

# PORTswitch 900TP/12

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## Installation and Configuration

Part Number: EK-DETPX-IN. A01

March 1997

This manual explains how to install and configure the PORTswitch 900TP/12.

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# Preface

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## Overview

### Purpose of This Document

This manual describes how to install and set up the PORTswitch 900TP/12 module. It also provides problem solving, connector, adapter, and pin assignment information.

### Intended Audience

This manual is intended for use by personnel who will install and set up the PORTswitch 900TP/12.

## Organization

This manual is organized as follows:

<b>Section</b>	<b>Description</b>
1	Provides an overview of the PORTswitch 900TP/12 and describes its features.
2	Provides instructions for installing the module in a DEChub 900 MultiSwitch.
3	Provides information for installing the setup port cable.
4	Provides information for configuration the module in a DEChub ONE.
5	Provides information for configuring the module in a DEChub 900 MultiSwitch.
6	Provides information for removing the module from a DEChub 900 MultiSwitch.
7	Provides information about redundant-link configuration.
A	Provides installation-specific problem solving information using the LEDs
B	Provides connector and pin assignment information.
C	Provides product specifications.
D	Provides instructions for accessing the RMON groups.

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## Conventions

This book uses the following conventions:

<b>Convention</b>	<b>Description</b>
<i>Special Type</i>	Indicates system output in examples.
<b>Boldface</b>	Indicates user input in examples and emphasis in the text.
<Return>	Indicates that you should press the Return key.

## Associated Documents

The following documents provide information relating to the module. To order any of the following 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>Ethernet Switch Enterprise RMON Upgrade Configuration</i> AA-QXWAA-TH	Provides information for installing and configuring full RMON firmware upgrade that supports all nine RMON groups plus additional proprietary RMON MIBs.
<i>DEChub 900 MultiSwitch Owner's Manual</i> EK-DH2MS-OM	Provides installation, use, security, and troubleshooting information for the DEChub 900 MultiSwitch.
<i>DEChub ONE Installation</i> EK-DEHU2-IN	Provides installation and operation guidelines for standalone module configuration, including mounting options and cabling.
<i>DEChub ONE-MX Installation</i> EK-DEF1H-IN	Provides installation and operation guidelines for standalone module configuration, including mounting options and cabling.
<i>clearVISN Installation</i>	Describes how to install clearVISN software. It includes a list of distribution kit contents, system requirements, pre-installation considerations, and the installation procedure.
<i>clearVISN Overview</i>	Provides an overview of clearVISN, an explanation of each clearVISN application, and descriptions of all concepts necessary to understand and use the application efficiently.
<i>clearVISN User's Guide</i>	Provides information for starting each application, configuring them (when necessary), and general use information.
<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.

## Associated Documents

<b>Title and Order Number</b>	<b>Description</b>
<i>DEChub Network Modules 900-Series Switch Reference</i> EK-SWTCH-HR	Describes the functions and features of Digital's HUB based 900-Series switching products.
<i>Bridge and Extended LAN Reference</i> EK-DEBAM-HR	Describes how bridges are used to create extended local area networks (LANs). This includes the use of bridges in extended LAN configurations, information on LAN interconnections, overall bridge operation, spanning tree, and solving bridge-related problems in a network.

Correspondence

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## Correspondence

### Documentation Comments

If you have comments or suggestions about this document, send them to the Network Products Business Organization.

ATTN: Documentation Project Manager  
FAX: (508) 486-6093  
E-MAIL: doc\_feedback@lkg.mts.dec.com

### 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 located 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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## 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	U.S.A. (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 (U.S.A. only)	Dial 1-800-DEC-DEMO (For assistance, call 1-800-DIGITAL)
By Mail (U.S.A. 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

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## Overview

The cautions that must be observed for the hardware described in this manual are listed in English, German, French, and Spanish. Any warning or caution that appears in this manual is defined as follows.

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

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<b>CAUTION</b>	This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost.
<b>ACHTUNG</b>	Bei diesem Vorgang werden alle Konfigurationseinstellungen gelöscht und die Werkseinstellungen wieder eingesetzt. Alle Konfigurationsdaten gehen verloren.
<b>ATTENTION</b>	Cette action supprime tous les paramètres de configuration et les remplace par des valeurs prédéfinies. Tous les paramètres de configuration seront perdus.
<b>PRECAUCIÓN</b>	Esta intervención borrará todos los parámetros de configuración y los sustituirá por valores por defecto definidos de fábrica. Se perderán todos los parámetros de configuración.

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<b>CAUTION</b>	If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.
<b>ACHTUNG</b>	Solite während der Phase 3 des DLU-Prozesses eine Unterbrechung der Stromversorgung eintreten, kann das Firmwareprogramm zerstört werden. Aus diesem Grunde wird dringend empfohlen, Vorkehrungen zu treffen, daß während der Durchführung dieser Phase 3 die Systemeinheit weder ausgeschaltet noch die Stromversorgung unterbrochen werden kann.
<b>ATTENTION</b>	L'image du microprogramme risque d'être corrompue, en cas de coupure de courant au cours de l'étape 3 du processus DLU. Ne mettez pas l'unité hors tension et n'exécutez aucune action risquant d'entraîner une coupure d'alimentation au cours de cette étape.
<b>PRECAUCIÓN</b>	Si se interrumpe el suministro eléctrico durante la Etapa 3 del proceso DLU, puede dañarse la imagen del firmware. No se debe apagar la unidad ni realizar ninguna operación que pueda causar una interrupción del suministro de la unidad durante la Etapa 3 del mencionado proceso.

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# Chapter 1

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## Product Introduction

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### Overview

#### Introduction

This chapter describes the features of the PORTswitch 900TP/12.

#### In This Chapter

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What Is the PORTswitch 900TP/12?	1-2
Features	1-3

What Is the PORTswitch 900TP/12?

---

## What Is the PORTswitch 900TP/12?

The PORTswitch 900TP/12 (also referred to in this manual as the module) is a port-switchable, 32-port, 10BaseT Ethernet repeater. It features advanced management and configuration control.

The PORTswitch 900TP/12 provides the flexibility to logically interconnect any combination of externally accessible ports onto any of the twelve internal LAN segments. This level of configuration control provides flexibility across all of the 32 ports. You can also enable the twelve internal LANs onto the DEChub 900 flexible backplane channels to give further global expansion of the network through other DEChub networks.

The PORTswitch 900TP/12 enforces eavesdrop prevention and intrusion protection based on the Ethernet MAC addresses of attached stations. It uses access control lists to map authorized addresses to manageable PORTswitch ports. You can enable either or both of these features per port.

You can install and configure the module in a DEChub 900 MultiSwitch (also referred to in this manual as a DEChub 900) or as a standalone unit in a DEChub ONE or DEChub ONE-MX docking station (see the *DEChub ONE Installation* manual or the *DEChub ONE-MX Installation* manual).

The PORTswitch 900TP/12 does not support the FDDI features of the DEChub ONE-MX.

The term Ethernet is Digital's term for its product compatibility with the ISO 8802-3/ANSI/IEEE 802.3 standards and the Ethernet standards for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) local area networks (LANs).

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## Features

This section describes features of your PORTswitch 900TP/12 module.

### Hot Swap

The module's hot swap capability allows you to install or remove the module from a DEChub 900 without turning off the hub's power.

### Configuration and Management

The module offers the following configuration and management options:

- Upgradeable device firmware (in nonvolatile Flash memory) using Trivial File Transfer Protocol (TFTP) with Flash Loader or through the setup port with any TFTP server.
- Configurable rate limiting of multicast packets to limit the spread of multicast and broadcast storms.
- Out-of-Band Management (OBM), using Simple Network Management Protocol (SNMP) over Serial Line Internet Protocol (SLIP) through the OBM connector on the DEChub 900 or the DEChub ONE, in addition to in-band management.
- Advanced Graphical User Interface (GUI) manageability with Digital's clearVISN MultiChassis Manager application.

### Ethernet

The module offers the following Ethernet options:

- Thirty-two 802.3/Ethernet LAN ports that are individually switchable to a DEChub 900 backplane LAN through MultiChassis Manager management.
- When connected to a DEChub ONE docking station (DEF1H or DEHUA), a user has the option of configuring either the DEChub ONE's AUI port or the PORTswitch 900TP/12's front panel as an active Ethernet Interface.

## Features

### Per-port Security

The module offers the following two security features:

- Eavesdrop Prevention
  - When enabled, this feature prevents unauthorized monitoring of network traffic. Only packets destined for authorized stations are transmitted on the port.
- Intrusion Protection
  - When enabled, this feature prevents unauthorized stations from successfully transmitting data into a PORTswitch port. The PORTswitch compares the source address of the packets received on a port to the list of authorized addresses assigned to that port. If the addresses do not match, the PORTswitch logs an intrusion violation and can take one of the following actions:
    - Converts the remainder of this packet to a jam pattern as it is repeated.
    - Disables the port that detected the violation.

## SNMP

Manageability using any generic SNMP management application that supports the management information bases (MIBs) listed below:

- Built-in SNMP agent support for the following porticoes:
  - Remote MONitoring (RMON) alarms and events (RFC 1271)
  - Internet Engineering Task Force (IETF) Repeater (RFC 1516)
  - Ethernet-like Interface Type MIB (RFC 1398)
  - DEChub 900 Public Common
  - MIB II (RFC 1213)
  - Digital Extended Repeater

### Remote MONitoring (RMON)

The PORTswitch 900TP/12 supports sophisticated Ethernet monitoring with the Remote Network Monitoring Information Base (RMON-MIB). The following RMON features and options are available:

- RMON functions are performed concurrently with the switching function.
- Multiple RMON monitors within the switch (one for each Ethernet) are accessible by multiple managers.



## Features

- Basic RMON capability at the LAN level for the following groups:
  - Statistics — Various statistics measured by the probe for the monitored Ethernet, including utilization, packet rates, broadcast and multicast rates, and error information
  - History — Capturing of periodic statistical samples for later retrieval and analysis by the manager
  - Alarms — Specification of thresholds for various monitored variables to generate events
  - Events — Controls the generation and notification of events from the probe
- GUI Management with clearVISN RMON Manager/ProbeWatch

The following two features are optional upgrades. For more information about these features, refer to *Ethernet Switch Enterprise RMON Upgrade Configuration*.

- Enhanced RMON capability for the following five groups of the standard RMON MIB:
  - Host Table — Statistics by specific MAC address.
  - Host Top N — Statistics for the top N addresses, ordered by one of their statistics.
  - Traffic Matrix — Traffic patterns between pairs of nodes.
  - Filters — A set of user-defined preconditions for packet capture or events.
  - Packet capture — Stores packets that meet the filter criteria for later retrieval. Allows examination of individual packets or sequence of packets to help identify and isolate problems.
- RMON capability for a variety of network protocols and applications

For information on how to access and use the basic RMON features, refer to Appendix D.



## Chapter 2

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# Installing the Module in a DEChub 900

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### Overview

#### Introduction

This chapter tells you how to install the PORTswitch 900TP/12 module in a DEChub 900 MultiSwitch. To install the module in a DEChub ONE or DEChub ONE/MX, refer to the installation manuals for these products.

#### In This Chapter

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Module Components	2-2
How to Install the Module	2-6

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## Module Components




### Introduction

The following sections describe the front and back panel components for the PORTswitch 900TP/12. For problem-solving information using the LEDs, refer to Appendix A.

