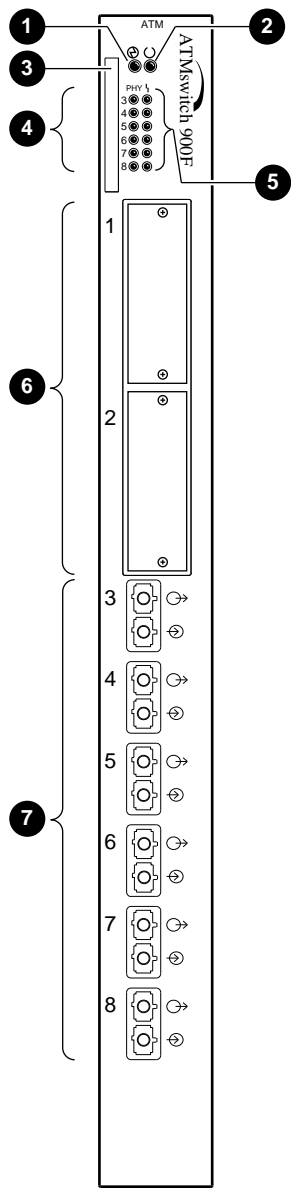
Item	Icon/Port	Name	Description
1		Power LED	On = the module has power. Off = the module has no power.
2		Module OK LED	On = the module passed self-test. Off = diagnostic or module failure. Blinking = partial failure.
3	Address label		Ethernet address
4	PHY	PHY LED	Indicates the state of the Physical layer interface.
5	 	FRU/Mode (Field Replaceable Unit/Mode) LED	Indicates the port's fault status or operational mode.
6	N/A	N/A	Modular PHY (modPHY) ports
7	N/A	N/A	Multimode fiber ports

Figure 2-1: ATMswitch 900F Front Panel LEDs and Connectors



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## Module Components

### ATMswitch 900T Front Panel Features

Table 2-2 describes the LED indicators and connectors on the front panel (Figure 2-2) of the ATMswitch 900T.

**Table 2-2: ATMswitch 900T Front Panel Features and Descriptions**



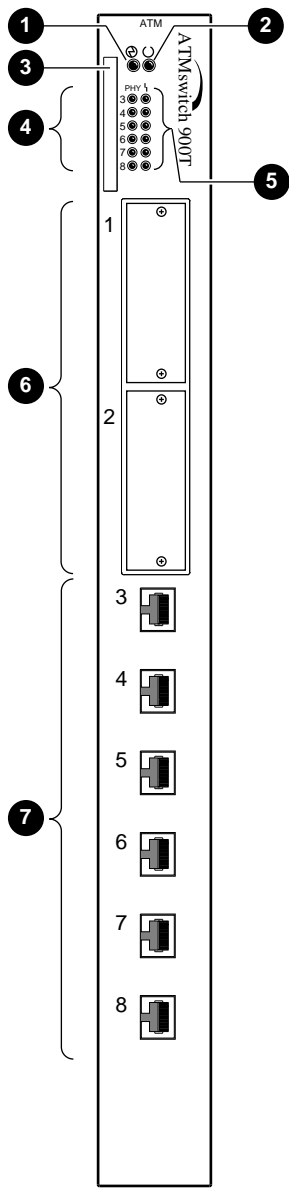
Item	Icon/Port	Name	Description
1		Power LED	On = the module has power. Off = the module has no power.
2		Module OK LED	On = the module passed self-test. Off = diagnostic or module failure. Blinking = partial failure.
3	N/A	Address label	Ethernet address
4	PHY	PHY LED	Indicates the state of the Physical layer interface.
5	 	FRU/Mode (Field Replaceable Unit/Mode) LED	Indicates the port's fault status or operational mode.
6	N/A	N/A	Modular PHY (modPHY) ports
7	N/A	N/A	Multimode fiber ports



Figure 2-2: ATMswitch 900T Front Panel LEDs and Connectors



LJ-05689.A14

## Module Components

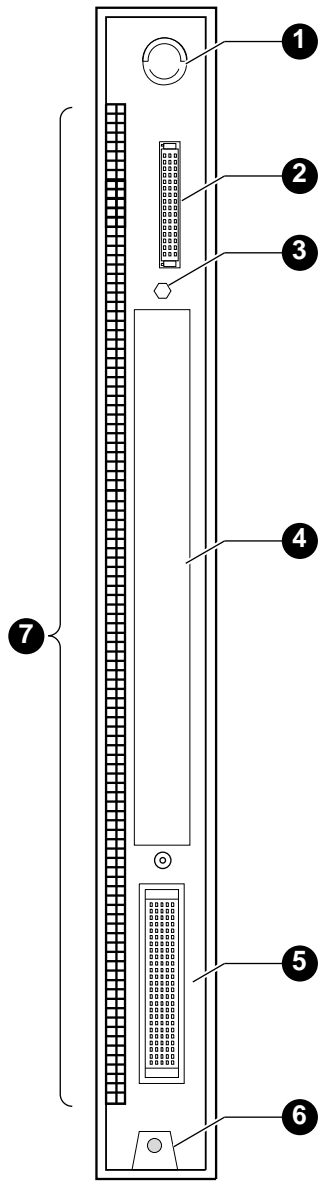
### Back Panel Features

Table 2-3 lists the features on the back panel (Figure 2-3) of the ATMswitch 900 modules.

**Table 2-3: Back Panel Features and Descriptions**

<b>Item</b>	<b>Name</b>	<b>Description</b>
1	Locking tab	Locks the module into the DEChub 900 or the DEChub ONE.
2	48-pin connector	Provides network and power connections to the module when the module is installed in a DEChub 900 or a DEChub ONE.
3	Grounding bolt	Provides a chassis ground connection between the module and a DEChub 900 or a DEChub ONE.
4	Manufacturing label	Lists the module's part number, serial number, revision level, and power requirements.
5	160-pin connector	Provides network and power connections to the module when the module is installed into a DEChub 900 or a DEChub ONE.
6	Mounting tab	Secures the module when it is installed into a DEChub 900 or a DEChub ONE.
7	Grounding fingers	Provide additional chassis grounding between the module and a DEChub 900 or a DEChub ONE.

Figure 2-3: Back Panel Layout



## Installing the Module in a DEChub ONE-MX Docking Station

Be sure that all the FDDI Modular Physical-Medium Dependent (ModPMD) modules are removed from the DEChub ONE-MX docking station before connecting the DEChub ONE-MX to the ATMswitch 900 module. The following table describes the tasks necessary for installing the module in a DEChub ONE-MX:

---

<b>Task</b>	<b>Description</b>
1	Place the mounting tab located on the bottom of the module into the mounting slot on the bottom of the DEChub ONE-MX (Figure 2-4).
2	Pivot the module into place to engage both the 160- and the 48-pin connectors.
3	Raise the locking tab to clear the plastic protruding interlocking feature of the network module.
4	Gently push the module and the DEChub ONE-MX together until the two are joined, taking care to align the connectors properly on each device. The module locks into the DEChub ONE-MX just below the locking tab.
5	After the connectors are fully seated, press the locking tab to lock the units together.
6	Go to page 2-11.

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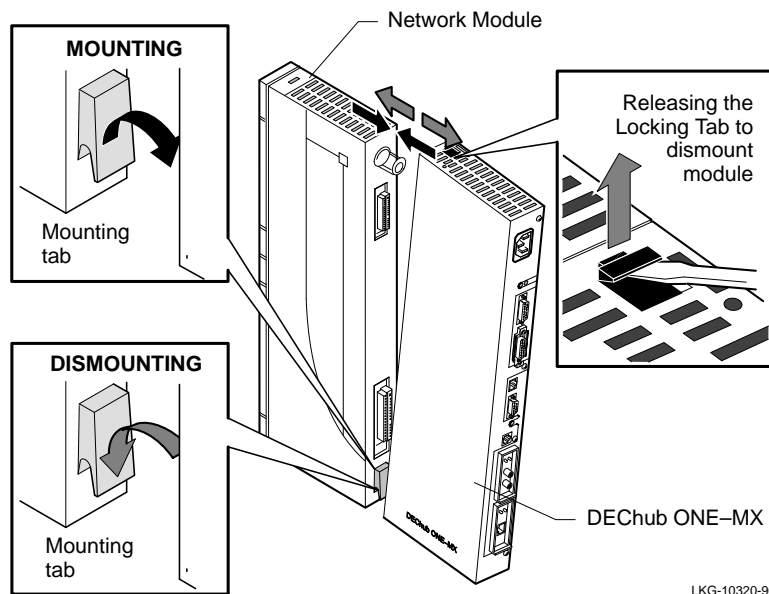
### **CAUTION**

Do not connect the power cord until the network module is secured to the DEChub ONE or DEChub ONE-MX, mounted (tabletop or rack-mounted), and ready for self-test.

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Installing the Module in a DEChub ONE-MX Docking Station

Figure 2-4: Installing the Module in a DEChub ONE-MX



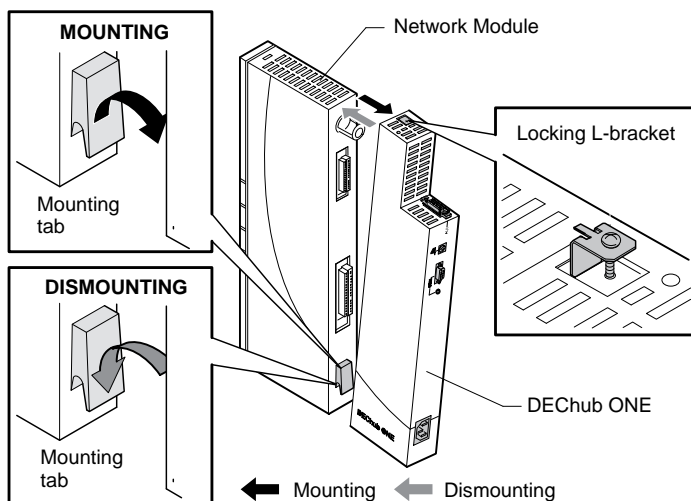
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## Installing the Module in a DEChub ONE Docking Station

The following table describes the tasks necessary for installing the module in a DEChub ONE docking station:

Task	Description
1	Place the mounting tab located on the bottom of the module into the mounting slot on the bottom of the DEChub ONE (Figure 2-5).
2	Lift the locking L-bracket screw on the DEChub ONE.
3	Pivot the module into place to engage both the 160- and 48-pin connectors.
4	Hold the network module and DEChub ONE together and tighten the locking L-bracket screw. This secures the network module to the DEChub ONE and activates the network module's hotswap switch.
5	Go to page 2-11.

**Figure 2-5: Installing the Module in a DEChub ONE**



## Installing the Module in a DEChub ONE Docking Station

The following table describes the tasks to perform once the module has been installed in a DEChub ONE or DEChub ONE-MX docking station:

---

Task	Description
1	Verify initial LED operation.
2	Verify initialization.

---

### Task 1: Verify Initial LED Indications

When you connect the power cable, ensure that the power LED on the top is green and that the Module OK LED is dark for about 3 minutes before turning green. Once the Module OK LED turns green, the module is ready for configuration.

Ensure that the Module OK LED remains green. The PHY LEDs will flash through various patterns to indicate phases of initialization. If there are any initialization problems, the Module OK LED will remain unlit.

If you have previously powered on the module, check that the Power LED and Module OK LED are green.