### Front Panel Components

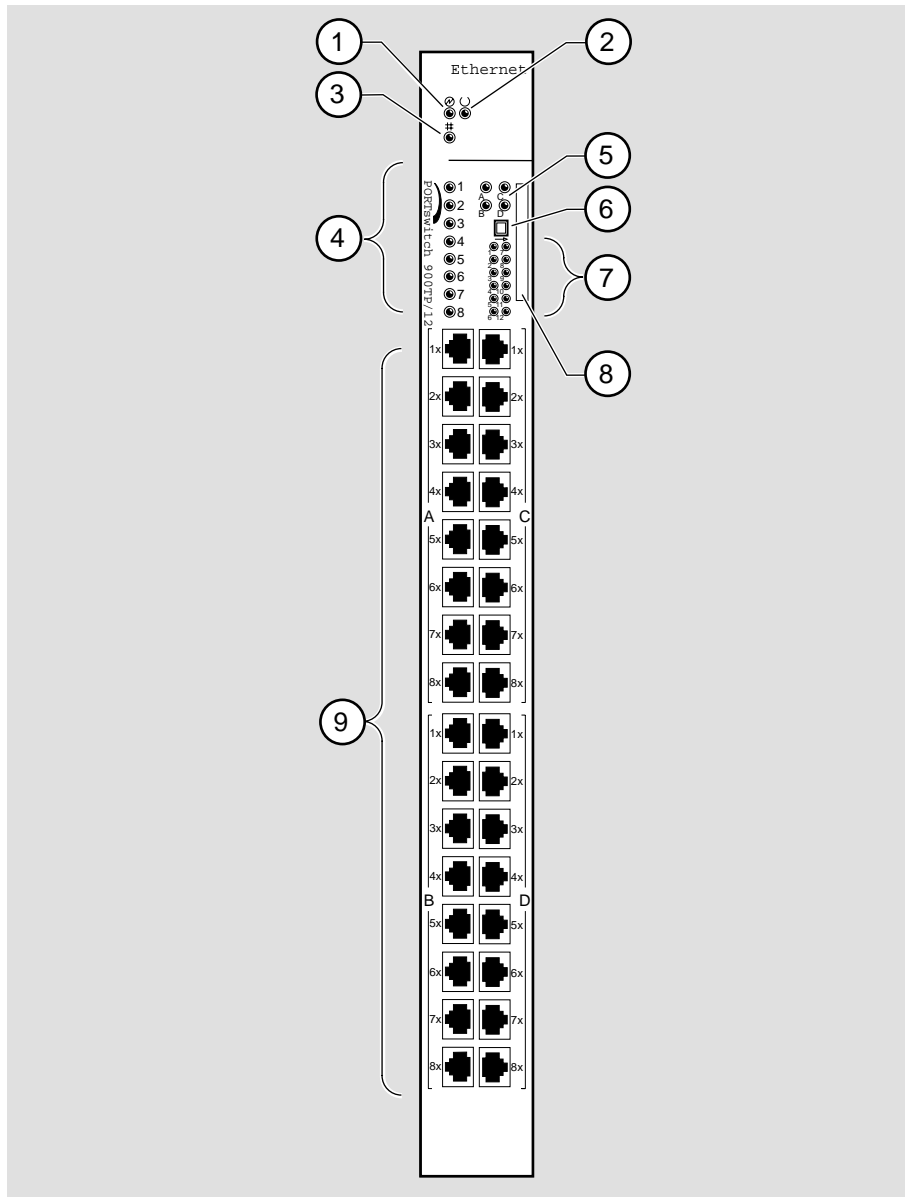
Table 2-1 describes the front panel components that are illustrated in Figure 2-1.

**Table 2-1: Front Panel LEDs and Connectors**

Item	Icon	Name	Description
1		Power LED	Lights when the module has power.
2		Module OK LED	Lights when the module passes self-test.
3		Network OK LED	Indicates the status of the backplane ThinWire port on the DEChub 900 or of the AUI port on the DEChub ONE.
4	1–8	Port State LEDs	Shows the status of one of the four banks of ports, depending on the state of the bank indicator LEDs.
5	A–D	Bank Indicator LEDs	Light one at a time for a few seconds, indicating which bank of ports is currently displaying its status on the eight port state LEDs.
6		Momentary LED cycle switch	Enables you to stop and start the LED status scanning of the bank indicator LEDs during operation.
7	1–12	Internal LAN LEDs	Indicates which internal LANs have activity and the level of network traffic on each of those LANs.
8		Address label	Contains the module's 48-bit Ethernet hardware address.
9		10BaseT (8-pin MJ) port connectors	8-pin MJ connectors for ports 1 to 32 support both UTP and ScTP cabling.

## Module Components

Figure 2-1: Front Panel LEDs and Connectors



NPB-0001-95F

## Module Components

### Back Panel Components

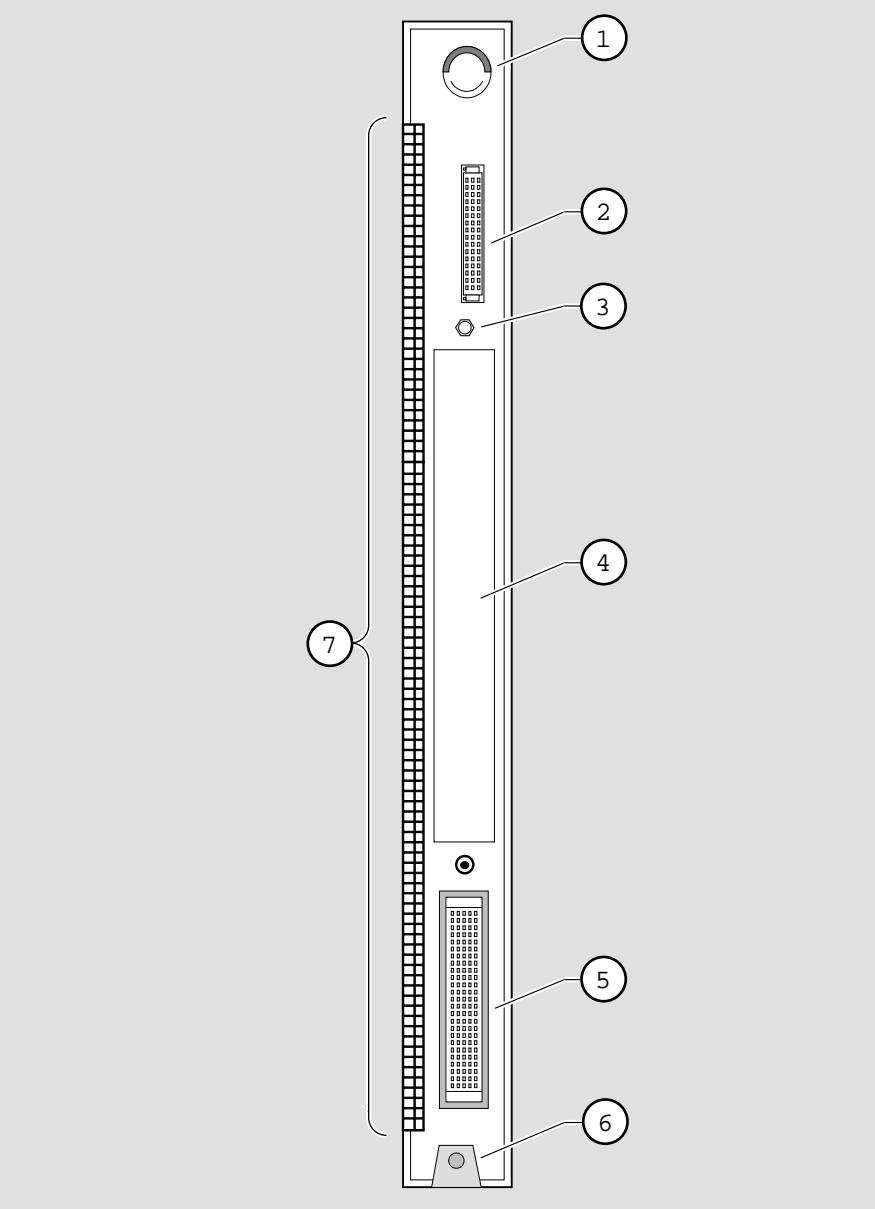
Table 2-2 describes the back panel components that are illustrated in Figure 2-2.

**Table 2-2: Back Panel Components**

Item	Name	Description
1	Locking tab	Locks the module into a DEChub 900 backplane or into a DEChub ONE docking station.
2	48-pin connector	Provides network and power connections to the module when the module is installed into a DEChub 900 or DEChub ONE docking station.
3	Grounding bolt	Provides a chassis grounding connection to the module when the module is installed into a DEChub 900 MultiSwitch or a DEChub ONE docking station.
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 docking station.
6	Mounting tab	Secures the module to the backplane when the module is installed into a DEChub 900 or a DEChub ONE docking station.
7	Grounding fingers	Provide additional chassis grounding between the module and a DEChub 900 or a DEChub ONE docking station.

Module Components

Figure 2-2: Back Panel Features



NPG-8709-95F

---

## How to Install the Module

The hot-swap feature allows you to install the module into the DEChub 900 without turning off the hub's power. Seating the module initiates the module's powerup sequence if enough power is available.

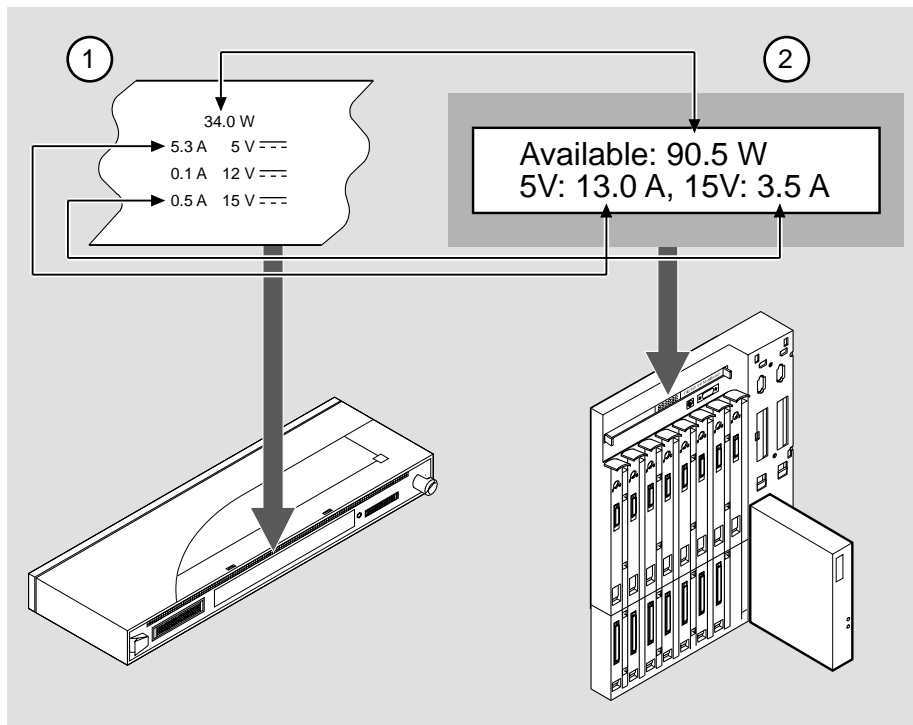
To install the module, complete the following tasks:

### Task 1: Compare the Power Ratings

Compare the module's power ratings (1) with the values shown in the Hub Manager Status display (2) (see Figure 2-3).

If any of the module's power requirements exceed the values shown in the status display, add another power supply (see the *DEChub 900 MultiSwitch Owner's Manual*).

**Figure 2-3: Power Ratings**



NPB-0778-97F



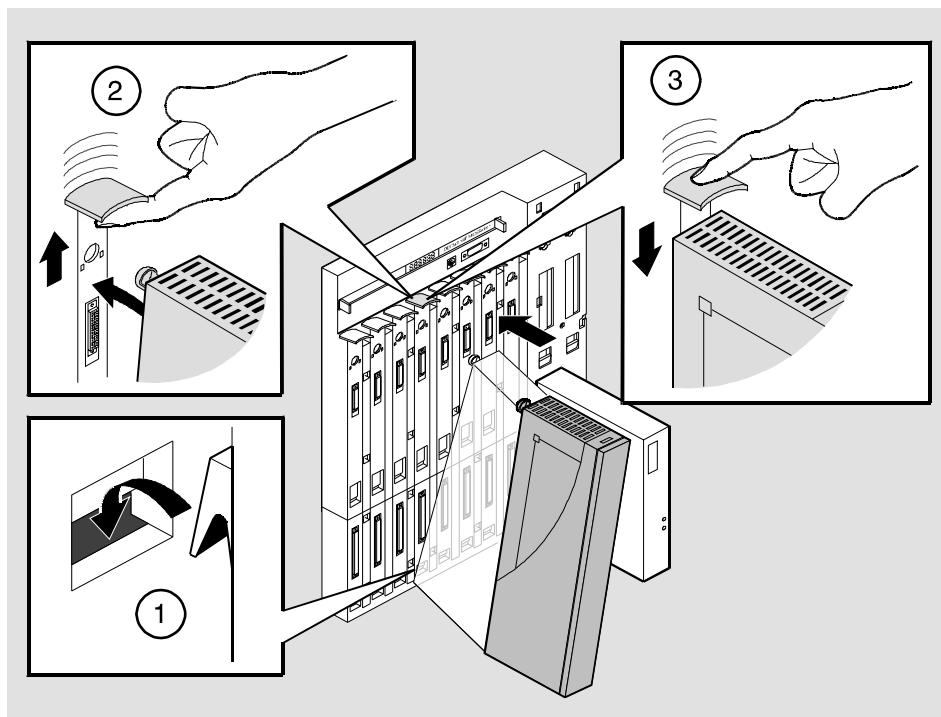
## How to Install the Module

### Task 2: Seat the Module

To seat the module into the DEChub 900 MultiSwitch, complete the following steps (see Figure 2-4):

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

Figure 2-4: Seating the Module



NPG-0004-95F

## How to Install the Module

### Task 3: Verify Initial LED Operation

If this is a new installation, turn on the power to the DEChub 900 MultiSwitch. If the module was installed while the DEChub 900 was powered up, seating the module will initiate the module's power up sequence. For locations of the module's LEDs, refer to Figure 2-1.

Verify that the module's Power LED and the Module OK LED light within 1 minute. The LEDs light in the following stages:

---

Stage	Description
1	The Power LED lights when power is applied to the DEChub 900, then the module performs a self-test. <u>Note:</u> The self-test should complete in a few seconds.
2	After the module completes self-test, the Module OK LED becomes lit. Then the Hub Manager status identifies the module as a PORTsw 900TP/12.