---

#### NOTE

Refer to Appendix A, Problem Solving, if the LEDs do not operate as described.

---

### Task 2: Verify Initialization

If you have configured the terminal or PC when the module is powered up, the following prompt appears when initialization is complete and the Module OK LED turns green:

```
ATMswitch->
```

If the module is already powered up when the terminal is connected and the Power and Module OK LEDs are solid green, the prompt appears when you press the <Return> key. The next installation step appears on page 2-16.

## Installing the Module in a DEChub 900 MultiSwitch

The ATMswitch 900 module's hotswap feature allows you to install the module into a DEChub 900 without turning off power. Seating the module initiates the module's power-up sequence if enough power is available.

The following table describes the tasks necessary for installing the module in a DEChub 900 MultiSwitch:

---

Task	Description
1	Compare the power ratings.
2	Seat the module into the DEChub 900.
3	Verify initial LED operation.

---

### Task 1: Compare the Power Ratings

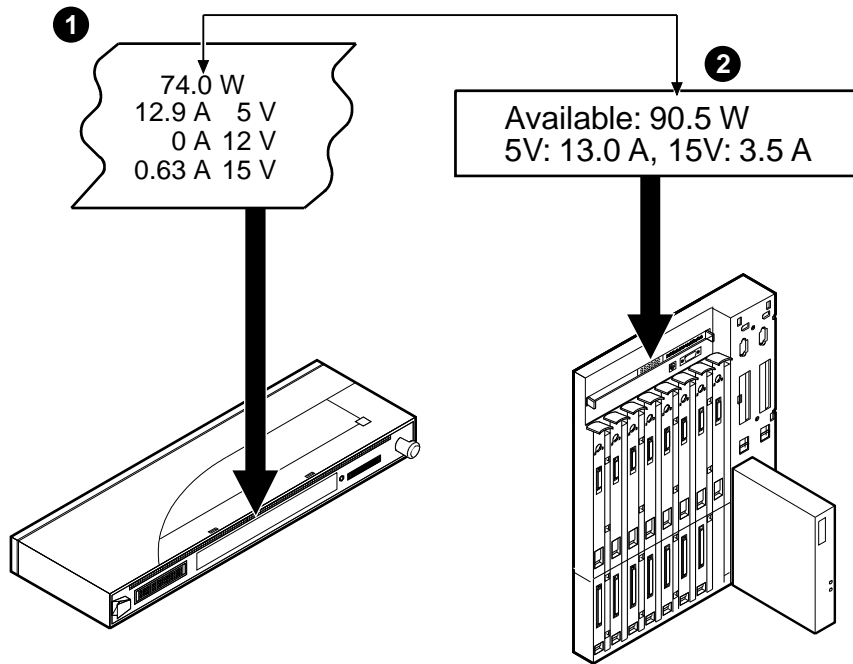
Compare the module's power and current ratings (1) with the values shown in the Hub Manager status display (2) (see Figure 2-6 for an example of where you should look for this information). If the values on the module's manufacturing label do not exceed the values shown in the Hub Manager status display, go to task 2.

If the power or current ratings on the module's manufacturing label exceed the values shown in the Hub Manager status display, add another power supply to the DEChub 900 (refer to the *DEChub 900 MultiSwitch Owner's Manual*).



Installing the Module in a DEChub 900 MultiSwitch

Figure 2-6: Module Power Ratings



LJ-05407.A14

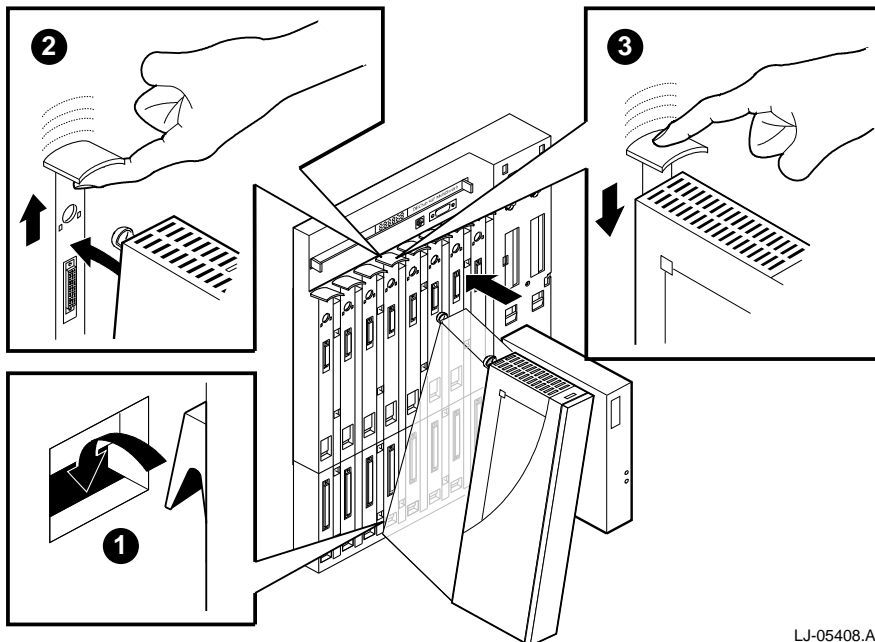
## Installing the Module in a DEChub 900 MultiSwitch

### Task 2: Seat the Module into the DEChub 900 MultiSwitch

To seat the module, perform the following steps (Figure 2-7):

Step	Action
1	Place the module's mounting tab into a mounting slot (1) on the DEChub 900.
2	Pull up the release lever (2) to its unlocked position.
3	Pivot the module on the mounting slot and align the connectors.
4	Firmly push the module onto the backplane connectors.
5	Press down on the release lever (3) to ensure that the module is locked.

Figure 2-7: Seating the Module



LJ-05408.A14

## Installing the Module in a DEChub 900 MultiSwitch

### Task 3: Verify Initial LED Operation

Verify that the module's Power LED and the Module OK LED light within 3 minutes (Figure 2-8). The LEDs light in the following two stages:

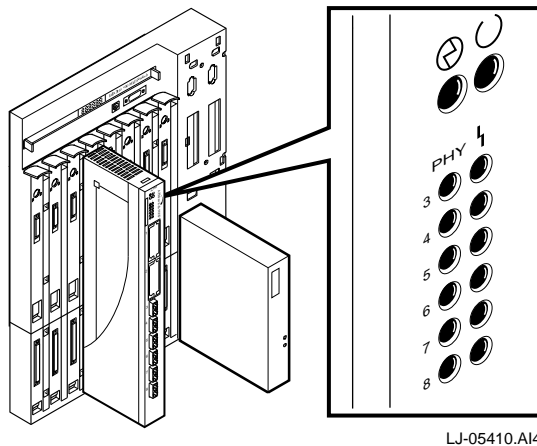
Stage	Description
1	The Power LED lights when power is applied to the ATMswitch 900 module, then the module performs a self-test. During self-test, various LEDs light as the module cycles through a series of tests.
2	After the module completes self-test, the Module OK LED lights and remains lit. After the module completes its initialization process, the Hub Manager status display shows the following:

```
ATMswitch  
up
```

#### NOTE

Refer to Appendix A, Problem Solving, if the LEDs do not operate as described.

Figure 2-8: LED Location



## Connecting the Cables

If you are connecting cables to either of the module's modPHY ports, refer to the *ATM Modular PHY Cards Installation* manual for cabling information.

The following table describes the options for connecting the cables to the fixed ports.

---

Topic	Page
Connecting MMF Cables	2-16
Connecting Twisted-Pair Cables	2-17

---

### Connecting MMF Cables

Depending on your network configuration requirements, connect the appropriate cables. If you are not using the DEChub 900 backplane for network connections, then this task is necessary. See your network manager if you are not sure which cables to connect. Transmit and receive ports are indicated by arrows that point away from (transmit) or into (receive) the port.

---

#### NOTE

All cables should be installed, tested, and tagged at the site, before this installation. Make sure that the bend radius of any fiber-optic cable is 1 inch (2.5 cm) or greater. To avoid optical power loss, do not touch the fiber ends.

---

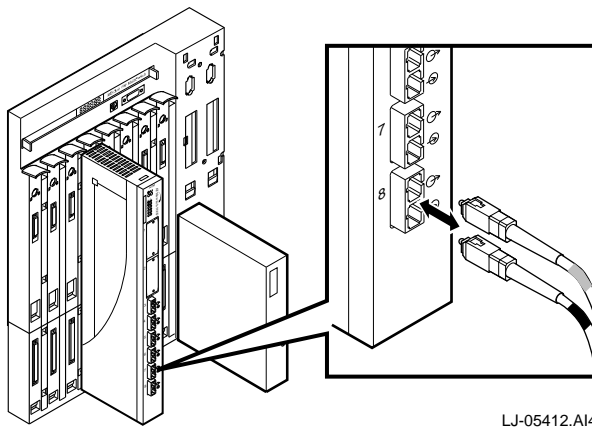
To connect the multimode fiber-optic cable connector, complete the following steps:

---

Step	Action
1	Remove dust caps from the port and cable.
2	Line up the transmit cable connector with the transmit port and the receive cable connector with the receive port. Insert the connectors, ensuring that the key is correctly positioned (Figure 2-9).

---

**Figure 2-9: Multimode Fiber-Optic Cable Connection**



After the module cables are installed, go to Chapter 3, Installing the Setup Port Cable.

## Connecting Twisted-Pair Cables

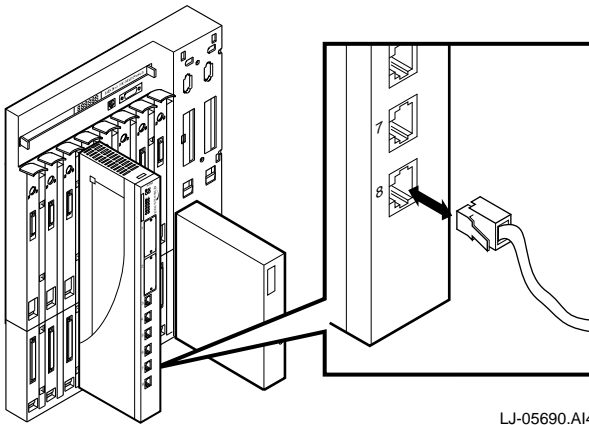
Depending on your network configuration requirements, connect the appropriate cables. If you are not using the DEChub 900 backplane for network connections, then this task is necessary. See your network manager if you are not sure which cables to connect.

To connect the unshielded or screened twisted-pair cables, complete the following steps:

Step	Action
1	Align the key of the modular jack (MJ) plug with the locking key of the MJ receptacle (Figure 2-10).
2	Push the MJ plug into the receptacle until the plug mates fully with the locking key. You will hear a snapping sound when the locking key engages.

## Connecting the Cables

**Figure 2-10: Twisted-Pair Cable Connection**



After the module cables are installed, go to Chapter 3, Installing the Setup Port Cable.

## Chapter 3

---

# Installing the Setup Port Cable

---

## Overview

### Introduction

This chapter describes how to connect the setup port on the DEChub 900 MultiSwitch and the DEChub ONE to a terminal or a PC. You can then initialize the module's parameters such as the IP address, which you need for remote access to the module.

### In This Chapter

Topic	Page
Physical Signaling Standards	3-2
Setup Port Device Cabling	3-3
Connecting the Setup Port	3-4

## Physical Signaling Standards

Signals from the DEChub 900 Hub Manager setup port and from the DEChub ONE docking station setup port conform to the EIA-232D signaling standard at 9600 baud. The port appears as a data terminal equipment (DTE) device.