---

---

#### NOTE

If the LEDs do not operate as described, refer to Appendix A, Problem Solving.

---

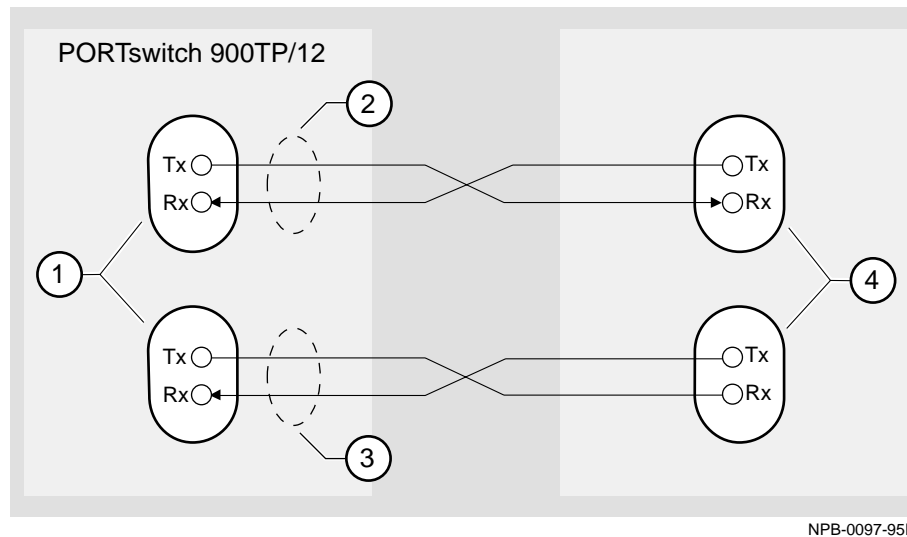
## Task 4: Configure the Ports

Determine whether you are configuring the ports as redundant-link pairs (RLP), separate independent ports (default configuration). Refer to Figure 2-5.

If you are configuring the ports as RLP, refer to Chapter 7 in this book or to the clearVISN Online Help for more information.

After you have configured RLP, or if you are using the default configuration (separate independent ports), refer to Task 5 for information about cables.

**Figure 2-5: Redundant-Link Configuration**



Item	Description
1	Master port pair
2	Primary link
3	Secondary link
4	Single responder ports, nonresponder ports, or a combination. These ports can reside on one module (as shown in Figure 2-5) or on separate modules.

## How to Install the Module

After you have configured the ports as RLP, using clearVISN, complete the following steps:

---

<b>Step</b>	<b>Action</b>
<b>1</b>	Identify the port that you have assigned as the primary and secondary master port pair and the ports that you have assigned as responder or nonresponder ports (see Chapter 7).
<b>2</b>	Connect the UTP/ScTP cables to the primary master port.
<b>3</b>	Connect the other end of the port cables to the primary responder or nonresponder port.
<b>4</b>	Connect another 10BaseT port cable to the secondary master port.
<b>5</b>	Connect the other end of the cable to the secondary responder or nonresponder port.
<b>6</b>	Repeat steps 1 through 5 for all the remaining RLP ports.

---

---

### **NOTE**

You must configure the links using clearVISN before connecting.

---

## How to Install the Module

### Task 5: Connect the UTP/ScTP Cable

The PORTswitch 900TP/12 module uses crossover 10BaseT 8-pin MJ port connectors. Select the appropriate UTP/ScTP cable type, crossover or straight-through, to ensure that the module's transmit/receive signals connect correctly to the transmitter/receiver of the connected device.

Before connecting the cables to the module, note the following rules:

<b>If the device you are connecting to the module uses ...</b>	<b>Then use ...</b>
Straight-through connectors <sup>1</sup>	Straight-through cables
Crossover connectors <sup>2</sup>	Crossover cables

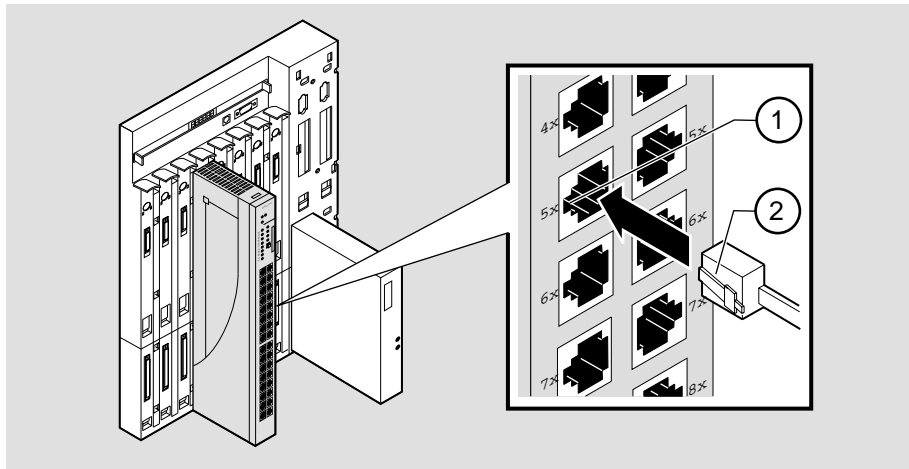
<sup>1</sup> Digital's straight-through cables are marked (=); crossover connectors (and cables) are marked (X).

<sup>2</sup> The sum of crossovers must always equal an odd number.

If you need help determining the appropriate cable type to use, refer to Appendix B.

## How to Install the Module

**Figure 2-6: UTP/ScTP Cable Connection**



NPG-0007-95F

To connect the UTP/ScTP cables, complete the following steps:

Step	Action
1	Align the release tab on the cable plug (1) with the keyway on the module's 10BaseT port connector.
2	Insert the plug into the connector (2), ensuring that the release tab snaps into the locked position.

After 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 PORTswitch 900TP/12 module to the setup port on a DEChub 900 MultiSwitch or a DEChub ONE docking station.

#### In This Chapter

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

## 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. To the user, 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 setup port device (a terminal or personal computer), 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

---

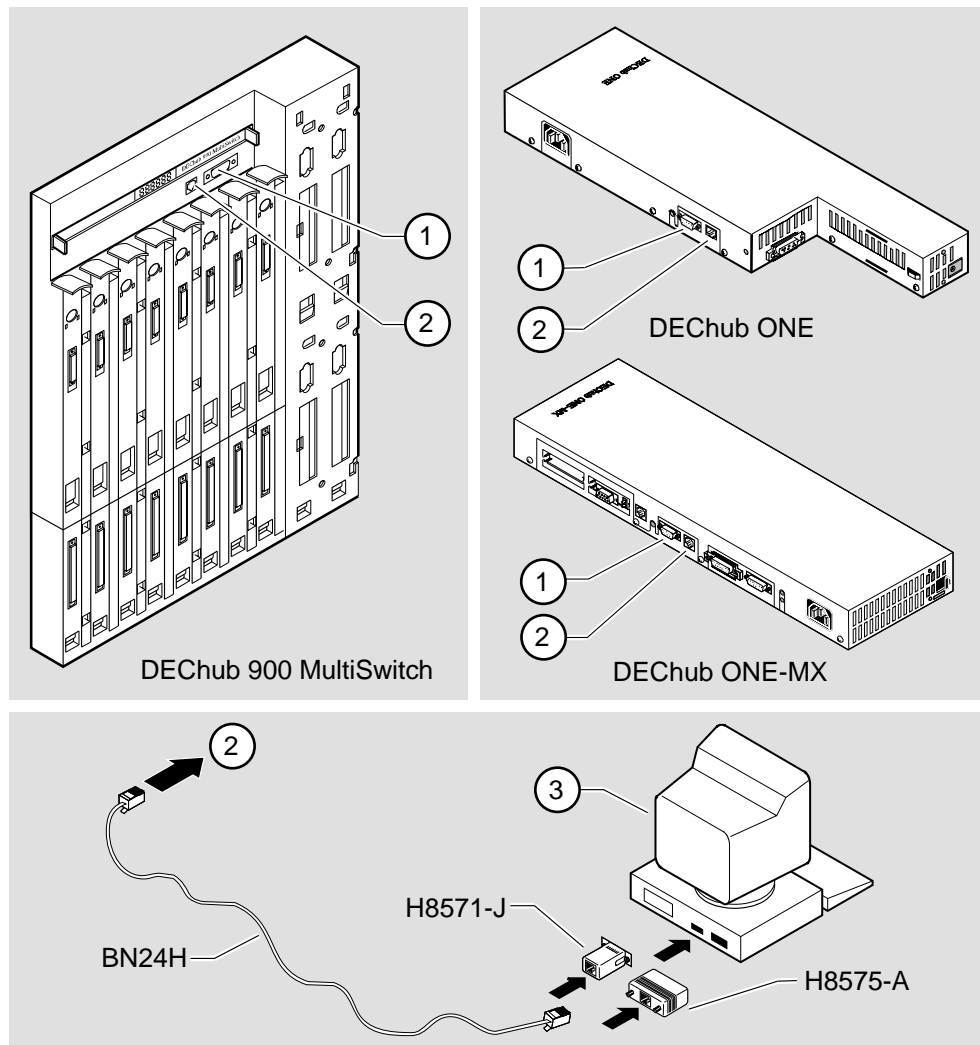
### Connecting the Setup Port

To connect the setup port on the module, complete the following steps:

<b>Step</b>	<b>Action</b>
<b>1</b>	Ensure that the transmit and receive baud rates on the setup port device are set to 9600 baud.
<b>2</b>	Connect the setup port device to the setup port connector on either the DEChub 900 MultiSwitch or the DEChub ONE docking station.

## Connecting the Setup Port

**Figure 3-1: Setup Port Cabling Components**



NPG-0020-95F

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

Item	Description
1	OBM Port
2	Setup Port
3	Setup Port Device



## Chapter 4

---

# Configuring the Module in a DEChub ONE

---

### Overview

#### Introduction

This chapter describes how to configure your PORTswitch 900TP/12 when it is installed in a DEChub ONE docking station.

#### In This Chapter

Topic	Page
Accessing the Setup Port	4-2
Using Menus to Configure the Module	4-3
[1] Restart with Factory Defaults	4-4
[2] Restart with Current Settings	4-5
[3] Show Current Settings	4-6
[4] Configure IP	4-7
[5] Dump Error Log	4-14
[6] Downline Upgrade	4-15
[7] Configure Out-of-Band Port	4-22
[8] Product-Specific Options	4-23

## Accessing the Setup Port

To configure your module and make it remotely accessible, assign:

- An IP address
- A subnet mask
- A default gateway

The setup port provides menus that allow you to access the PORTswitch 900TP/12. These menus allow you to set up the module for basic connectivity. After setup, you can configure the module's software using commands. You can access these commands remotely via TCP/IP Telnet, or locally through the setup port on a DEChub ONE docking station.

This chapter provides examples of the setup screens to help describe the setup port and to display the options that are available. Because they are examples only, the displays can vary slightly from the actual screens on your setup port device. Boldface type in the screen examples indicates user input.

To access the configuration menus, press <Return> on the setup port device until the PORTswitch 900TP/12 MAIN INSTALLATION MENU appears.

---

## Using Menus to Configure the Module

This section describes the options that are available from the PORTswitch 900TP/12 MAIN INSTALLATION MENU when the module is installed in the DEChub ONE docking station.

The following example shows the dialog associated with these options when the module is configured with factory defaults.

```
PORTsw 900TP/12 MAIN
=====
          PORTsw 900TP/12 INSTALLATION MENU
[1] Restart with Factory Defaults
[2] Restart with Current Settings
[3] Show Current Settings
[4] Configure IP
[5] Dump Error Log
[6] Downline Upgrade
[7] Configure Out-of-Band Port
[8] Product-Specific Options...
=====
Enter selection: [n] <Return>
```

[1] Restart with Factory Defaults

---

## [1] Restart with Factory Defaults

This option initializes the module's configuration to factory default values by resetting the module's nonvolatile configuration storage parameters and restarting the module. (To keep the configured setup, use Option 2.) Allow approximately one minute for the module to restart and complete self-test.

---

### CAUTION

This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost.

---

The following example shows the dialog associated with this option:

```
Enter selection : 1
PORTsw 900TP/12
=====
                RESTART WITH FACTORY DEFAULTS
* * * * *
*           IMPORTANT!   IMPORTANT!   IMPORTANT!           *
* * * * *
* This selection will delete the current configuration      *
* settings and reset the system with the factory default  *
* settings. All configuration settings will be lost.      *
* * * * *
=====
Press Y to confirm [N]:  Y <Return>
Press Return for Main Menu...
```



## [2] Restart with Current Settings

---

### [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 one minute for the module to restart.

The following example shows the dialog associated with this option:

```
Enter selection: 2
PORTsw 900TP/12
=====
                RESTART WITH CURRENT SETTINGS
This selection will reset your system with the current
configuration settings.
=====
                Press Y to confirm [N] : Y <Return>
                Press Return for Main Menu...
```

[3] Show Current Settings

---

## [3] Show Current Settings

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

The following example shows the display associated with this option:

```
Enter selection : 3
PORTsw 900TP/12
=====
PORTswitch 900TP/12, 32-Ethernet Rptr SNMP, HW=v1/2, RO=v0.4,SW=v1.6
SysUpTime           : 6days 00:03:18 18 resets
SNMP Read/Write community : public
SNMP Trap Addresses  : 16.7.88.156
Status of Last Downline Upgrade : TFTP Read
                                00:02:55 27 resets
                                Transfer Complete
BootP                : Disabled
Interface   IP Address  Subnet Mask  Def Gateway  Other Info
Ethernet Port 16.20.216.91 255.255.255.0 16.21.0.1 8-00-2B-A6-0E-05
=====
Press Return for Main Menu . . .
```

---

## [4] Configure IP

This option provides you with IP configuration selections.