The DEChub 900 Hub Manager setup port is compatible with devices that use the EIA-423 signaling standard.



---

## Setup Port Device Cabling

The setup port (Figure 3-1) on the DEChub 900 MultiSwitch or the DEChub ONE docking station can be connected to a terminal or PC using the following cables and adapters:

<b>If the setup port device is</b>	<b>Use this cable</b>	<b>With this adapter</b>
PC with a 9-pin D-Sub communications port	BN24H-xx <sup>1</sup>	H8571-J
Terminal with a 25-pin D-Sub connector	BN24H-xx <sup>1</sup>	H8575-A
Terminal with a 6-pin MMJ connector	BN24H-xx <sup>1</sup>	Not required.

<sup>1</sup> xx indicates cable length in meters.

## Connecting the Setup Port

To connect the setup port, complete the following steps:

Step	Action
1	Ensure that the transmit and receive baud rates on the setup port device are set to 9600 baud.
2	Connect the setup port device to the setup port connector on either the DEChub 900 or the DEChub ONE docking station (Figure 3-1).

The following legend identifies the setup port cabling illustrated in Figure 3-1.

Item	Description
1	SLIP OBM (Serial Line IP Out-of-Band Management Port)
2	Setup Port
3	Setup Port Device
4	FDDI ModPMD Port

---

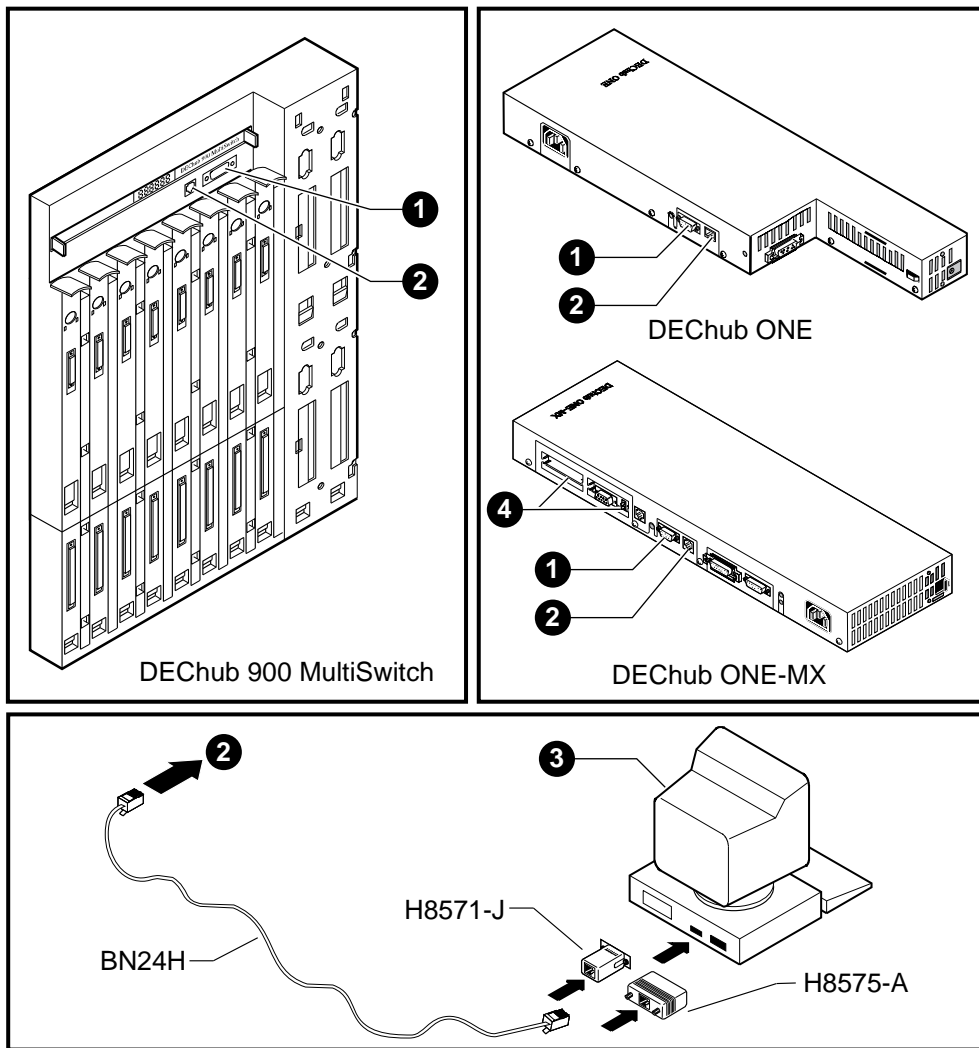
### CAUTION

Remove any FDDI ModPMDs from the ModPMD port of the DEChub ONE-MX.

---

Connecting the Setup Port

Figure 3-1: Device, Cable, and Connector Identification



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## Chapter 4

---

# Configuring the Module in a DEChub ONE

---

## Overview

### Introduction

This chapter describes how to configure your ATMswitch 900 module when it resides in a DEChub ONE docking station.

Once you configure the module, you can check its configuration as described in Chapter 6, then manage it using the console command interface in the *ATMswitch 900 Management* manual.

### In This Chapter

---

Topic	Page
Accessing the Setup Port	4-2
Using Console Commands to Configure the Module	4-3
Setting Up an Ethernet Connection	4-6

---

## Accessing the Setup Port

You can access the module locally from the setup port, then configure basic parameters of the module for remote access.

---

<b>Step</b>	<b>Action</b>
1	To access the module locally, plug the terminal cable into the setup port on the docking station (Figure 3-1). This procedure assumes that you have installed and cabled the module as described in Chapter 2 and Chapter 3.
2	Assign the following information by using console commands: <ul style="list-style-type: none"><li>• An IP address</li><li>• A subnet mask</li></ul>

---

There is no password protection on the setup port. You can use all commands once physical access to the setup port is available.

---

## Using Console Commands to Configure the Module

The following table describes the console commands that you can use once the module is installed in a DEChub ONE docking station:

Topic	Page
Restart With Factory Defaults	4-3
Reset With Current Settings	4-3
Set IP Address	4-4
Set IP Gateway Address	4-4
Set Read/Write Community Name	4-4
Password Enable/Disable	4-4
Set Password	4-5
Lock Telnet Access	4-5

### Restart With Factory Defaults

Use this command to reset the module with its original default settings.

When you execute this command, password protection will be disabled, previously stored passwords will be deleted, and the module will reboot. If the module is rebooted again, it will come up with all of the user-created settings except password enable and the user-defined passwords. When the module comes up with default settings, any configurable parameter may be modified. Any parameter that has been modified will then show the changed parameter value upon subsequent resets.

```
ATMswitch-> restart_factory_defaults
```

### Reset With Current Settings

Use this command to reset the module with its previously configured parameters.

```
ATMswitch-> reboot
```

## Using Console Commands to Configure the Module

### Set IP Address

Use this command to set the IP address used on the Ethernet interface. If the IP address has not been set, the module will try to use BootP to obtain an IP address. You must have an IP address to access Telnet.

```
ATMswitch-> set_IP_address
```

### Set IP Gateway Address

Use this command when the IP address will not be set through BootP. Enter an IP gateway address enclosed in quotation marks as shown below.

```
ATMswitch-> set_gateway_IP_address("ip_gateway_addr")
```

For example, you might enter the following command:

```
ATMswitch-> set_gateway_IP_address("16.17.18")
```

### Set Read/Write Community Name

Use this command to enable SNMP access. Enter between 4 and 32 characters. The factory default is `private`.

```
ATMswitch-> set_rw_comm_name
```

### Password Enable/Disable

Use this command to enable or disable password protection for both the user and manager accounts. The commands can be executed from either the console port or a Telnet connection but will be used only to control Telnet access. The factory default is `password_disable`.

```
ATMswitch-> password_enable
```

```
ATMswitch-> password_disable
```

If password protection is enabled, the Telnet login process prompts you for the account login name and password. The account login name must be either `user` or `manager`, and these login names cannot be changed. The default password is `username` for the user account and `managername` for the manager account. The following example shows the Telnet login process using the default values for the user account:

```
ATMswitch login: user
```

```
Password: username
```

```
ATMswitch->
```



## Using Console Commands to Configure the Module

If you lose your passwords, restart your module with the factory defaults by using the `restart_factory_defaults` command or the appropriate ATMswitch 900 INSTALLATION MENU option (for modules installed on the DEChub 900 MultiSwitch).

### Set Password

Use this command to change the passwords required when password control is enabled for Telnet.

```
ATMswitch-> setpasswd
```

You will be prompted for additional information. The default password is `username` for the user account and `managername` for the manager account.

### Lock Telnet Access

Use this command to disable Telnet access to the module. This command can be given only from the console port and will not be preserved if you reboot the module.

```
ATMswitch-> shellLock(1)
```

Use this command to enable Telnet access without having to reset the module.

```
ATMswitch-> shellLock(0)
```

## Setting Up an Ethernet Connection

An Ethernet connection is necessary for allowing remote and Telnet access to the ATMswitch 900 console facility.

To set up an Ethernet connection, follow these steps:

---

<b>Step</b>	<b>Action</b>
1	For remote network access, insert the MAU into the AUI connector as shown in Figure 4-1. An example MAU would be a DECXM-AA transceiver.
2	Slide the latch mechanism to lock the MAU into place.
3	Connect the ThinWire cable from the MAU to your PC.

---

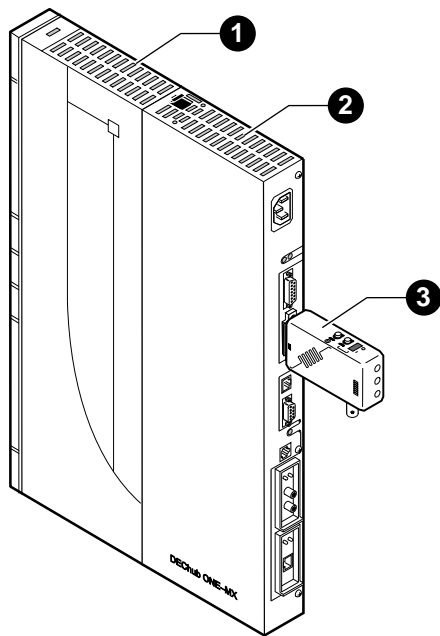
The following legend identifies the components for connecting the MAU to the AUI port on the docking station (Figure 4-1):

---

<b>Item</b>	<b>Description</b>
1	Network module
2	DEChub ONE-MX
3	DECXM-AA transceiver (MAU) and Ethernet port

---

**Figure 4-1: Connecting a MAU to the AUI Port**



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## Telnet Access

You must set the module's IP address to manage it using Telnet. Once the module is configured, all of the management functions are remotely accessible including those described in the *ATMswitch 900 Management* manual.

## SNMP Through Ethernet Access

You must set the read/write community name and the IP address before using SNMP. Once the IP address and read/write community name are configured, you can use the SNMP capabilities as described in the *ATMswitch 900 Management* manual.



## Chapter 5

---

# Configuring the Module in a DEChub 900

---

## Overview

### Introduction

This chapter describes how to configure your ATMswitch 900 module when it resides in a DEChub 900 MultiSwitch. It includes information on how to configure the module for remote Ethernet access by using the DEChub 900 MultiSwitch setup port.