The following example shows the dialog associated with this option:

```

Enter selection : 4

PORTsw 900TP/12
=====
.
                IP CONFIGURATION

                [1] Set SNMP Read/Write Community
                [2] Add SNMP Trap Addresses
                [3] Delete SNMP Trap Addresses
                [4] Set In-Band Interface IP Address
                [5] Set Out-of-Band Interface IP Address
                [6] Enable/Disable BootP
                [7] Return to Main Menu

=====

Enter selection number : [n] Return
...

```

The following pages describe the IP configuration options:

Topic	Page
[1] Set SNMP Read/Write Community	4-8
[2] Add SNMP Trap Addresses	4-9
[3] Delete SNMP Trap Addresses	4-10
[4] Set In-Band Interface IP Address	4-11
[5] Set Out-of-Band Interface IP Address	4-12
[6] Enable/Disable BootP	4-13

[4] Configure IP

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

This option prompts you to enter the module's read/write community name. The community name can be used for read/write access control.

The following example shows the dialog associated with this option:

```
Enter selection : 1

PORTsw 900TP/12
=====
          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 [public] : public96 <Return>

          SNMP Read/Write community string set.

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

#### [4] Configure IP

### [2] Add SNMP Trap Addresses

This option prompts you to enter IP addresses to which the PORTswitch 900TP/12 module sends SNMP traps. You can enter up to eight trap addresses. If one or more SNMP trap addresses were previously configured, the screen displays those addresses.

The format of an SNMP trap address is the standard 4-octet dotted decimal notation for an IP address, where each octet of the address is represented as a decimal value, separated by a decimal point (.), for example, 16.20.54.156.

The following example shows the dialog associated with this option:

```
Enter selection : 2
PORTsw 900TP/12
=====
ADD SNMP TRAP ADDRESSES

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

example: 16.20.54.156

=====

Enter a Trap address [ ]:
Trap address added! Enter a Trap Address [none] : <Return>
Press Return for IP Configuration Menu...
```

If a trap address was already entered, the following information appears:

```
Configured SNMP Trap Addresses: 16.20.216.81
Trap address [ ] : 16.20.216.81 <Return>
```

[4] Configure IP

### [3] Delete SNMP Trap Addresses

This option prompts you to select SNMP trap addresses for deletion from the community trap address table. If one or more SNMP trap addresses were previously configured, the screen displays those trap addresses.

The following example shows the dialog associated with this option:

```
Enter selection : 3
PORTsw 900TP/12
=====
DELETE SNMP TRAP ADDRESSES

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

example: 16.20.40.156
=====
Configured SNMP Trap Addresses: 16.20.216.81

Enter a Trap address [ ] : 16.20.216.81 <Return>

Trap address deleted. Enter a Trap Address [none] : <Return>

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

## [4] Configure IP

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

This option prompts you to change or enter the module's in-band IP address, subnet mask, and default gateway for the in-band interface. If an IP address was previously configured, the screen displays an in-band IP address.

You do not need to configure the module with a subnet mask for SNMP communications with management stations located on the same subnet as the module.

The factory default setting is no in-band address.

The following example shows the dialog associated with this option:

```
Enter selection : 4

PORTsw 900TP/12
=====

                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
separated by a '.' character.

        example: 16.20.40.156

To delete the IP address, enter 0 in the appropriate address
field.

Interface  IP Address  Subnet Mask  Def.Gateway  Other Info
Ethernet Port
OBM Port                               Speed 9600 bps
=====

Enter the IP address [] : 16.20.216.91 <Return>
Enter the Subnet Mask [] : 255.255.255.0 <Return>
Enter the Default Gateway [] : 16.21.0.1 <Return>

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

[4] Configure IP

### [5] 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 interface. If an IP address was previously configured, the screen displays an out-of-band IP address and subnet mask.

This feature allows you to manage your module through the OBM port as an alternative to normal in-band management. To enable out-of-band management, you need to assign an OBM IP address and select an OBM port speed from the PORTswitch 900TP/12 MAIN INSTALLATION MENU.

The module does not need to be configured with a subnet mask for SNMP and Telnet communications with management stations located on the same subnet as the module.

The following example shows the dialog associated with this option:

```
Enter selection :5
PORTsw 900TP/12
=====
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
separated by a '.' character.
example: 16.20.40.156
=====
Interface      IP Address      Subnet Mask      Def.Gateway      Other Info
Ethernet Port  16.20.216.91    255.255.255.0    16.21.0.1        08-00-2B-A3-CD-08
OBM Port                               Speed 9600 bps
=====
Enter the IP address [] : 16.20.66.156 <Return>
Enter the Subnet Mask [] : 255.255.255.0 <Return>
Press Return for IP Configuration Menu...
```

See *DEChub ONE Installation* or *DEChub ONE-MX Installation* manuals for OBM port cabling information.



#### [4] Configure IP

#### [6] Enable/Disable BootP

This option prompts you to enable or disable the bootstrap protocol (BootP) process. BootP is a protocol that the module uses to determine its IP address automatically by communicating with the BootP server.

The factory default setting is `DISABLED`. If BootP is enabled, the word `DISABLED` shown in the following dialog is replaced with the word `ENABLED`.

The following example shows the dialog associated with this option:

```
Enter selection : 6
PORTsw 900TP/12
=====
                ENABLE/DISABLE BOOTP

BOOTP is the IP bootstrap protocol.  BOOTP may be used
to obtain the module's IP address, subnet mask, and default
gateway. When BOOTP is enabled and the module is not configured
with an IP address, the module will send out BOOTP requests
until it receives a response or is manually configured with
an IP address. When BOOTP is disabled, no BOOTP requests will be
sent.

The BOOTP server must be properly configured to return the
address information.
=====
The BOOTP process is DISABLED
Would you like to ENABLE BOOTP Y/[N]: Y <Return>

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

[5] Dump Error Log

---

## [5] Dump Error Log

This option displays error log dumps for use by Digital support personnel when analyzing system faults. Up to four error log dumps can be stored, and the most recent dump is displayed first. Firmware upgrades are also recorded in the error log.

The following example shows the display associated with this option:

```
Enter selection : 5
PORTsw 900TP/12
=====
DUMP ERROR LOG
CURRENT RESET COUNT: 34
=====
Entry      = 3
Time Stamp = 0 0
Reset Count = 12
Firmware Rev = V2.0
Dump another entry [Y]/N?

=====
No more Error Log entries

Press Return for Main Menu
```

---

### NOTE

The format for some entries in the error log may be different from those shown here.

---

---

## [6] Downline Upgrade

This option allows you to upgrade the module's firmware in nonvolatile flash memory.

### Before You Begin

You can perform the downline upgrade (DLU) in one of the following ways:

<b>If the module has...</b>	<b>Then you can...</b>
Been assigned an IP address	Use the module's in-band interface IP address.
Not been assigned an IP address	Assign an IP address to the module. Use the IP address of the OBM interface in the DEChub ONE.

### Assigning an IP Address

If you need to assign an IP address to the module, complete the following steps:

<b>Step</b>	<b>Action</b>
<b>1</b>	Select the <code>Configure IP</code> option (option 4) from the <code>PORTswitch 900TP/12 MAIN INSTALLATION MENU</code> .
<b>2</b>	Select the <code>Set In-Band Interface IP Address</code> option (option 4) from the <code>IP Configuration</code> menu.
<b>3</b>	Enter the IP address, subnet mask and default gateway and press <code>Return</code> .

The module retains the IP address at the completion of the DLU process.

---

## Using the DLU Process

---

### CAUTION

If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.

---

When you select this option from the PORTswitch 900TP/12 MAIN INSTALLATION MENU, the initial setup screen display appears. This screen identifies the option and alerts the user not to interrupt power during the downline load.

```
Enter selection : 6

PORTsw 900TP/12
=====
                DOWNLINE UPGRADE

This process upgrades the module's firmware (in nonvolatile Flash
memory). Enter the IP address of your TFTP (Trivial File Transfer
Protocol) load host and the image file name when prompted.

* * * * *
*      IMPORTANT!      IMPORTANT!      IMPORTANT!      *
* * * * *
*   If power is interrupted during the downline load, the   *
*   firmware image can be corrupted. Do not turn off power  *
*   to the unit or perform any action that can cause the   *
*   unit to lose power during a downline upgrade.          *
* * * * *
=====
Press <Return>to Continue...
```

## Using the DLU Process

### Initializing the Process

To initiate the DLU process, complete the following steps:

Step	Action	Example
1	Press Return.	<b>&lt;Return&gt;</b>
2	If the file is located in the default TFTP directory, enter the firmware image file name and press Return. (The TFTP load host conventions specify the format of the firmware image file name). If the file is not in the default TFTP directory, enter the complete path name and press Return.	<b>DETPX160.BIN</b> <b>&lt;Return&gt;</b>  <b>C/BOOT/</b> <b>DETPX160.BIN</b> <b>&lt;Return&gt;</b>
3	Enter the IP address of the TFTP load host, and press Return. The screen displays the following message:	<b>16.20.40.156 &lt;Return&gt;</b>
<div data-bbox="466 1129 915 1396" style="border: 1px solid black; border-radius: 15px; padding: 10px; background-color: #f0f0f0;"><pre>Load will be initiated over the in-band network interface. The device becomes nonfunctional for up to 10 minutes during the time that the flash load is in progress.  Press Return Key to Start Load [Ctrl/C to abort] . . .</pre></div>		
4	Press Return.	<b>&lt;Return&gt;</b>

When you press <Return>, you initiate the DLU process over the LAN that is connected to the load host. The screen displays the following message:

DLU process started!

## Using the DLU Process

### DLU Process Stages

The DLU process consists of four stages:

Stage	Description
1	Transferring the image to the module's temporary storage buffer
2	Verifying the image
3	Writing the new image into nonvolatile flash memory
4	Resetting module and self-test

Table 4-1 explains what happens during each stage of the DLU process:

**Table 4-1: DLU Process Description**

Stage	Description
1	<p><b>The DLU process transports the new firmware image across the network from the TFTP load host and places it into a temporary storage buffer in the module.</b></p> <p>This stage normally takes 1 minute to complete. However, due to variations in network configurations (load path and traffic levels), this stage can take 10 minutes or more.</p> <p>The following states indicate that this stage is in progress:</p> <ul style="list-style-type: none"><li>• Module status – functional but not manageable</li><li>• Module cannot respond to management requests</li><li>• LED display – normal operation</li><li>• Setup screen display –</li></ul> <div style="border: 1px solid gray; border-radius: 15px; padding: 5px; width: fit-content; margin: 10px 0;"><p>DLU process started! .....</p></div> <p>When the series of dots ends, the screen displays the following message:</p> <div style="border: 1px solid gray; border-radius: 15px; padding: 5px; width: fit-content; margin: 10px 0;"><p>Transfer complete</p></div>

*continued on next page . . .*

## Using the DLU Process

Stage	Description
2	<p><b>The module verifies that the firmware image is correct.</b></p> <p>This stage normally takes 10 seconds to complete.</p> <p>The following states indicate that this stage is in progress:</p> <ul style="list-style-type: none"><li>• Module status – functional, but not manageable</li><li>• Module cannot respond to management requests</li><li>• LED display – normal operation</li></ul>
3	<p><b>The DLU process transfers the new image from the module's temporary storage buffer to the nonvolatile flash memory, overwriting the old image.</b></p> <p><b>CAUTION:</b> If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.</p> <p>This stage normally takes less than 2 minutes to complete.</p> <p>The following states indicate that this stage is in progress:</p> <ul style="list-style-type: none"><li>• Module status – not functional or manageable</li><li>• Module cannot respond to management requests</li><li>• LED display:<ul style="list-style-type: none"><li>— Power LED is on.</li><li>— Module OK LED is on.</li><li>— Port State LED 4 lights green for 3 or 4 seconds.</li><li>— Port State LED 5 lights green for up to 2 minutes.</li><li>— All the Port State LEDs flash alternately green and yellow for 10 seconds.</li></ul></li></ul>

*continued on next page . . .*

## Using the DLU Process

Stage	Description
4	<p><b>The module resets, runs self-test, and then begins executing the new firmware image.</b></p> <p>This stage normally takes 1 minute to complete.</p> <p>The following states indicate that this stage is in progress:</p> <ul style="list-style-type: none"><li>• Module status – not functional or manageable.</li><li>• Module cannot respond to management requests.</li><li>• LED display:<ul style="list-style-type: none"><li>— Power LED is on.</li><li>— Module OK LED is off.</li><li>— Port State LEDs flash indicating various subroutines are running (standard self-test pattern).</li></ul></li></ul>

### If the Process Does not Complete

If the process does not complete as described in Stage 3, take one of the following actions:

If...	Then...	Because...
The module loses power	Contact your Digital representative.	The firmware image is corrupted.
The Port State LEDs 4 and 5 do not light	Check that the load host is operational.	The load did not succeed.
All the Port State LEDs light yellow after Port State LED 4 or 5 lights	Retry the load procedure. If the problem persists, contact your Digital service representative.	A loading error has occurred.



## Using the DLU Process

### When the DLU Process is Complete

When the DLU process is complete, the following events occur:

- The module exits from the DLU process.
- The module begins the execution of the new firmware image.
- The Module OK LED turns on.
- The module becomes fully operational.

### Verifying the Upgrade

After the DLU process has completed, you can verify the firmware upgrade by completing the following steps:

<b>Step</b>	<b>Action</b>
<b>1</b>	Select Option [3] Show Current Settings from the PORTswitch 900TP/12 MAIN INSTALLATION MENU.
<b>2</b>	Verify that the correct firmware version has been loaded.
<b>3</b>	Press <Return> for the Main menu.

## [7] Configure Out-of-Band Port

---

### [7] Configure Out-of-Band Port

This option lets you select and enter the speed of your OBM port. The factory default for this option is 9600. The OBM port speed that you select must match the speed of your OBM device.

---

#### NOTE

The port speeds at both ends of the communications link must be identical.

---

The following example shows the dialog associated with this option:

```
Enter selection : 1
PORTsw 900TP/12
=====
          SET OUT-OF-BAND (OBM) PORT SPEED
          [1] 2400 baud
          [2] 9600 baud
          [3] 19200 baud
          [4] 38400 baud
          =====
Enter selection : [2] (9600) : [n] <Return>
          OBM port speed set

Press Return for OBM Configuration Menu...
```

---

## [8] Product-Specific Options

This option provides product-specific selections when you are using the DEChub ONE-MX or the DEChub ONE. When selected, the option allows you to return to the Main Menu.

The following example shows the dialog associated with this option:

```
Enter selection : 8
PORTsw 900TP/12
=====
PORTswitch 900TP/12 Installation
[0] Return to Main Menu

=====
Enter selection : [n] <Return>
Press Return for Main Menu...
```



## Chapter 5

---

# Configuring the Module in a DEChub 900

---

### Overview

#### Introduction

This chapter describes how to configure your PORTswitch 900TP/12 when it resides in a DEChub 900 MultiSwitch.

#### In This Chapter

---

Topic	Page
DEChub 900 MultiSwitch Installation Menu	5-2
[9] Start Redirect Mode	5-3
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[10] Product-Specific Options	5-26

---

## DEChub 900 MultiSwitch INSTALLATION MENU

The following example shows 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] Restart with Factory Defaults
[2] Restart 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 <Return>
Press Return for Main Menu ...
```

---

## [9] Start Redirect Mode

The `Start Redirect Mode` option redirects the DEChub 900 MultiSwitch Hub Manager setup port to the setup port of any network module (such as the PORTswitch 900TP/12) that is installed into the DEChub 900. This option allows you to configure or obtain 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 prompts you for a slot number (3) as shown in the following example. After you enter the number of the slot in which the PORTswitch 900TP/12 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 you how to select a slot number:

```
Enter selection: 9
=====
Enter the slot number for redirection (1-8): 3 <Return>
Console redirected to 3: PORTsw 900TP/12
Attempting connection [Ctrl/C to Abort]...
Connection successful!
```

If the redirection is successful, after you press **<Return>**, the PORTswitch 900TP/12 `MAIN INSTALLATION MENU` appears on your screen.

## Using Menus to Configure the Module

The following screen shows the options available from the PORTswitch 900TP/12 MAIN INSTALLATION MENU when the module is operating in a DEChub 900 configuration.

Note that when your module is installed in the DEChub 900, the slot number where the module is installed appears at the top of the menu.

```
PORTsw 900TP/12      -   slot 3
=====
          PORTswitch 900TP/12 MAIN INSTALLATION MENU
[1] Restart with Factory Defaults
[2] Restart with Current Settings
[3] Show Current Settings
[4] Configure IP
[5] Dump Error Log
[6] Downline Upgrade
[7] Product-Specific Options
[Ctrl/C] Return to Hub Manager Installation Menu
=====
Enter selection:  [n] <Return>
```



## [1] Restart with Factory Defaults

---

### [1] Restart with Factory Defaults

This option reboots the module, causing its configured nonvolatile random access memory (NVRAM) parameters to be initialized to factory default values followed by a module reset. If you need to reboot the module and retain the current settings, choose option [ 2 ] from the PORTswitch 900TP/12 MAIN INSTALLATION MENU.

---

#### CAUTION

This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost.

---

#### NOTE

Allow approximately 1 minute for the module to reboot and complete self-test.

The following example shows the dialog associated with this option:

```
Enter selection : 1
DEChub 900 MultiSwitch
=====
                RESTART WITH FACTORY DEFAULTS
* * * * *
*   IMPORTANT!   IMPORTANT!   IMPORTANT!   *
* * * * *
* This selection will delete the current configuration *
* settings and reset the system with the factory default *
* settings. All configuration settings will be lost. *
* * * * *
=====
Press Y to confirm [N]:  Y <Return>
Press Return for Main Menu...
```

[2] Restart with Current Settings

---

## [2] Restart with Current Settings

This option resets the module but leaves the module's configured nonvolatile configuration storage parameters at their current values.

---

### NOTE

Allow approximately 1 minute for the module to restart.

---

The following example shows the dialog associated with this option:

```
Enter selection: 2
DEChub 900 MultiSwitch
=====
          RESTART WITH CURRENT SETTINGS
This selection will reset your system with the current
configuration settings.
=====
Press Y to confirm [N] : <Return>
Press Return for Main Menu...
```

### [3] Show Current Settings

---

## [3] Show Current Settings

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

The following example shows the display associated with this option:

```
=====
                          Enter selection : 3
DEChub 900 MultiSwitch
=====
HUB900MultiSwitch,DEChub 900 MultiSwitch,HW=F,RO=V1.1.6,SW=T5.0.28
SysUpTime           : 6 days 00:03:25 28 resets
SNMP Read/Write Community : public
SNMP Trap Addresses  : 16.7.88.156
Status of last Downline Upgrade : TFTP Read
                          : 00:02:55 27 resets
                          Transfer Complete

Out-of-Band (OBM) Management RTS : Disabled
Interface   IP Address   Subnet Mask   Def.Gateway   Other Info
-----
OMB Port
Hub Slot 1  16.21.3.97   255.255.0.0
                          Speed 9600 bps
                          Active

=====
                          ...Press Return Key to Continue...

DEChub 900 MultiSwitch
=====
Hub Name           : DEChub 900 MultiSwitch
Hub Serial Number  :
Hub Location       :
Hub Contact        :
Automatic VNbus connection : Disabled
=====
                          ...Press Return for Main Menu ...
```

## [4] Configure IP

---

### [4] Configure IP

This option provides you with IP configuration selections.

The following example shows the dialog associated with this option:

```
Enter selection : 4

DEChub 900 MultiSwitch
=====
                        IP CONFIGURATION

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

=====

Enter selection number : [n] <Return>
```

The following pages describe the IP configuration options:

Topic	Page
[1] Set SNMP Read/Write Community	5-9
[2] Add SNMP Trap Addresses	5-10
[3] Delete SNMP Trap Addresses	5-11
[4] Set In-Band Interface IP Address	5-12
[5] Set Out-of-Band Interface IP Address	5-13

#### [4] Configure IP

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

This option prompts you to enter the module's read/write community name. The community name can be used for read/write access control.

The following example shows the dialog associated with this option:

```
Enter selection : 1

DEChub 900 Multiswitch
=====
          SET SMNP 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 [public] : public96 <Return>

          SNMP Read/Write community string set.

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

[4] Configure IP

## [2] Add SNMP Trap Addresses

This option prompts you to enter IP addresses to which the PORTswitch 900TP/12 module sends SNMP traps. You can enter up to eight trap addresses. If one or more SNMP trap addresses were previously configured, the screen displays those addresses.

The format of an SNMP trap address is the standard 4-octet dotted decimal notation for an IP address, where each octet of the address is represented as a decimal value, separated by a decimal point (.), for example, 16 . 20 . 54 . 156.

The following example shows the dialog associated with this option:

```
Enter selection : 2
DEChub 900 MultiSwitch
=====
ADD SNMP TRAP ADDRESSES
Format: The standard 4 octet dotted decimal notation in which
each octet of the address is represented as a decimal
separated by a '.' character.

example: 16.20.54.156
=====
Enter a Trap address [ ]:
Trap address added! Enter a Trap Address [none] : <Return>
Press Return for IP Configuration Menu...
```

#### [4] Configure IP

### [3] Delete SNMP Trap Addresses

This option prompts you to select SNMP trap addresses for deletion from the community trap address table. If one or more SNMP trap addresses were previously configured, the screen displays those trap addresses.

The following example shows the dialog associated with this option:

```
Enter selection : 3
DEChub 900 MultiSwitch
=====
DELETE SNMP TRAP ADDRESSES

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

example: 16.20.40.156

=====
Configured SNMP Trap Addresses: 16.20.216.81

Enter a Trap address [ ] : 16.20.216.81 <Return>

Trap address deleted. Enter a Trap Address [none] : <Return>

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

#### [4] Configure IP

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

This option prompts you to change or enter the module's in-band IP address, subnet mask, and default gateway for the in-band interface. If an IP address was previously configured, the screen displays an in-band IP address.

You do not need to configure the module with a subnet mask for SNMP communications with management stations located on the same subnet as the module.

The factory default setting is no in-band address.

The following example shows the dialog associated with this option:

```
Enter selection : 4
DEChub 900 MultiSwitch
=====
                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 IP address, enter 0 in the appropriate address
        field.
Interface      IP Address      Subnet Mask      Def.Gatewa      Other Info
-----
OBM Port
Hub Slot 1    16.21.3.97      255.255.0.0      Active          Speed 9600 bps
=====
Slot Number (1-8) [1] :
Enter the IP address [ ] : 16.20.54.156 <Return>
Enter the Subnet Mask [ ] : 255.255.0 0 : <Return>
Enter the Default Gateway [ ] : 16.21.0.1 <Return>.
                Press Return for IP Configuration Menu...
```



#### [4] Configure IP

#### [5] 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 interface. The module does not need to be configured with a subnet mask for SNMP communications when management stations are 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 (.).

If the module is in a DEChub 900, the Out-of-Band Management (OBM) feature allows you to manage your module through the OBM port located on the DEChub 900. To enable out-of-band management, you need to assign an OBM IP address.

The following example shows the dialog associated with this option:

```
Enter selection :5
DEChub 900 MultiSwitch
=====
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: 16.20.40.156
Interface  IP Address  Subnet Mask  Def.Gateway  Other Info
-----
OBM Port
Hub Slot 1 16.21.3.97    255.255.0.0          Speed 9600 bps
Active
=====
Enter the IP address [16.20.66.156] : 16.20.66.156<Return>
Enter the Subnet Mask [255.255.255.0] : 255.255.255.0 <Return>
Press Return for IP Configuration Menu ...
```

[5] Dump Error Log

---

## [5] Dump Error Log

This option displays error log dumps for use by Digital support personnel when analyzing system faults. Up to four error log dumps can be stored, and the most recent dump is displayed first. Firmware upgrades are also recorded in the error log.

The following example shows the display associated with this option:

```
Enter selection : 5
DEChub 900 MultiSwitch
=====
DUMP ERROR LOG
CURRENT RESET COUNT: 34
=====
Entry      = 4
Time Stamp = 0 0
Reset Count = 122
SW V4.1.1 -> T5.0.28; config retained
Dump another entry [Y]/N?

=====
No more Error Log entries

Press Return for Main Menu
```

---

### NOTE

The format for some entries in the error log may be different from those shown here.

---

---

## [6] Downline Upgrade

This option allows you to upgrade the module's firmware in nonvolatile flash memory.

### Before You Begin

You can perform the downline upgrade (DLU) in one of the following ways:

<b>If the module has...</b>	<b>Then you can...</b>
Been assigned an IP address	Use the module's in-band interface IP address.
Not been assigned an IP address	Use the IP address of the DEChub 900 Hub Manager. <i>Note:</i> Refer to the <i>DEChub 900 MultiSwitch Owner's Manual</i> for more information. Assign an IP address to the module.

### Assigning an IP Address

If you need to assign an IP address to the module, complete the following steps:

<b>Step</b>	<b>Action</b>
<b>1</b>	Select the <code>Configure IP</code> option (option 4) from the <code>PORTswitch 900TP/12 MAIN INSTALLATION MENU</code> .
<b>2</b>	Select the <code>Set In-Band Interface IP Address</code> option (option 4) from the <code>IP Configuration</code> menu.
<b>3</b>	Enter the IP address, subnet mask, default gateway and press <code>Return</code> .

The module retains the IP address at the completion of the DLU process.

---

## Using the DLU Process

---

### CAUTION

If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.

---

When you select this option from the PORTswitch 900TP/12 MAIN INSTALLATION MENU, the initial setup screen display appears. This screen identifies the option and alerts the user not to interrupt power during the downline load.