The steps discussed in this chapter must be done using a local terminal connected to the setup port as described in Chapter 3.

### In This Chapter

---

Topic	Page
Accessing the Setup Port	5-2
DEChub 900 MultiSwitch Installation Menu	5-3
Using Menus to Configure the Module	5-5
Setting Up an Ethernet Connection	5-13

---

## Accessing the Setup Port

You can access the ATMswitch 900 module locally from the setup port on the DEChub 900 MultiSwitch backplane, then configure the module's basic parameters. The setup port provides menus that allow you to configure parameters required to enable remote access on the ATMswitch 900 module. All other configuration and management must be done using either Telnet or SNMP.

---

<b>Step</b>	<b>Action</b>
1	Use menus to assign the following information: <ul style="list-style-type: none"><li>• An IP address for Telnet and SLIP access</li><li>• A subnet mask</li><li>• Read/write SNMP community name</li></ul>

---

After setup, you can check the module's configuration as described in Chapter 6.

Examples of the setup screen displays are provided in this section to aid in the description of the setup port and to display the options that are available. Because they are examples only, the displays can vary from the actual screen displays on your setup port device. Boldface type in the screen display examples indicates user input.

There is no password protection on the setup port. Once physical access to the setup port is available, all commands and management functions can be used.

## DEChub 900 MultiSwitch Installation Menu

The following screen is an example of the DEChub 900 MultiSwitch INSTALLATION MENU.

To access the module's setup screen, you must choose option [9] Start Redirect Mode.

The following example shows the dialog associated with this option:

```
DEChub 900 MultiSwitch
=====
DEChub 900 MultiSwitch INSTALLATION MENU

[1] Reset with Factory Defaults
[2] Reset with Current Settings
[3] Show Current Settings
[4] Configure IP...
[5] Dump Error Log
[6] Downline Upgrade
[7] Configure Out-of-Band Port...
[8] Start Event Display Mode
[9] Start Redirect Mode...
[10] Product-Specific Options . . .

=====
Enter selection number: 9
```

## DEChub 900 MultiSwitch Installation Menu

### [9] Start Redirect Mode

The Start Redirect Mode option redirects the Hub Manager setup port to the setup port of any network module (such as the ATMswitch 900F) that is installed into the DEChub 900 MultiSwitch matrix backplane. Choosing this option allows you to set up or obtain the status of an installed network module by accessing the specified network module's installation menu.

After you choose the Start Redirect Mode option from the DEChub 900 MultiSwitch INSTALLATION MENU, the screen display prompts you for a slot number (1 through 8) as shown in the following example. After you enter the number of the slot in which the ATMswitch 900 module is installed, the console is redirected to this slot.

---

#### NOTE

The slot number may change to reflect the slot number in which your module is installed.

---

The following example shows the dialog associated with this option:

```
Enter selection number: 9 <Return>
Enter the slot number for redirection (1-8): 8 <Return>

Console redirected to 8: ATMswitch 900F

Attempting connection [Ctrl/C to abort] ...
```



---

## Using Menus to Configure the Module

This section describes the options that are available from the ATMswitch 900 module's INSTALLATION MENU. If redirection is successful after you press the Return key, the module's INSTALLATION MENU (such as the ATMswitch 900F INSTALLATION MENU) appears as shown below.

```
ATMswitch 900F - slot 8
=====
                ATMswitch 900F INSTALLATION MENU

                [1] Restart with Factory Defaults
                [2] Restart with Current Settings
                [3] Show Current Settings
                [4] Configure IP...

                [Ctrl/C] Return to Hub Manager Installation Menu
=====
                Enter selection:  4
```

If the module was previously configured and restarted, the menu provides only two options:

```
ATMswitch 900F - slot 8
=====
                ATMswitch 900F INSTALLATION MENU

                * * * * *
                To fully manage this device telnet to one of the
                following IP addresses.
                Out-of-Band: 16.20.152.19
                * * * * *

                [1] Restart with Factory Defaults
                [2] Restart with Current Settings

                [Ctrl/C] Return to Hub Manager Installation Menu
=====
                Enter selection:
```

## Using Menus to Configure the Module

The following table describes your next installation menu options.

<b>Topic</b>	<b>Page</b>
[1] Restart with Factory Defaults	5-6
[2] Restart with Current Settings	5-7
[3] Show Current Settings	5-8
[4] Configure IP...	5-9

### **[1] Restart with Factory Defaults**

This option allows you to reset the default passwords and disable password protection. The module restarts with default values for all parameters but leaves the module's other configured nonvolatile parameters at their current values. Password protection remains disabled and the password value is the factory default.

## Using Menus to Configure the Module

### [2] Restart with Current Settings

This option restarts the module but leaves the module's configured nonvolatile configuration storage parameters at their current values. Allow approximately 1 minute for the module to restart.

The following example shows the dialog associated with this option:

```
Enter selection: 2

ATMswitch 900F - slot 8
=====

                RESTART WITH CURRENT SETTINGS

This selection will restart your system with the current
configuration settings.

=====

Press Y to confirm [N]: n
Module Removed! Connection Closed!

Press Return for Main Menu ...
```

## Using Menus to Configure the Module

### [3] Show Current Settings

This option shows the module's current settings. If the module is being configured for the first time, some of the fields will be blank.

The following example shows the screen display associated with this option:

```
Enter selection: 3

ATMswitch 900F - slot 8
=====
ATMswitch 900F, HU=X1.0, RO=Release 2.0FT,SU=Release 2.0FT, RODATE=Mon Jul 15 1
SysUpTime           : 00:10:20  0 restarts
SNMP Read/Write Community :

-----
Interface      IP Address      Subnet Mask      Def. Gateway      Other Info
-----
Out-of-Band
-----

Press Return for Main Menu ...
```

Once all of the desired configuration information has been set, this menu option should be selected to verify the parameter settings.

## Using Menus to Configure the Module

### [4] Configure IP...

The Configure IP... option provides you with four selections.

The following example shows the dialog associated with this option.

```
Enter selection: 4

ATMswitch 900F - slot 8
=====
IP CONFIGURATION

[1] Set SNMP Read/Write Community
[2] Set In-Band Interface IP Address
[3] Set Out-of-Band Interface IP Address
[4] Return to Main Menu

=====

Enter selection :
```

The following pages describe IP configuration options.

Topic	Page
[1] Set SNMP Read/Write Community	5-10
[2] Set In-Band Interface IP Address	5-11
[3] Set Out-of-Band Interface IP Address	5-12

## Using Menus to Configure the Module

### [4] Configure IP... (Cont.)

#### [1] Set SNMP Read/Write Community

This option prompts you to enter the module's read/write community name.

The following example shows the dialog associated with this option:

```
Enter selection: 1

ATMswitch 900F - slot 8
=====
                SET SNMP READ/WRITE COMMUNITY

Format: The format for a community name is a string,
        consisting of 4 to 31 printable ASCII characters,
        that describes the relationship between an SNMP
        agent and one or more SNMP managers. The string
        defines the authentication mechanism that is employed
        to validate the use of the community by the sending
        SNMP entity.
=====

Enter the community string [private]: private <Return>

                Press Return for IP Configuration Menu ...
```

## Using Menus to Configure the Module

### [4] Configure IP... (Cont.)

#### [2] Set In-Band Interface IP Address

This option prompts you to change or enter the IP address and subnet mask for use with Telnet and SNMP over Ethernet. The module does not need to be configured with a subnet mask for communications with stations located on the same subnet as the module.

The format for these values is the standard 4-octet dotted decimal notation, where each octet of the address is represented as a decimal value, separated by a decimal point (.).

The following example shows the dialog associated with this option:

```
Enter selection: 2

ATMswitch 900F - slot 8
=====
IN-BAND INTERFACE IP ADDRESS CONFIGURATION

Format: The standard 4 octet dotted decimal notation in which
each octet of the address is represented as a decimal
value, separated by a '.' character.

example: 16.20.40.156

To delete the address, enter 0 in the appropriate address
field.
-----
Interface   IP Address   Subnet Mask   Def. Gateway   Other Info

Out-of-Band
-----
Enter the IP Address [16.22.32.223]: 16.22.32.223 <Return>
Enter the Subnet Mask [0.255.255.255] 0.255.255.255 <Return>
Enter the Default Gateway [100.0.0.0]: 100.0.0.0 <Return>
Press Return for IP Configuration Menu ...
```

## Using Menus to Configure the Module

### [4] Configure IP... (Cont.)

#### [3] Set Out-of-Band Interface IP Address

This option prompts you to change or enter the IP address and subnet mask for the out-of-band management (OBM) interface connector on the backplane or DEChub 900 MultiSwitch using the Serial Line Interface Protocol (SLIP). The module does not need to be configured with a subnet mask for communications with stations located on the same subnet as the module.

The format for these values is the standard 4-octet dotted decimal notation, where each octet of the address is represented as a decimal value, separated by a decimal point (.).

The following example shows the dialog associated with this option:

```
Enter selection: 3

ATMswitch 900F - slot 8
=====

OUT-OF-BAND INTERFACE IP ADDRESS CONFIGURATION

Format: The standard 4 octet dotted decimal notation in which
each octet of the address is represented as a decimal
value, separated by a '.' character.

example: 16.20.80.40

To delete the address, enter 0 in the appropriate address
field.
-----
Interface      IP Address      Subnet Mask      Def. Gateway      Other Info
-----
Out-of-Band
-----
=====
Enter the IP Address [16.22.32.223]: 16.22.32.223 <Return>
Enter the Subnet Mask [0.255.255.255] 0.255.255.255 <Return>
Press Return for IP Configuration Menu ...
```



---

## Setting Up an Ethernet Connection

To access the full set of capabilities of the ATMswitch 900 module, you must set up a remote connection from a PC to the backplane of the DEChub 900 MultiSwitch as described below.

---

<b>Step</b>	<b>Action</b>
1	Install a DECrepeater in the DEChub 900 MultiSwitch. Look for the appropriate repeater to use with your PC cabling. For example, use a DECrepeater 90C to connect to a ThinWire Ethernet.
2	Connect the repeater directly to a PC.

---



## Chapter 6

---

# Checking the Module's Configuration

---

## Overview

### Introduction

This chapter describes the commands you can use to check the configuration of the ATMswitch 900 module once it has been installed. It also describes procedures for initial installation, subsequent reconfiguration, and fault isolation activities.

The operation of the module's Telnet server and the ATMswitch 900 console facility is verified. You must set up the Ethernet connection as described in Chapter 4 or Chapter 5 to use these commands. The full capabilities of the ATM console are described in the *ATMswitch 900 Management* manual.

### In This Chapter

---

Topic	Page
Connecting to the Module Using Telnet	6-2
Configuration Guidelines for Physical Layer Parameters	6-3
Checking Versions	6-8
Checking the Port Status	6-9
Performing Loopback Testing	6-11

---

## Connecting to the Module Using Telnet

The ATMswitch 900 console interface is implemented as a Telnet server connection on the module. To access a console session using Telnet, set up your Ethernet connection (see Chapter 4 or Chapter 5) and issue the following command from a DIGITAL UNIX system:

```
#telnet ip-address
```

where *ip-address* is the module's IP address as shown in the following example:

```
#telnet 16.17.18.19
```

```
Trying 16.17.18.19...
```

```
Connected to 16.17.18.19
```

```
ATMswitch->
```

If password protection is enabled, the Telnet login process prompts you for the account login name and password. The account login name must be either `user` or `manager`, and these login names cannot be changed. The default password is `username` for the user account and `managername` for the manager account. The following example shows the Telnet login process using the default values for the user account:

```
ATMswitch login: user
```

```
Password: username
```

```
ATMswitch->
```

If you lose your passwords, restart your module with the factory defaults by using the `restart_factory_defaults` command or the appropriate ATMswitch 900 INSTALLATION MENU option (for modules installed on the DEChub 900 MultiSwitch).