```
Enter selection : 6

DEChub 900 MultiSwitch
=====

                DOWNLINE UPGRADE

This process upgrades the module's firmware (in nonvolatile Flash
memory). Enter the IP address of your TFTP (Trivial File Transfer
Protocol) load host and the image file name when prompted.

* * * * *
*   IMPORTANT!           IMPORTANT!           IMPORTANT!   *
* * * * *
*   If power is interrupted during the downline load, the   *
*   firmware image can be corrupted. Do not turn off power  *
*   to the unit or perform any action that can cause the   *
*   unit to lose power during a downline upgrade.          *
* * * * *
=====
Press Return Key to Continue...
```

## Using the DLU Process

### Initializing the Process

To initiate the DLU process, complete the following steps:

Step	Action	Example
1	Press Return.	<Return>
2	If the file is in the default TFTP directory, enter the firmware image file name and press Return. (The TFTP load host conventions specify the format of the firmware image file name).  If the file is not in the default TFTP directory, enter the complete path name and press Return.	<b>DEBTP160.BIN</b> <Return>  <b>/BOOT/</b> <b>DEBTP160.BIN</b> <Return>
3	Enter the IP address of the TFTP load host, and press Return. The screen displays the following message:	<b>16.20.40.156</b>
	<div data-bbox="464 1129 915 1396" style="border: 1px solid black; border-radius: 15px; padding: 10px; background-color: #f0f0f0;"><pre>Load will be initiated over the in-band network interface. The device becomes nonfunctional for up to 10 minutes during the time that the flash load is in progress.  Press Return Key to Start Load [Ctrl/C to abort] . . .</pre></div>	
4	Press Return.	<Return>

When you press <Return>, you initiate the DLU process over the LAN that is connected to the load host. The screen displays the following message:

```
DLU process started!
. . . . .
```

Using the DLU Process

## The DLU Process Stages

The DLU process consists of four stages:

<b>Stage</b>	<b>Description</b>
1	Transferring the image to the module's temporary storage buffer
2	Verifying the image
3	Writing the new image into nonvolatile flash memory
4	Module reset and self-test

Table 5-1 explains what happens during each stage of the DLU process.

**Table 5-1: DLU Process Description**

Stage	Description
1	<p data-bbox="468 653 1199 741"><b>The DLU process transports the new firmware image across the network from the TFTP load host and places it into a temporary storage buffer in the module.</b></p> <p data-bbox="468 751 1199 840">This stage normally takes 1 minute to complete. However, due to variations in network configurations (load path and traffic levels), this stage can take 10 minutes or more.</p> <p data-bbox="468 850 1083 882">The following states indicate that this stage is in progress:</p> <ul data-bbox="468 892 989 1039" style="list-style-type: none"> <li data-bbox="468 892 968 924">• Module status – functional and manageable</li> <li data-bbox="468 934 989 966">• Module can respond to management requests</li> <li data-bbox="468 976 852 1008">• LED display – normal operation</li> <li data-bbox="468 1018 758 1050">• Hub Manager display –</li> </ul> <div data-bbox="468 1060 772 1134" style="border: 1px solid gray; border-radius: 15px; padding: 5px; margin: 5px 0;"> <pre data-bbox="516 1071 762 1113">PORTswitch 900TP/12 unknown</pre> </div> <ul data-bbox="468 1155 747 1186" style="list-style-type: none"> <li data-bbox="468 1155 747 1186">• Setup screen display –</li> </ul> <div data-bbox="468 1197 772 1270" style="border: 1px solid gray; border-radius: 15px; padding: 5px; margin: 5px 0;"> <pre data-bbox="491 1218 749 1260">DLU process started! . . . . .</pre> </div> <p data-bbox="468 1312 1136 1375">When the series of dots ends, the screen displays the following message:</p> <div data-bbox="468 1396 789 1470" style="border: 1px solid gray; border-radius: 15px; padding: 5px; margin: 5px 0;"> <pre data-bbox="527 1438 753 1459">Transfer complete.</pre> </div>

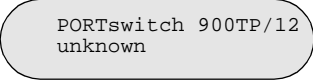
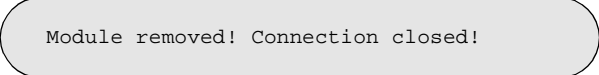
*continued on next page. . .*

## Using the DLU Process

Stage	Description
<b>2</b>	<p><b>The module verifies that the firmware image is correct.</b></p> <p>This stage normally takes 10 seconds to complete.</p> <p>The following states indicate that this stage is in progress:</p> <ul style="list-style-type: none"><li>• Module status – functional and manageable</li><li>• Module can respond to management requests</li><li>• LED display – normal operation</li><li>• Hub Manager display –</li></ul> <div data-bbox="415 940 726 1016" style="border: 1px solid black; border-radius: 15px; padding: 5px; width: fit-content; margin: 10px 0;"><pre>PORTswitch 900TP/12 unknown</pre></div>
<b>3</b>	<p><b>The DLU process transfers the new image from the module's temporary storage buffer to the nonvolatile flash memory, overwriting the old image.</b></p> <p><b>CAUTION:</b> If power is interrupted during Stage 3 of the DLU process, the firmware image can become corrupted. Do not turn off power to the unit or perform any action that can cause the unit to lose power during Stage 3 of the DLU process.</p> <p>This stage normally takes less than 2 minutes to complete.</p>



## Using the DLU Process

Stage	Description
3 (cont.)	<p>The following states indicate that this stage is in progress:</p> <ul style="list-style-type: none"><li>• Module status – not functional or manageable</li><li>• Module cannot respond to management requests</li><li>• LED display:<ul style="list-style-type: none"><li>— Power LED is on.</li><li>— Module OK LED is on.</li><li>— Port State LED 4 lights green for 3 or 4 seconds.</li><li>— Port State LED 5 lights green for up to 2 minutes.</li><li>— All the Port State LEDs flash alternately green and yellow for 10 seconds.</li></ul></li><li>• Hub Manager display – </li><li>• Setup screen display – </li></ul>

These messages are normal and indicate the module is not manageable.

*continued on next page. . .*

## Using the DLU Process

Stage	Description
4	<p><b>The module resets, runs self-test, and then begins executing the new firmware image.</b></p> <p>This stage normally takes 1 minute to complete.</p> <p>The following states indicate that this stage is in progress:</p> <ul style="list-style-type: none"><li>• Module status – not functional or manageable.</li><li>• Module cannot respond to management requests.</li><li>• LED display –<ul style="list-style-type: none"><li>— Power LED is on.</li><li>— Module OK LED is off.</li><li>— Port State LEDs flash indicating various subroutines are running (standard self-test pattern).</li></ul></li><li>• Hub Manager display –<div data-bbox="415 1108 726 1192" style="border: 1px solid gray; border-radius: 15px; padding: 5px; width: fit-content; margin: 10px 0;">PORTswitch 900TP/12 unknown</div></li></ul> <p>This message is normal and indicates the module is not manageable.</p>

### If the Process Does not Complete

If the process does not complete as described in Stage 3, take one of the following actions:

If...	Then...	Because...
The module loses power.	Contact your Digital representative.	The firmware image is corrupted.
The Port State LEDs 4 and 5 do not light.	Check that the load host is operational.	The load did not succeed.
All the Port State LEDs light yellow after Port State LED 4 or 5 lights.	Retry the load procedure. If the problem persists, contact your Digital service representative.	A loading error has occurred.

## Using the DLU Process

### When the DLU Process is Complete

When the DLU process is complete, the following events occur:

- The module exits from the DLU process.
- The module begins the execution of the new firmware image.
- The Module OK LED turns on.
- The module becomes fully operational.
- The Hub Manager status display shows the following message:

```
PORTswitch 900TP/12  
up
```

### Verifying the Upgrade

After the DLU process has completed, you can verify the firmware upgrade by completing the following steps:

Step	Action
1	Select Option [3] Show Current Settings from the PORTswitch 900TP/12 MAIN INSTALLATION MENU.
2	Verify that the correct firmware version has been loaded.
3	Press <Return> for the Main Menu.

## [7] Configure Out-of-Band Port

---

### [7] Configure Out-of-Band Port

This option lets you select and enter the speed of your OBM port. The factory default for this option is 9600. The OBM port speed that you select must match the speed of your OBM device.

---

#### NOTE

The port speeds at both ends of the communications link must be identical.

---

The following example shows the dialog associated with this option:

```
Enter selection : 7
DEChub 900 MultiSwitch
=====
          SET OUT-OF-BAND (OBM) PORT SPEED
          [1] Set Port Speed
          [2] Enable/Disable RTS
          [3] Return to Main Menu
=====
Enter selection :
```

[8] Start Event Display Mode

---

## [8] Start Event Display Mode

When selected, this option allows you to start Event Display Mode.

The following example shows the dialog associated with this option:

```
Enter selection : 8
Press return to start event log [Ctrl/C to abort] . . .
```

## [10] Product-Specific Options

---

### [10] Product-Specific Options

This option provides product-specific selections when you are using the DEChub 900. When selected, the option allows you to:

- Enable/disable Automatic VNbus Connector
- Return to Main menu

The following example shows the dialog associated with this option:

```
Enter selection : 10

DEChub 900 MultiSwitch
=====
                PRODUCT-SPECIFIC OPTIONS
                [1] Enable/Disable Automatic VNbus Connector
                [2] Return to Main Menu
=====
Enter selection : [n] <Return>
```

## Chapter 6

---

# Removing the Module

---

### Overview

#### Introduction

This chapter describes how to remove the module from a DEChub 900 MultiSwitch. To remove the module from a standalone unit, refer to the *DEChub ONE Installation* manual.

#### In This Chapter

Topic	Page
Removing the Cable	6-2
Unseating the Module	6-3

## Removing the Cable

---

### Removing the Cable

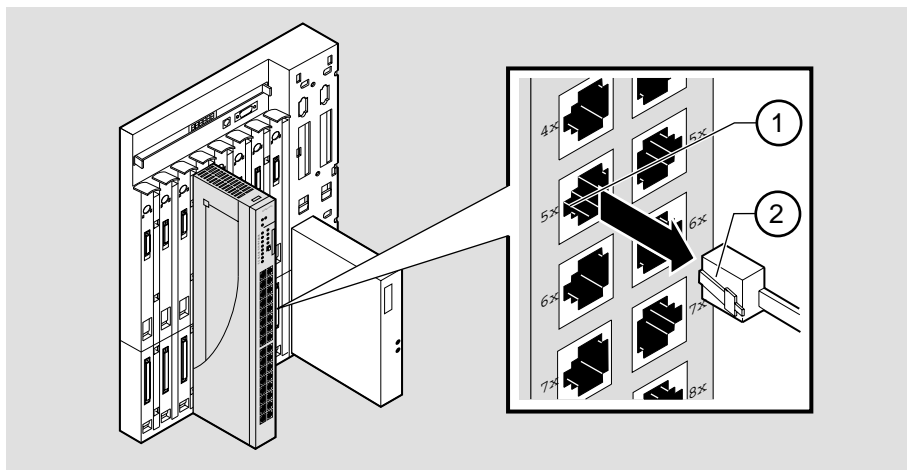
To remove the cables from the module, complete the following step (see Figure 6-1):

---

Step	Action
1	Press the release tab (2) on the cable plug, then pull out the cable.

---

**Figure 6-1: Removing the Cable**



NPB-0007-95F

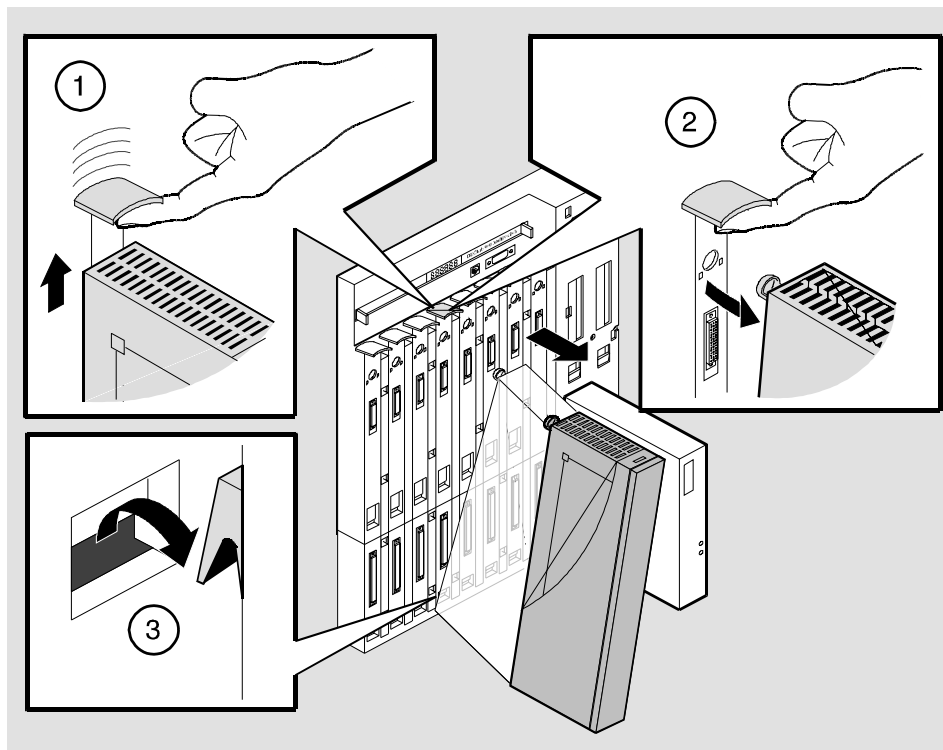


## Unseating the Module

To unseat the module from the DEChub 900, complete the following steps (see Figure 6-2):

Step	Action
1	Hold the module and 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 from the backplane.

Figure 6-2: Unseating the Module



NPG-0008-95F



## Chapter 7

---

# Redundant-Link Configuration

---

### Overview

This chapter describes the configuration and implementation of the redundant-link pair (RLP) of Ethernet 10BaseT links.

Redundant-link configuration refers to two Ethernet links that are configured on a single LAN to provide greater fault tolerance than a single port-to-port configuration provides.

---

#### NOTE

You must configure the links using clearVISN before connecting the cables. Failure to do so can lead to a configuration, such as a repeater loop, that seriously impairs the performance on that segment of the LAN.

---

### In This Chapter

Topic	Page
Basic Configuration	7-2
Redundant-Link Components	7-3
Redundant-Link Operation	7-5
Simple Redundant-Link Configuration	7-6
Complex Redundant-Link Configuration	7-8
Partial Fault Detection	7-9
Full Fault Detection	7-11
Recommendations for Redundant-Link Configuration	7-13

---

## Basic Configuration

### Introduction

The basic redundant-link configuration consists of a pair of master ports on the same module and two remote ports on one module or on separate modules. These ports must reside on the same LAN or extended LAN.

---

#### NOTE

This configuration does not result in a repeater loop because only one of the links is active at one time.

---

The remote ports can be one of two types:

- A responder port that provides full fault detection.
- A nonresponder port that provides only partial fault detection.

### Major Components

Redundant links consist of the following major components:

- Master port pair
- Responder ports
- Nonresponder ports
- Master control algorithm (MCA)
- Primary link
- Security link

## Redundant-Link Components

### Introduction

This section describes the components that make up a redundant-link configuration.

### Redundant-link Pair

The redundant-link pair (RLP) is a pair of links that provide fault-tolerant communication in the event of transmitter, receiver, or cable failures.

### Master Port Pair

The master port pair is the pair of manageable ports that reside on the module that contains the master control algorithm. One link of the master port pair is the primary link; the other is the secondary link.

### Responder Ports

A responder port, (referred to as a responder) is a manageable port that can detect a failure on its receive link and signal the master port that there is a failure. Responder ports enable full fault decision.

### Nonresponder Ports

A nonresponder port is a port that cannot signal the master that there is a failure. Use of nonresponder ports in a redundant-link pair provides only partial fault detection.

Responder and nonresponder ports reside on a separate module from that of the master port, but must reside on the same LAN or extended LAN.

The responder and nonresponder ports can reside on the same module as each other or on separate modules.

### Master Control Algorithm

The master control algorithm (MCA) resides within the module that is assigned as the master and contains the master port pair. The MCA does the following tasks:

- Controls the active and standby status of each of the two ports of the master port pair.
- Monitors and reports the states of both links, and stores the status information in a Management Information Base (MIB).
- Counts the number of link state transitions and stores the information in a MIB.

## Redundant-Link Components

### **Primary Link**

The primary link, assigned by the MCA, is the active link at the module initialization time and after a reset.

### **Secondary Link**

The secondary link, assigned by the MCA, is the inactive link at the module initialization time and after a reset. The secondary link becomes active if the MCA detects a failure in the primary.

---

## Redundant-Link Operation

### Introduction

The master control algorithm (MCA) controls the redundant-link operation by:

- Enabling the primary link at initialization time (assuming that there are no failures on that link).
- Monitoring the primary link status for failures.

When it detects a failure of the primary link, the MCA does the following:

---

Stage	Description
1	Disables the primary link.
2	Enables the secondary link. This typically occurs within 3 to 6 milliseconds (10 milliseconds maximum).

---

Once the primary link is repaired, it remains inactive until one of the following events occur:

- The MCA detects a failure in the secondary link.
- The secondary port is internally partitioned or disabled.
- The module is rebooted.

---

## Simple Redundant-Link Configuration

### Introduction

In its simplest form, a redundant link consists of a pair of master ports that reside on one module, and a pair of responder or nonresponder ports on a remote module. The remote module is another module in a remote site in the building that is linked using fiber-optic links. (See Figure 7-1).

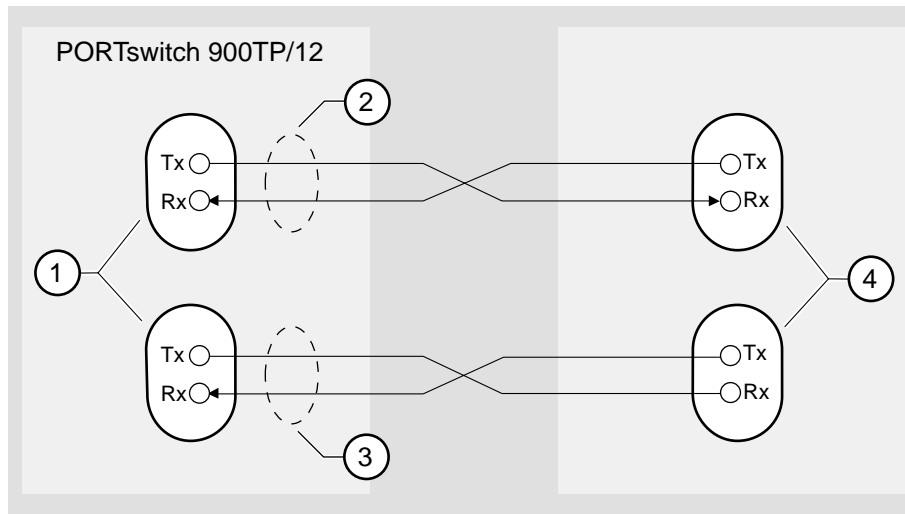
---

#### NOTE

Use crossover (x) cables when connecting two PORTswitches or DECrepeaters.

---

**Figure 7-1: Simple Redundant-Link Configuration**



NPB-0097-95F



### Simple Redundant-Link Configuration

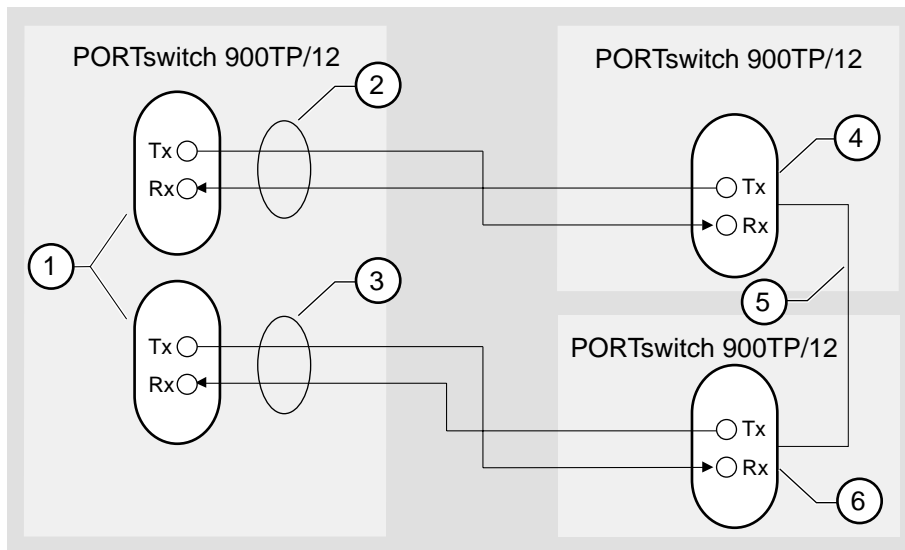
<b>Item</b>	<b>Description</b>
1	Master port pair
2	Primary link
3	Secondary link
4	Single responder ports, nonresponder ports, or a combination. These ports may be on one module or separate modules.

## Complex Redundant-Link Configuration

### Introduction

A complex redundant-link configuration consists of a master port pair and responder-ports, nonresponder ports, or a combination of the two. The responder or nonresponder ports reside on separate modules, as shown in Figure 7-2.

**Figure 7-2: Complex Redundant-Link Configuration**



NPB-0767-96F

Item	Description
1	Master port pair
2	Primary link
3	Secondary link
4	Single responder ports
5	Backbone link between these ports
6	Single nonresponder port

---

## Partial Fault Detection

### Introduction

Partial fault detection allows the PORTswitch 900TP/12 to achieve limited fault tolerance with connections to nonresponder repeaters, such as the DEC repeater 900TM, DEC repeater 90TS, DEC repeater 90T, or to any IEEE compliant 10BaseT repeaters. (See Figure 7-3.)

When the link is configured for partial fault tolerance, the MCA disables the primary port and enables the secondary port under the following circumstances:

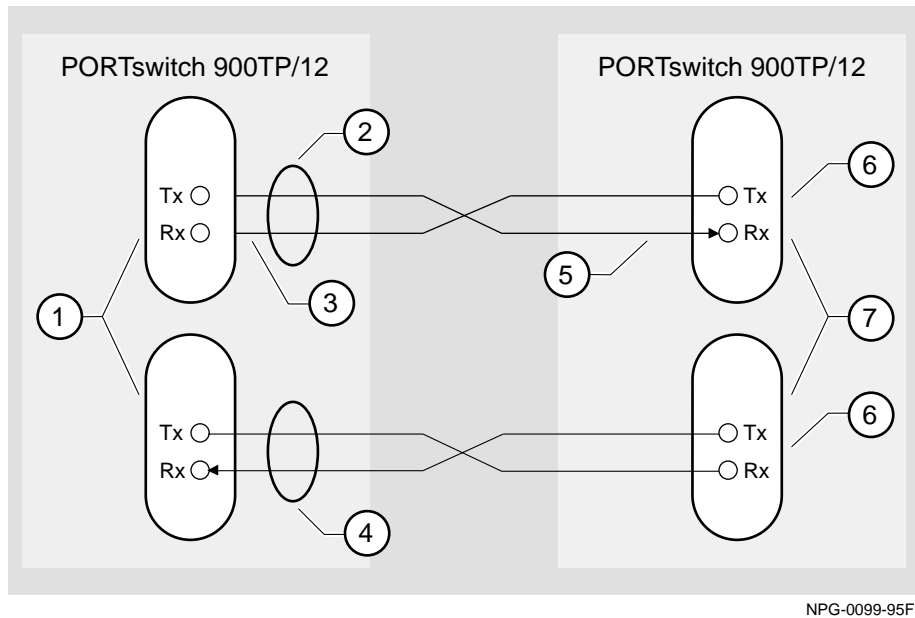
- A link failure of the master's primary receive port
- Partitioning internally detected failures:
  - An excessive number of collisions
  - An excessively long collision
  - Received jabbering
  - Internally detected MAU failure

Partial fault detection adequately detects most failure conditions. However, it cannot detect a link failure to the nonresponder receive port.

See the following section, Full Fault Detection, for a comparison of partial fault detection to full fault detection.

## Partial Fault Detection

**Figure 7-3: Partial Fault Detection Configuration**



Item	Description
1	Master port pair
2	Primary link (initially active)
3	The master can detect a link failure on its receiver (Rx)
4	Secondary link (initially standby and disabled)
5	The master cannot detect a link failure on nonresponder receiver (Rx)
6	Single nonresponder ports (always enabled)
7	These ports may be on the same module or separate modules

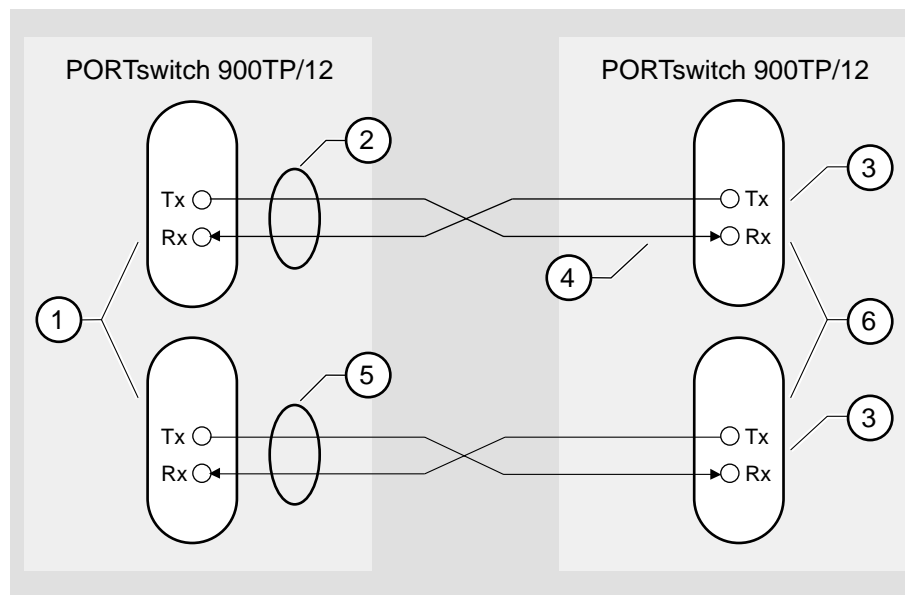