## Configuration Guidelines for Physical Layer Parameters

This section describes the configuration guidelines for Physical layer (PHY) parameters that you should be aware of when trying to manage your ATMswitch 900 module. In particular, you must manually configure the following PHY parameters if the default values for the ATMswitch 900 module do not agree with those of an attached node.

- Framing
- Cell mapping
- Clock source
- Line buildout

All these parameters have default values during normal operation. If you use these default values, loopback testing should be successful and indicate any faults.

You can set the values of some parameters to support interoperability with other equipment using the console commands or SNMP. However, if you change the default values for the clock source or line buildout parameters, loopback testing might fail. Check the firmware release notes for information about other PHY types that might not be listed.

## Configuration Guidelines for Physical Layer Parameters

### Framing

The framing parameters must be the same at both ends of a connection or it might result in an inoperational connection. The values of the framing parameters for different PHY types are shown in Table 6-1.

**Table 6-1: Framing Parameter Values**

PHY Type	Values	Default Value
155 Mb/s MMF	SONET, SDH	SONET
155 Mb/s SMF	SONET, SDH	SONET
155 Mb/s UTP	SONET, SDH	SONET
T1 UTP	G.804/T1E1	G.804/T1E1
T3 coaxial	C-bit, M23	C-bit
E1 UTP	G.704	G.704
E3 coaxial	G.832, G.751	G.832

- 1) SONET STS-3c as defined by Bellcore and ANSI.
- 2) SDH STM-1 as defined by CCITT.
- 3) C-bit parity mode as defined by the C-bit positions in the frame being used for the FEBE, path parity, and mode indication.
- 4) M23 as defined in ANSI T1.102.

You can change the framing parameter using the menu interface. You would use selection 4 from the Switch Configuration Menu (selection 3 from the Main Menu).

## Configuration Guidelines for Physical Layer Parameters

### Cell Mapping

The cell mapping parameters must be the same at both ends of a connection or it will result in an inoperational connection. The values of the cell mapping parameters for different PHY types are shown in Table 6-2.

**Table 6-2: Cell Mapping Parameter Values**

PHY Type	Values	Default Value
155 Mb/s MMF	ADM	ADM
155 Mb/s SMF	ADM	ADM
155 Mb/s UTP	ADM	ADM
T1 UTP	ADM	ADM
T3 coaxial	ADM, PLCP	PLCP
E1 UTP	ADM, PLCP	ADM
E3 coaxial	ADM	ADM

- 1) PLCP supports the option of transmitting cells with the Physical Layer Convergence Protocol (PLCP).
- 2) ADM supports the option of transmitting cells with ATM Direct Mapping (ADM) as defined by ATM Forum UNI 3.1 specification.

### Clock Source

The clock source parameter is configured to meet the needs of the application. In LAN applications, the clock source is usually a local reference. In some WAN applications, the port must be manually configured to operate in loop timing. Each PHY type supports two modes of transmitter operation as defined by the source of the clock used for transmission.

- Local clock source operation:  
Transmission is based on a local clock source. All PHY types support this mode, which is the default configuration.  
Some PHY types accept a local clock reference from the host system and can transmit synchronously to other ports.
- Loop-timing operation:  
Host data is transmitted based on the external clock recovered by the same port's receiver. All PHY types have this capability, although it must be selected by management.

## Configuration Guidelines for Physical Layer Parameters

This mode of operation is often required for connections to a public service provider. If loop-timing operation is selected but the received clock is absent, the port will transmit based on a local reference until a received clock is again recovered by the port.

The values of the clock source parameters for different PHY types are shown in Table 6-3.

**Table 6-3: Clock Source Parameter Values**

PHY Type	Values	Default Value
155 Mb/s MMF	local, loop timing	local
155 Mb/s SMF	local, loop timing	local
155 Mb/s UTP	local, loop timing	local
T1 UTP	local, loop timing	local
T3 coaxial	local, loop timing	local
E1 UTP	local, loop timing	local
E3 coaxial	local, loop timing	local

When the switch is rebooted, the nonvolatile records for each populated port are examined. If a record is found for the PHY type detected, the stored setting is used. If a record is not found, local timing is used. This implies that if a PHY type is changed while the switch is powered down, switch initialization will not necessarily yield the default setting.

The same sequence of actions occur if a port is unpopulated at switch powerup, but is populated later.

When modPHY hotswap yields a PHY type change, the new link is reinitialized with the default setting (local timing). When modPHY hotswap does *not* result in PHY type change, the link is reinitialized with its last known setting (if it is not overridden by a loss of signal or loss of frame condition). Note that hotswap does not trigger a nonvolatile record update. So, a subsequent switch reboot might change the timing setting because of a previously stored record for that port and PHY type.

You can change the clock source parameter using the menu interface. You would use selection 6 from the Switch Configuration Menu (selection 3 from the Main Menu).



## Configuration Guidelines for Physical Layer Parameters

### Line Buildout

The line buildout parameter is configured to meet the needs of the application. In LAN applications, the line buildout is usually not important and not configurable. The default value of the line buildout parameter should allow the entire range of media options in most LAN applications.

In WAN applications for North America, manual control of the line buildout parameter is sometimes necessary for T1 and T3 media. For T1 and T3 media, the default values shown are sufficient for all supported lengths for connections between DIGITAL equipment and their recommended cables.

The values of the line buildout parameters for different PHY types are shown in Table 6-4.

**Table 6-4: Line Buildout Parameter Values**

PHY Type	Values	Default Value	Supported Length
155 Mb/s MMF	0 to 2 km		0 to 2 km
155 Mb/s SMF	0 to 50 km		0 to 50 km
155 Mb/s UTP	0 to 100 m		0 to 100 m
T1 UTP	0 to 110 ft 110 to 220 ft 220 to 330 ft 330 to 440 ft 440 to 550 ft 550 to 600 ft >600 ft	0 to 110 ft	0 to 660 ft
T3 coaxial	0 to 225 ft 225 to 450 ft	0 to 225 ft	0 to 450 ft
E1 UTP	0 to 200 m		0 to 200 m
E3 coaxial	0 to 200 m		0 to 200 m

## Checking Versions

The `versions` command displays the version numbers for the Boot ROM and the application image that are running on the module as shown in the following example:

```
ATMswitch-> versions

ROMVersion: ATMswitch 900 Release 1.0[472] : Wed May 21 12:01:52 EDT 1997
AppVersion: ATMswitch 900 Release 1.0[472] : Wed May 16 12:01:52 EDT 1997
Host IP Address for flash downloads 16.17.18.19.
Host Boot Filename //hubsw113_cfg.
value = 0 = 0x0
ATMswitch->
```

---

## Checking the Port Status

The `show_port_status` command checks the operation of the Physical layer protocols, circuitry, and cables. Use this command to gather the status indicated by the module LEDs when direct observation is not possible, such as during remote access.

---

### NOTE

If this `show_port_status` command indicates that the ports are working, then signaling, application, and network management protocols should operate as specified. You can go directly to the *ATMswitch 900 Management* manual and skip the remaining procedures in the chapter.

---

An example of the command display is shown in Figure 6-1. It assumes the following configuration: ports 1 and 2 are empty; ports 3 and 4 are installed with loopback connectors; port 5 is redirected; ports 6, 7, and 8 are not connected.

Refer to Table A-2 in Appendix A for an explanation of LED status.

## Checking the Port Status

**Figure 6-1: Port Status Display**

```
ATMswitch-> show_port_status
```

PORT	PHY	FRU/MODE
1	-	-
	not configured	-
2	-	-
	not configured	-
3	GREEN	OFF
	working	-
4	GREEN	OFF
	working	-
5	OFF	BLINK GREEN
	no input	redirected
6	OFF	OFF
	no input	-
7	OFF	OFF
	no input	-
8	OFF	OFF
	no input	-

---

### NOTE

OFF means that the associated LED is not lit. A dash (-) indicates that a description is not applicable. These may be normal or exception conditions as described in the next section.

---

---

## Performing Loopback Testing

The `show_port_status` command may be used with loopback connectors to test the installation of the ATMswitch 900 module or a modPHY card. Refer to the *ATM Modular PHY Cards Installation* manual for loopback connector part numbers for modPHY modules and fixed port types. You can perform a simple loopback test for any port on the module by completing the following steps:

---

Step	Action
1	Connect a loopback connector between the transmit and receive lines of the port.
2	Verify that the PHY LED is green.
3	Use the <code>show_port_status</code> command at the console prompt. See Figure 6-1 for an example.
4	Check the results of the <code>show_port_status</code> command. If there is a fault, refer to Appendix A, Problem Solving Using LEDs. Two fault conditions are described below.
5	If there are no faults, you should remove the loopback cables.

---

### Positive Test Results

A loopback connector plus the green indication (shown on ports 3 and 4 in this example) indicate that the port has been tested and is good. A real connection to another system should work. All other ports are untested in the above example and have normal indications. Remove the loopback connectors once the testing is complete.

### Normal Indications

If the PHY LED is blinking green, a network manager has disabled the port, preventing normal operation. If the FRU/Mode LED is blinking green, the front panel connector is disabled while the port is internally connected to the DEChub 900 MultiSwitch backplane. Although these are not fault conditions, a port in this state will not pass the loopback test or operate a normal connection. Use the console or another network management tool to obtain additional information.

## Performing Loopback Testing

### Fault Conditions

The following two fault conditions can occur during loopback testing:

- A loopback connector or a connection to another port is installed and the PHY indication is not green, and neither of the Port LEDs are blinking green.
- The PHY or FRU/Mode LED is amber.

Once the physical layer connection is established, consult the *ATMswitch 900 Management* manual to perform fault isolation for higher layer protocols.

The indications of ports 1 and 2 should obey the same rules if a modPHY module is installed. A fault is indicated if the modPHY module is physically present and not installed as shown in Figure 6-1. In this case, consult either Appendix A of this manual or the *ATM Modular PHY Cards Installation* manual to determine which module must be replaced to correct the fault.

# Chapter 7

---

## Removing the Module

---

### Overview

#### Introduction

This chapter describes how to remove the ATMswitch 900 module from a DEChub ONE or a DEChub 900 MultiSwitch.

#### In This Chapter

Topic	Page
Removing the Cables	7-2
Removing the Module from a DEChub ONE-MX Docking Station	7-4
Removing the Module from a DEChub ONE Docking Station	7-5
Unseating the Module from a DEChub 900 MultiSwitch	7-6

---

## Removing the Cables

If you are removing cables from the module's modPHY ports, refer to the *ATM Modular PHY Cards Installation* manual for cabling information.

The following table describes the options for removing the cables from the fixed ports:

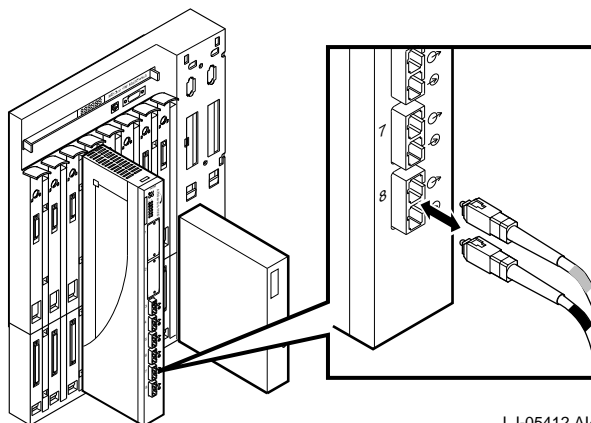
Topic	Page
Removing MMF Cables	7-2
Removing Twisted-Pair Cables	7-3

### Removing MMF Cables

To remove cables from the fixed MMF ports of the module, complete the following tasks (Figure 7-1):

Steps	Action
1	Pull the MMF connector from the port.
2	Replace the dust caps on the connector and the PHY port.

**Figure 7-1: MMF Cable Removal**



LJ-05412.AI4

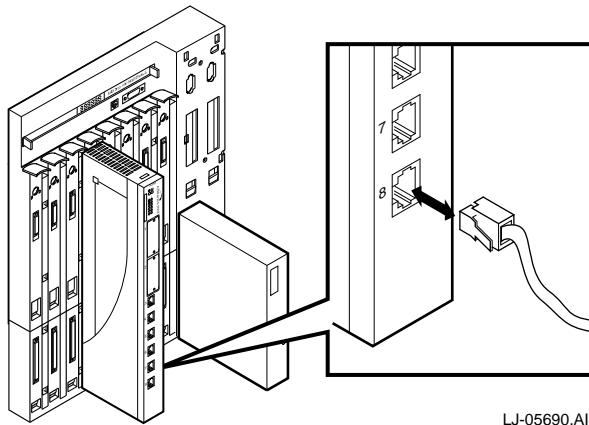


## Removing Twisted-Pair Cables

To remove unshielded or screened twisted-pair cables from the fixed ports of the ATMswitch 900T module, complete the following tasks (Figure 7-2):

Steps	Action
1	Squeeze the locking key against the main body of the MJ plug.
2	Remove the MJ plug from the receptacle.

**Figure 7-2: Twisted-Pair Cable Removal**



LJ-05690.A14

---

## Removing the Module from a DEChub ONE-MX Docking Station

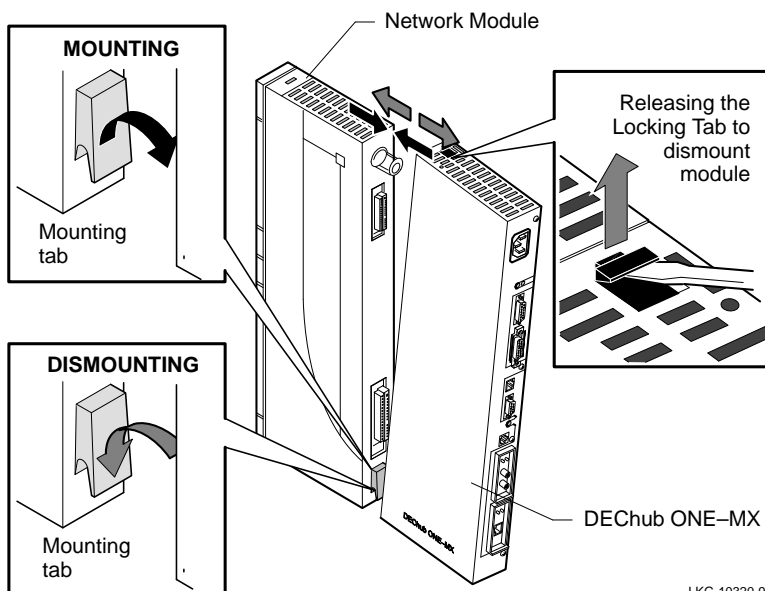
To remove the module from a DEChub ONE-MX (Figure 7-3), complete the following steps:

---

Step	Action
1	Shut off the ac power to the DEChub ONE-MX. Either turn the wall receptacle switch to off or disconnect the ac power cord from the wall receptacle.
2	Disconnect cables from the DEChub ONE-MX as required.
3	Disconnect cables from the ATMswitch 900 module as required.
4	Pry up the locking tab in the top of the hub using a flat-blade screwdriver. When the locking tab snaps open, separate the network module from the hub.

---

**Figure 7-3: Removing the Module from a DEChub ONE-MX**



LKG-10320-961

---

## Removing the Module from a DEChub ONE Docking Station

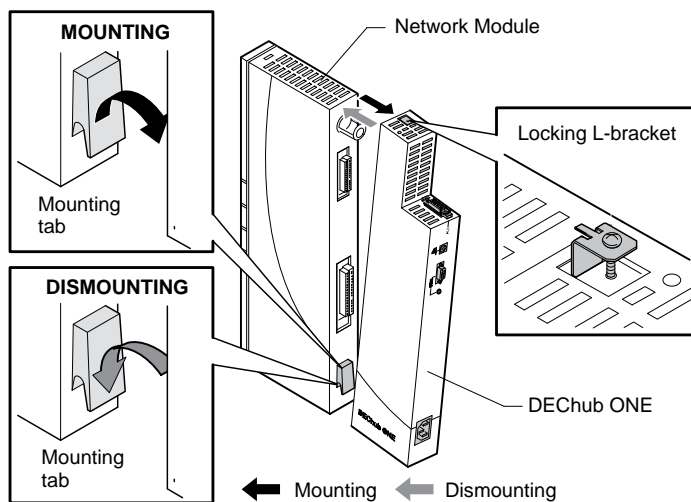
To remove the module from a DEChub ONE (Figure 7-4), complete the following steps:

---

Step	Action
1	Shut off the ac power to the DEChub ONE. Either turn the wall receptacle switch to off or disconnect the ac power cord from the wall receptacle.
2	Disconnect cables from the DEChub ONE as required.
3	Disconnect cables from the ATMswitch 900 module as required.
4	Loosen and lift the locking L-bracket screw on the hub. Pivot the module away from the hub.

---

**Figure 7-4: Removing the Module from a DEChub ONE**



## Unseating the Module from a DEChub 900 MultiSwitch

---

### Unseating the Module from a DEChub 900 MultiSwitch

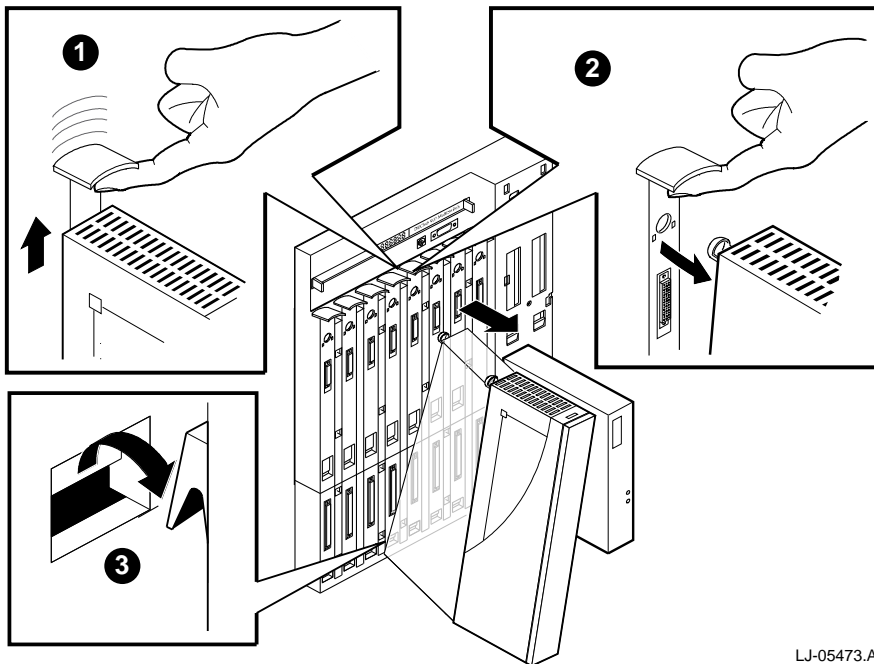
To unseat the module from the DEChub 900 MultiSwitch (Figure 7-5), complete the following steps:

---

Step	Action
1	Lift the release lever (1) located at the top of the DEChub 900 slot.
2	While holding up the release lever (2), pivot the module back on its bottom mounting tab (3).
3	Remove the module.

---

Figure 7-5: Unseating the Module



LJ-05473.A14

# Appendix A

---

## Problem Solving

---

### Overview

#### Introduction

This appendix describes how to diagnose and solve problems with the module using the LED displays.

#### In This Appendix

Topic	Page
LED Descriptions	A-2
Problem Solving Using LEDs	A-4

---

## LED Descriptions

The module's LEDs provide dynamic indications of the status of the module. The LEDs can be in various states (on, off, or flashing), depending on the operational status of the module.



### Normal Powerup

When the module's power is initially turned on, the following events occur:

Event	Description
1	The module's Power LED lights as soon as power is applied to the unit.
2	The module initiates its built-in self-test. LEDs indicate that the module is running various subroutines as part of the self-test.
3	After the successful completion of self-test (within 3 minutes after power is applied), the Module OK LED lights, and remains lit.

Table A-1 shows the states that are possible for the module's Power and Module OK LEDs. Table A-2 shows the LED conditions for the six fixed ports. For information on modPHY LEDs, refer to the *ATM Modular PHY Cards Installation* manual.

**Table A-1: LED States**

LED Name		Off	On (Green)	Flashing
Power		No power to module.	Module receiving power.	N/A
Module OK		Self-test failed (if more than 3 minutes have elapsed).	Passed self-test.	Nonfatal failure. Example: Fan failure.

**Table A-2: LED Conditions**

<b>Indication</b>	<b>Action</b>
FRU/Mode LED is amber.	The diagnostics have detected a fault. If this occurs on a fixed port, the faulty port is unusable while the rest of the unit is functional. If this occurs on a modPHY module, try the module in another slot to determine whether the card or the host module contains the fault. Replace the faulty component or contact your DIGITAL sales representative.
FRU/Mode LED is blinking green.	The port has been redirected elsewhere.
PHY LED is green.	No action is necessary. The port is working properly and a link is established.
PHY LED is amber.	The port is inactive due to excessive media errors. Perform loopback testing to isolate the problem.
PHY LED is blinking green.	The port has been disabled by management.
PHY LED is off.	Check your connections. If you cannot establish a link to an attached system, make sure that you have the correct cable for the particular type of port. For example, SMF cables are not interchangeable with MMF cables though they look similar.

---

## Problem Solving Using LEDs

When diagnosing a problem with the module, note that the problem is often indicated by the combined states of the module's LEDs. Table A-3 lists the typical combined states of the LEDs for various error conditions that can occur during initialization of the module, along with probable causes and corrective actions.

**Table A-3: Solving Problems Using LEDs**

Symptom	Probable Cause	Corrective Action
Power LED is off.	The module is not receiving +5 Vdc.	<p>Check the power status on the Hub Manager status display.</p> <p>If the Hub Manager status display indicates that power is available for this module, press the release lever and reseal or remove the module.</p> <p>Inspect the module's 48- or 160-pin connectors for bent or broken pins. If pins are bent or broken, replace the module.</p> <p>If the problem persists, either replace the module or contact your service representative to correct the problem.</p>

(continued)

---



## Problem Solving Using LEDs

Table A-3 (Cont.): Solving Problems Using LEDs

Symptom	Probable Cause	Corrective Action
Module OK LED is off and the LEDs for port 8 are blinking.	Firmware load is in progress.	Refer to Table A-4 for information about the LEDs that indicate firmware load progress.
Module OK LED is off and the LEDs for port 8 are not blinking.	Self-test in progress.	Wait for self-test to complete.
Module OK LED does not light within 3 minutes (longer if downloading firmware).	Self-test failed.	Lift the release lever momentarily to repeat the self-test.  If self-test fails again, replace the module. If the problem persists, contact your service representative to correct the problem.
Module OK LED is flashing, but module continues to operate normally.	A nonfatal error occurred.	Turn power off and on. If the problem persists, either replace the module or contact your service representative to correct the problem.

## Problem Solving Using LEDs

### Firmware Load Progress LEDs

When the switch is loading firmware, the Module OK LED is off and the PHY and FRU/Mode LEDs for port 8 are blinking. The four PHY and FRU/Mode LEDs for ports 3 through 6 indicate the load progress as shown in Table A-4.

**Table A-4: LED Indications of Firmware Load Progress**

FRU3	PHY3	FRU4	PHY4	FRU5	PHY5	FRU6	PHY6	Condition
Amber	Off	Off	Off	Off	Off	Off	Off	BootP request timed out and response was not received.
Green	Off	Off	Off	Off	Off	Off	Off	BootP request was successful and response was received.
Green	Amber	Off	Off	Off	Off	Off	Off	Configuration file download was attempted and failed.
Green	Green	Off	Off	Off	Off	Off	Off	Configuration file download succeeded.
Green	Green	Amber	Off	Off	Off	Off	Off	Kernel image download was attempted and failed.
Green	Green	Green	Off	Off	Off	Off	Off	Kernel image download succeeded.
Green	Green	Green	Amber	Off	Off	Off	Off	Commit kernel image to Flash failed.
Green	Green	Green	Green	Off	Off	Off	Off	Commit kernel image to Flash succeeded.

(continued)

## Problem Solving Using LEDs

Table A-4 (Cont.): LED Indications of Firmware Load Progress

FRU3	PHY3	FRU4	PHY4	FRU5	PHY5	FRU6	PHY6	Condition
Green	Green	Green	Green	Amber	Off	Off	Off	Application image download was attempted and failed.
Green	Green	Green	Green	Green	Off	Off	Off	Application image download succeeded.
Green	Green	Green	Green	Green	Amber	Off	Off	Commit application image to Flash failed.
Green	Green	Green	Green	Green	Green	Off	Off	Commit application image to Flash succeeded.
Green	Green	Green	Green	Green	Green	Amber	Off	Decompression of application image to Flash failed; application image version does not match kernel version.
Green	Green	Green	Green	Green	Green	Green	Off	Application image has loaded from Flash to RAM successfully.

After the firmware load completes successfully, the PHY and FRU/Mode LEDs for port 8 stop blinking and the module begins the self-test.

If the firmware load fails, the PHY and FRU/Mode LEDs for port 8 continue blinking and the other LED indications stop changing.

## Problem Solving Using LEDs

### Diagnostic LEDs

When the Module OK LED indicates a fault, the four FRU/Mode LEDs for ports 3 through 6 are used to report self-test failures when initializing the module. These FRU/Mode LEDs indicate the failures listed in Table A-5.

**Table A-5: LED Indications for Diagnostics**

<b>FRU/ Mode 3</b>	<b>FRU/ Mode 4</b>	<b>FRU/ Mode 5</b>	<b>FRU/ Mode 6</b>	<b>Condition</b>
Off	Amber	Amber	Off	UART access
Off	Amber	Amber	Amber	UART access 2
Off	Off	Amber	Amber	Boot ROM
Off	Amber	Off	Off	RAM test
Amber	Off	Off	Off	Ethernet test
Amber	Off	Off	Amber	Ethernet test 2

If the self-test fails and the FRU/Mode LED for a modPHY card is lit, there might be a problem with the modPHY card. Remove the modPHY card to see whether the module initializes and the Module OK LED turns on.

If the self-test succeeds, the Module OK LED is green. If the module is still not operational, check the configuration and any error logs using your management tools. Note that failures caused by factors that might be external to the module are never indicated as self-test failures. For example, if the Ethernet connection is not configured properly, a self-test failure is not reported.

# Appendix B

---

## Upgrading the Firmware

---

### Overview

#### Introduction

This appendix describes the procedures for upgrading the firmware for the ATMswitch 900 module. Consult the release notes and the `READ_ME.TXT` files for the firmware release to determine the correct versions.

#### In This Appendix

Topic	Page
Copying the Firmware	B-2
Loading the Firmware	B-3
Setting Up the Servers	B-4

## Copying the Firmware

The ATMswitch 900 firmware image is located in the release area of the DIGITAL FTP site (`ftp.digital.com`). The name of the firmware image is in the `READ_ME.TXT` file found in the `/pub/DEC/GIGAswitchATM` directory. Copy the image to your system using these commands:

```
# ftp ftp.digital.com  
username: anonymous  
password: your_internet_address
```

```
ftp> cd /pub/DEC/GIGAswitchATM  
ftp> bin  
ftp> get image_name.tar image_name.tar  
ftp> bye
```

To unpack the new image:

```
# tar -xvf image_name.tar
```

This command creates a subdirectory (named after the image) within your current working directory and unpacks files into this subdirectory.

---

## Loading the Firmware

The firmware for the module is divided into two components, the kernel and the application, which are loaded separately. The kernel consists of the operating system, protocol stack, and basic control routines. The application contains the diagnostics and higher level functions such as management, signaling, and routing.

A firmware release contains a kernel and an application image with a unique version number.

---

### NOTE

The BootP (if used) and TFTP servers must be set up correctly to upgrade the firmware. Refer to page B-4 for more information about setting up your servers. Instead of the BootP server, you can use the `set_download_info` command to upgrade your firmware.

---

### Upgrading the Kernel and Application Images

To downline load both the kernel and application images when upgrading firmware, use the control file described on page B-4. The lines in the control file are used by the appropriate modules to download the proper images for that module.

After setting up the control file, reboot the module by using the `reboot` command at the console prompt. If the kernel version is still incorrect, make sure your control file is set up properly and try rebooting again.

Upgrading the firmware for the module is controlled by using the `set_download_info` and the `force_image_reload` console commands. Refer to the *ATMswitch 900 Management* manual for more information about these commands.

### LED Indications During Module Initialization

During initialization, the LEDs indicate the progress in the loading of Flash and RAM. Refer to Appendix A for more information about the LEDs.

## Setting Up the Servers

The BootP and TFTP servers are used to upgrade software and to assign an IP address to the ATMswitch 900 module. The BootP server must be set up to respond to BootP requests from the module.

### Setting Up the TFTP Server

This section describes the procedure for setting up TFTP locally on your DIGITAL UNIX system.

---

Step	Action
1	Log in as root or superuser. Go to the root directory using the <code>cd</code> command and create the <code>tftpboot</code> directory using the <code>mkdir</code> command.
2	Copy the image files to the <code>/tftpboot</code> directory on your server using the <code>cp</code> command. Make sure that these files have the correct permission (world has read access) using the <code>ls -l</code> command. If you need to change the permission, use the <code>chmod</code> command.
3	In the same directory, create a control file named <code>A900Rxx</code> , where <code>xx</code> is the version number for your firmware (for example, <code>V1.0</code> would be <code>10</code> ). The control file contains the following lines: <pre>00000000notused notused A900      A900R10.ROM    A900R10.BIN</pre>

---

Table B-1 identifies the location of the fields in the control file.

---

**Table B-1: Field Locations in Control File**

---

Line	Field
1	Reserved
2	Reserved
3	Three fields on each line separated by spaces indicate the hardware type, ROM file name, and application file name.

---

Comment lines start with a number sign (#). Blank lines are also considered comment lines.



## Setting Up the Servers

The first two lines are ignored. (They are reserved for other uses.) The third line and any subsequent lines should contain three fields separated by spaces to indicate the hardware type, the ROM file name, and the application file name. A900 is the ATMswitch 900 module.

The files in the `/tftpboot` directory for Version 1.0 are:

<b>File</b>	<b>Description</b>
A900R10.CTL	Load control file
A900R10.ROM	Kernel image for ATMswitch 900 module
A900R10.BIN	Application image for ATMswitch 900 module

## Setting Up the Servers

### Setting Up the BootP Server

This section describes the procedure for setting up a DIGITAL UNIX system as the BootP server.

Step	Action
1	Log in as root or superuser.
2	<p>Verify that the following lines are in the <code>/etc/inetd.conf</code> file using the <code>more</code> command.</p> <pre>bootps dgram udp wait root /usr/sbin/bootpd bootpd -d tftp dgram udp wait root /usr/sbin/tftpd tftpd -r /tftpboot</pre> <p>If these lines do not exist or are commented out (preceded by a number sign), edit the file and include these lines or remove the number sign. After editing the file, you must stop and restart the <code>inetd</code> process by:</p> <ol style="list-style-type: none"><li>Determining the process ID (PID) of the <code>inetd</code> process using the <code>ps -aux   grep inetd</code> command.</li><li>Stopping the <code>inetd</code> process using the <code>kill -9 pid</code> command, where <code>pid</code> is the PID from the preceding command.</li><li>Restarting the <code>inetd</code> process using the <code>usr/sbin/inetd &amp;</code> command.</li></ol>
3	<p>On the server system, the TFTP load control file controls the downline load of both the kernel image and the application image. The entry in the BootP server's <code>/etc/bootptab</code> file that corresponds to the switch's Ethernet address contains the name of the load control file, the startup flag, and the file specifications of the load images. The module's Ethernet address is printed next to the LEDs on the front panel. Note that the downline load occurs over the Ethernet, not over the ATM links.</p>

## Setting Up the Servers

Check the firmware upgrade documentation for the name and location of the firmware image and any release information used for setting up this file.

Set up the `etc/bootptab` file to include the information for the ATMswitch 900 module in the following format:

```
node:ht=hw-type:ha=hw-addr:ip=ip-addr:sm=subnet-mask:gw=gw-addr:hd=home-dir:bf=boot-file
```

where:

<i>node</i>	Is the unique node name of the ATMswitch 900 module.
<i>hw-type</i>	Is the hardware type. For Ethernet, the value is 1.
<i>hw-addr</i>	Is the hardware address (MAC or Ethernet address) for the module.
<i>ip-addr</i>	Is the IP address for the module.
<i>gw-addr</i>	Is the default gateway address. This optional field is used as the inet address of the default router if specified.
<i>home-dir</i>	Is the home directory of the boot file.
<i>boot-file</i>	Is the name of the boot file that points to the binary image of the firmware.

Note that if the IP address has already been assigned by other methods (for example, using the `set_download_info` or `set_ip_address` commands), specifying the hardware address and the IP address for the module in the `/etc/bootptab` entry might cause unpredictable results.

Make sure the home directory reflects the TFTP path and directory specified in the `etc/inetd.conf` file. The home directory is found on the local host.

For example, a switch node named `atm5` with Ethernet address `08-00-2B-12-34-56` and IP address `16.20.111.222` would have the following entry in the `etc/bootptab` file:

```
atm5:ht=1:ha=08002B123456:ip=16.20.111.222:hd=/tftpboot:bf=A900R10
```

## Setting Up the Servers

The control file is located in the `tftpboot` directory by default and contains pointers to the image files. You must modify the control file if you change the file names or the directory. Uppercase file names are used for compatibility with DOS. You can rename the files with lowercase file names if your BootP server supports lowercase file names.

---

Step	Action								
1	See if the <code>tftpboot</code> directory exists. If it does not exist, follow the instructions for setting up the TFTP server. Verify that the directory specified by the boot file is <code>/tftpboot</code> and that the specified control file exists in this directory.								
2	Modify the local <code>/etc/hosts</code> file to include the workstation and ATMswitch 900 module information for the module. The <code>/etc/hosts</code> file might list the ATMswitch 900 module as follows: <table><thead><tr><th>Inet Addr</th><th>Host Name</th><th>Full inet name</th><th>Comments</th></tr></thead><tbody><tr><td>16.17.18.19</td><td>an29</td><td>atm31.nac.lkg.dec.com#</td><td>ATMswitch 900F</td></tr></tbody></table>	Inet Addr	Host Name	Full inet name	Comments	16.17.18.19	an29	atm31.nac.lkg.dec.com#	ATMswitch 900F
Inet Addr	Host Name	Full inet name	Comments						
16.17.18.19	an29	atm31.nac.lkg.dec.com#	ATMswitch 900F						
3	Apply power to the ATMswitch 900 module to verify that the BootP server can respond to downline load requests. Determine the directory with the latest time-stamp from the directory listing of <code>/usr/adm/syslog.dated</code> using the <code>ls</code> command. Determine if there is a <code>daemon.log</code> file in the directory with the latest time-stamp using the <code>ls /usr/adm/syslog.dated/latest-date</code> command, where <code>latest-date</code> is the directory with the latest time-stamp from the preceding command. If there is a <code>daemon.log</code> file, then you can verify that the BootP requests are coming from the target ATMswitch 900 module by using the <code>tail -f /usr/adm/syslog.dated/latest-date/daemon.log</code> command.								
4	Confirm that the host address in the <code>/etc/hosts</code> file is correct and that the ATMswitch 900 module can receive the correct IP address through the BootP server by executing the command: <pre>#ping ip-addr</pre> where <code>ip-addr</code> is the IP address of the ATMswitch 900 module. Press the <code>&lt;Ctrl/C&gt;</code> key sequence to end the display.								
5	Create a remote connection to the console for the ATMswitch 900 module using the following command: <pre>#telnet ip-addr</pre> where <code>ip-addr</code> is the IP address for the ATMswitch 900 module. Your host must be on the network. The <code>help</code> command displays information about available console commands. Use the <code>logout</code> command to end the remote connection. Refer to <i>ATMswitch 900 Management</i> for more information about other console commands.								

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# Appendix C

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## Product Specifications

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### Overview

#### Introduction

This appendix lists the specifications and available parts for the ATMswitch 900 modules.

#### In This Appendix

Topic	Page
Product Specifications	C-2
Acoustical Specifications	C-4
Connectors	C-6

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## Product Specifications

Table C-1 lists the product specifications for the ATMswitch 900F module.

**Table C-1: ATMswitch 900F Product Specifications**

Parameter	Specification
Operating Temperature <sup>1</sup>	5°C to 50°C (41°F to 122°F)
Relative Humidity	10% to 95% noncondensing
Altitude	
• Operating	Sea level to 2400 m (8,000 ft)
• Nonoperating	Sea level to 4900 m (16,000 ft)
Power	74.0 W, total power 12.9 A, 5 Vdc 0 A, 12 Vdc (derived from 15 Vdc) 0.63 A, 15 Vdc
Height	44.45 cm (17.5 in)
Width	4.45 cm (1.75 in)
Depth	15.25 cm (6.0 in)
Weight	1.94 kg (4.25 lb)
Shock (Class A/B for products weighing under 100 lb)	10 G / 10 ms half sine pulse in three orthogonal axes
Vibration (Class C)	5 to 200 Hz sine sweep @ 0.25 G limited by 0.02 in (0.5 mm) displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
Certification	CE, CSA, FCC, TÜV, UL, VCCI

<sup>1</sup> For sites above 2400 m (8,000 ft), decrease the operating temperature specification by 1.8°C for each 1000 m or 3.2°F for each 3,200 ft.

## Product Specifications

Table C-2 lists the product specifications for the ATMswitch 900T module.

**Table C-2: ATMswitch 900T Product Specifications**

Parameter	Specification
Operating Temperature <sup>1</sup>	5°C to 50°C (41°F to 122°F)
Relative Humidity	10% to 95% noncondensing
Altitude	
• Operating	Sea level to 2400 m (8,000 ft)
• Nonoperating	Sea level to 4900 m (16,000 ft)
Power	74.0 W, total power 12.9 A, 5 Vdc 0 A, 12 Vdc (derived from 15 Vdc) 0.63 A, 15 Vdc
Height	44.45 cm (17.5 in)
Width	4.45 cm (1.75 in)
Depth	15.25 cm (6.0 in)
Weight	1.94 kg (4.25 lb)
Shock (Class A/B for products weighing under 100 lb)	10 G / 10 ms half sine pulse in three orthogonal axes
Vibration (Class C)	5 to 200 Hz sine sweep @ 0.25 G limited by 0.02 in (0.5 mm) displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
Certification	CE, CSA, FCC, TÜV, UL, VCCI

<sup>1</sup> For sites above 2400 m (8,000 ft), decrease the operating temperature specification by 1.8°C for each 1000 m or 3.2°F for each 3,200 ft.

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## Acoustical Specifications

Table C-3 lists the acoustical specifications for the modules.

**Table C-3: Acoustical Specifications**

**Declared Values per ISO 9296 and ISO 7779<sup>1</sup>**

<b>Product</b>	<b>Sound Power Level <math>L_{WA,d}</math>, B</b>	<b>Sound Pressure Level <math>L_{pA,m}</math>, dBA (bystander positions)</b>
	<b>Idle/Operate</b>	<b>Idle/Operate</b>
ATMswitch 900F (DAHSE-MA)	5.7	42
ATMswitch 900F (DAHSE-MA) & DEChub ONE-MX (DEF1H)	5.8	43
ATMswitch 900F (DAHSE-MA) & DEChub ONE (DEHUA)	5.8	43
ATMswitch 900T (DAHST-MA)	5.7	42
ATMswitch 900T (DAHST-MA) & DEChub ONE-MX (DEF1H)	5.8	43
ATMswitch 900T (DAHST-MA) & DEChub ONE (DEHUA)	5.8	43

<sup>1</sup> Current values for specific configurations are available from Digital Equipment Corporation representatives. 1 B = 10 dBA.



## Acoustical Specifications

Table C-4 lists the German acoustical specifications for the modules.

**Table C-4: German Acoustical Specifications**

**Schallemissionswerte Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779<sup>1</sup>**

<b>Gerät</b>	<b>Schalleistungspegel <math>L_{WA,d, B}</math></b>	<b>Schalldruckpegel <math>L_{pAm, dBA}</math> (Zuschauerpositionen)</b>
	<b>Leerlauf/Betrieb</b>	<b>Leerlauf/Betrieb</b>
ATMswitch 900F (DAHSF-MA)	5,7	42
ATMswitch 900F (DAHSF-MA) & DEChub ONE-MX (DEF1H)	5,8	43
ATMswitch 900F (DAHSF-MA) & DEChub ONE (DEHUA)	5,8	43
ATMswitch 900T (DAHST-MA)	5,7	42
ATMswitch 900T (DAHST-MA) & DEChub ONE-MX (DEF1H)	5,8	43
ATMswitch 900T (DAHST-MA) & DEChub ONE (DEHUA)	5,8	43

<sup>1</sup> Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich.  
1 B = 10 dBA.

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## Connectors

For modular PHY interface connectors, refer to the *ATM Modular PHY Cards Installation* manual.

The following table describes the cable and connector specifications for the fixed ports:

Topic	Page
MMF Cables	C-6
Twisted-Pair Cables	C-7

## MMF Cables

The ATMswitch 900F module uses the following MMF cables, which are available from DIGITAL:

Cable Description	Order Number
ST-SC, MM, Dual Fiber-Optic Cables	BN34A- <i>xx</i>
SC-SC, MM, Dual Fiber-Optic Cables	BN34B- <i>xx</i>

where *xx* represents the cable length. The available cable lengths are described in the *OPEN DECconnect Applications Guide*.

## Cable Specifications

The MMF cables should adhere to these specifications:

- EIA/TIA 492-AAAA
- 62.5/125  $\mu\text{m}$
- SC connector
- 0 through 2 km
- 0 through 9 dB loss at 1300 nm (UNI V3.1, ATM User-Network Interface Specification)

or

0 through 11 dB loss at 1300 nm (ANSI X3.166-1990, FDDI PMD)

### Interface Specifications

The fixed multimode fiber ports adhere to the following optical specifications:

- Transmit power level, -20 dbm minimum
- Receive power level, -31 dbm minimum

### Loopback Connectors

The H4085-AA loopback connector is an optional product available from DIGITAL.

### Twisted-Pair Cables

The ATMswitch 900T module uses twisted-pair cables. Information about unshielded twisted-pair (UTP) and screened twisted-pair (ScTP) cables is provided in this section.

### UTP Cables

The following UTP cables are available from DIGITAL:

Cable Description	Order Number
UTP High-Performance Data Grade Building Cables (TIA/EIA Category 5)	H8245-C and H8246-C series
UTP Category 5 Patch Cord	BN25H-xx

where *xx* represents the cable length. The available cable lengths are described in the *OPEN DECconnect Applications Guide*.

BN25H contains a crossover and can be used to directly connect two ATM devices in close proximity. Refer to the *OPEN DECconnect Applications Guide* for information about installed wiring and other configurations.

## Connectors

## ScTP Cables

The following ScTP cables are available from DIGITAL:

<b>Cable Description</b>	<b>Order Number</b>
Screened Twisted-Pair High-Performance Data Grade Building Cables (TIA/EIA Category 5)	H8245-D and H8246-D series
ScTP Category 5 Patch Cord	BN26S-xx

where *xx* represents the cable length. The available cable lengths are described in the *OPEN DECconnect Applications Guide*.

## Cable Specifications

The UTP and ScTP cable plant must meet the requirements of EIA/TIA 568B for a Category 5 twisted-pair installation. See the *OPEN DECconnect Applications Guide* for more information.

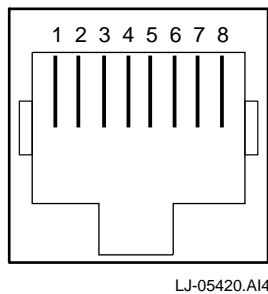
Note that EIA/TIA 568B requirements are typically met with:

- 295 ft (90 m) of Category 5 building cable
- 33 ft (10 m) of Category 5 patch cords
- 1 punchdown block (Category 5)

## Interface Specifications

Figure C-1 and the associated table provide information about the modular jack (MJ) pin assignments.

**Figure C-1: MJ Pin Assignments for ATM UTP and ScTP Cables**



Contact	Pin Assignment
1	Receive +
2	Receive -
3	Isolated from chassis at low frequency
4	Isolated from chassis at low frequency
5	Isolated from chassis at low frequency
6	Isolated from chassis at low frequency
7	Transmit +
8	Transmit -

## Loopback Connectors

For UTP and ScTP, the H4082-AC loopback connector is an optional product available from DIGITAL.