## Full Fault Detection

### Introduction

The PORTswitch 900TP/12 supports full fault detection. When the PORTswitch 900TP/12 ports are connected to the ports of another repeater that supports this feature, such as another PORTswitch 900TP/12, failures are detected at either end of the receive or transmit link (Figure 7-4).

If the responder's receive port detects a link failure, the responder signals the MCA. This allows the MCA to disable the master primary port and enable the master secondary port.

**Figure 7-4: Full Fault Detection Configuration**



NPB-0100-95F

## Full Fault Detection

The following legend identifies the callouts in Figure 7-4.

<b>Item</b>	<b>Description</b>
1	Master port pair
2	Primary link (initially active)
3	Single nonresponder ports (always enabled)
4	The master can detect a link failure here
5	Secondary link (initially standby and disabled)
6	These ports may be on the same module or separate modules

## Fault Detection Comparison

Table 7-1 shows the difference in failure detection between partial fault detection and full fault detection.

**Table 7-1: Comparison of Partial Fault Detection to Full Fault Detection**

<b>If a link failure occurs in the master port's...</b>	<b>Then partial fault detection...</b>	<b>Then full fault detection...</b>
Tx Link	Does not detect the failure	Detects the failure
Rx Link	Detects the failure	Detects the failure

## Recommendations for Redundant-Link Configuration

### Introduction

The following recommendations should be considered when configuring the PORTswitch 900TP/12 as redundant links:

- Use responder ports (rather than nonresponder ports) whenever possible.
- If you use a combination of responder ports and nonresponder ports, assign the responder ports to the primary link and the nonresponder ports to the secondary link.
- Assign the remote ports (responder or nonresponder) to separate modules to ensure that one of the two remote ports is functional if a remote module fails.
- Whenever possible, configure primary and secondary link cables into separate pathways to avoid a single point of failure.





# Appendix A

---

## Problem Solving

---

### Overview

#### Introduction

This appendix describes the light-emitting diode (LED) functions and provides problem solving information.

#### In This Appendix

Topic	Page
LED Descriptions	A-2
Normal Power-up	A-4
Problem Solving Using the LEDs	A-5

---

## 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), and can change color (green or yellow) depending on the operational status of the module or the level of activity on the network.

Table A-1 shows the states that are possible for each of the module's LEDs.

**Table A-1: Module LED States**

LED Name	Off	On (Green)	On (Yellow)	Flashing
Power	No power to module.	Module receiving power.	N/A	N/A
Module OK	Self-test failed.	Module passed self-test.	N/A	Fan failure.
Network OK	Module is not connected to a properly terminated and operational LAN through the ThinWire port on the DEChub 900 or through the AUI port on the DEChub ONE, or there is repeater loop.	Module is connected to a properly terminated and operational LAN through the ThinWire 10Base2 port on the DEChub 900 or through the AUI port on the DEChub ONE.	N/A	ThinWire port on DEChub 900 or the AUI port on the DEChub ONE is disabled by network management.

## LED Descriptions

<b>LED Name</b>	<b>Off</b>	<b>On (Green)</b>	<b>On (Yellow)</b>	<b>Flashing</b>
Port State	Bad or no connection.	Port is connected to another operational network device.	N/A	The associated port is disabled by network management.
Bank Indicator	Associated bank is not currently displaying its port connection status on the 8 port state LEDs.	Associated bank is currently displaying its port connection status on the 8 port state LEDs	N/A	N/A
Internal LAN	No activity.	Internal LAN exists only on the module.	The internal LAN is connected to the flexible channel on the DEChub 900 backplane.	Network traffic increases on the associated LAN.

## Normal Power-up

---

### Normal Power-up

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

<b>Event</b>	<b>Description</b>
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. Flashing Port State LEDs and activity LEDs indicate that the module is running various subroutines as part of the self-test.
3	After the successful completion of self-test, the Module OK LED lights, and remains lit.
4	The remaining LEDs now indicate their operational status, as described in Table A-2.

---

## Problem Solving Using the LEDs

When diagnosing a problem with the module, note that the problem is often indicated by the states of the module's LEDs. Table A-2 lists the states of the LEDs for various error conditions that can occur during initial installation of the device, along with probable causes and corrective actions to take.

**Table A-2: Problem Solving Using the LEDs**

Symptom	Probable Cause	Corrective Action
Power LED is off.	Bad power LED.	Replace the module.
	The module is not receiving +5.0 V.	Check the power LED on the DEChub 900 MultiSwitch power supply.
	If the power LED on the DEChub power supply is off, then there is a problem with the DEChub power supply.	See the troubleshooting procedures in the <i>DEChub 900 MultiSwitch Owner's Manual</i> .
	If the power LED on the DEChub power supply is on and the other power LED components are off, then the DEChub has a power problem.	See the troubleshooting procedures in the <i>DEChub 900 MultiSwitch Owner's Manual</i> .
	If the power LED turns on when reseated in the same slot, then the module was not properly seated.	Make sure the module is properly seated in the slot.
If the power LED turns on when reseated in another slot, then the problem is with the DEChub.	See the troubleshooting procedures in the <i>DEChub 900 MultiSwitch Owner's Manual</i> .	

*continued on next page...*

## Problem Solving Using the LEDs

Symptom	Probable Cause	Corrective Action
Power LED is off ( <i>cont.</i> )	If the module does not turn on in a known good slot, then the module is defective.	Replace the module.
Module OK LED is off.	Self-test in progress.	Wait for self-test to complete.
	Self-test failed.	If the LED does not light after 5 seconds, reseal the module to repeat the self-test. If the self-test fails again, replace the module.
Module OK is flashing.	Fan is faulty.	Replace the fan. Contact your Digital representative.
Network OK LED is off.	There is a repeater loop.	Check the redundant links for proper configuration. Check clearVISN for a configuration error.
Port State LED is off.	Associated port is not properly connected to another operational network device.	Properly connect the associated port to network or station. Reset the cable. If problem persists, replace the cable.
Port state LED is flashing.	Port is disabled by management.	Enable the port, if necessary. Use clearVISN to check the security log.
Internal LAN LEDs are off.	No front panel ports are mapped to an internal LAN, or there is no network traffic.	N/A

## Appendix B

---

# Connector Assignments and Adapters

---

### Overview

#### Introduction

This appendix shows detailed illustrations of the connectors, and their pin assignments, and adapters used on the PORTswitch 900TP/12. It also discusses the internal and external crossover configurations.

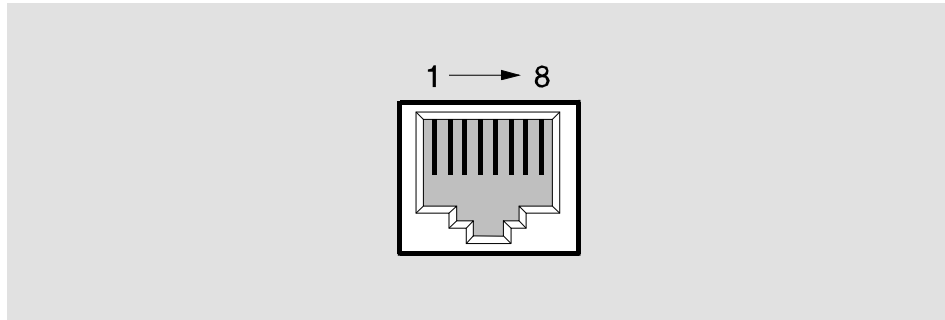
#### In This Appendix

Topic	Page
Connector Assignments	B-2
Adapters	B-3
Internal and External Crossover Configurations	B-4

## Connector Assignments

Figure B-1 shows the 8-pin MJ crossover connector and its pin assignments. A crossover function must be implemented in every twisted-pair link. The crossover function (internal or external) allows the transmitter of one device to connect to the receiver of the device at the other end of the twisted-pair link.

**Figure B-1: 8-pin MJ Connector**



NPG-8719-95F

**Table B-1: 8-pin MJ Connector Pin Assignments**

Table B-1 lists the pin assignments for the 8-pin MJ connector.

Pin	Assignment	Pin	Assignment
1	Rx+	5	Unused
2	Rx-	6	Tx-
3	Tx+	7	Unused
4	Unused	8	Unused

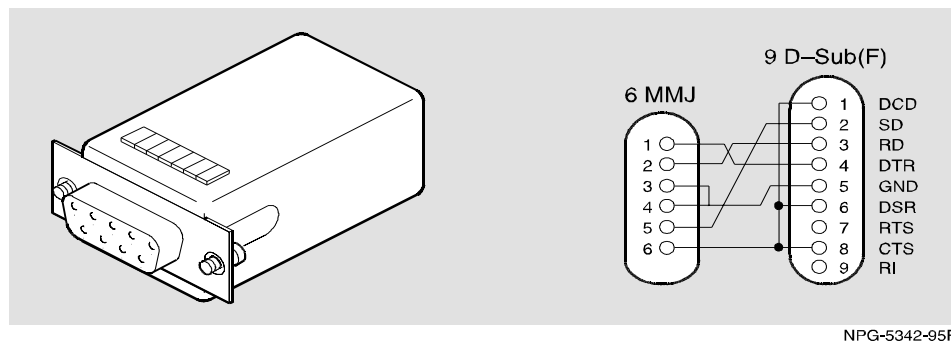


## Adapters

### H8571-J Adapter

Figure B-2 shows the H8571-J adapter (6-pin MMJ to 9-pin D-sub connector) and its pin assignments.

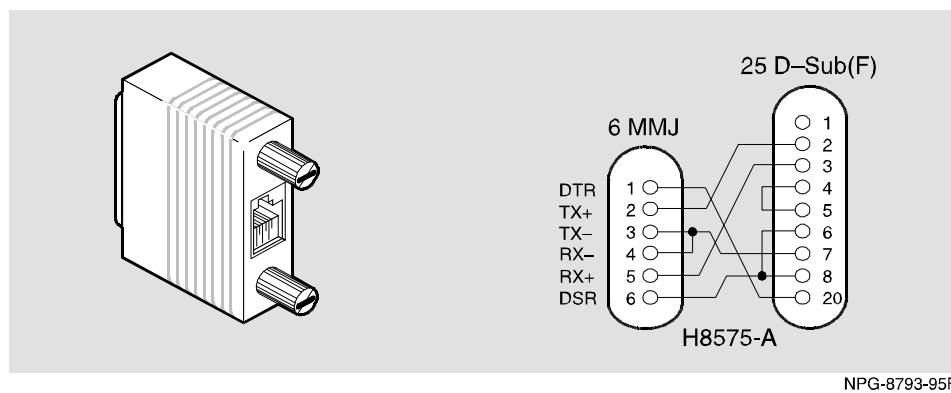
**Figure B-2: H8571-J Adapter**



### H8575-A Adapter

Figure B-3 shows the H8575-A adapter (6-pin MMJ connector to 25-pin D-sub connector) and its pin assignments.

**Figure B-3: H8575-A Adapter**



## Internal and External Crossover Configurations

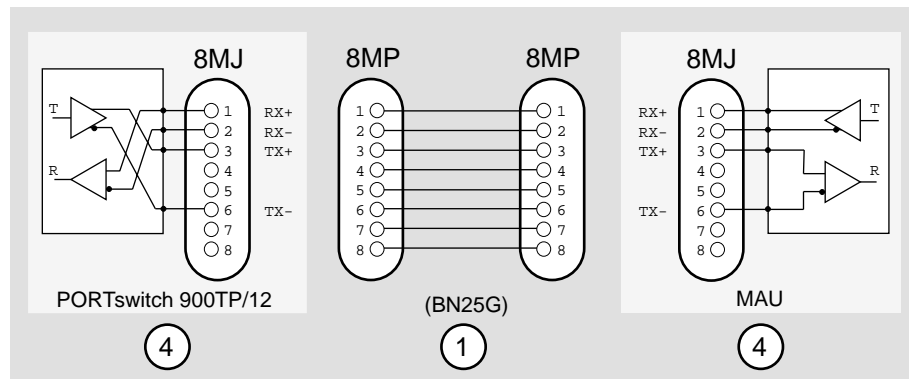
A crossover function must be implemented in every twisted-pair link. The crossover function (internal or external) allows the transmitter of one device to connect to the receiver of the device at the other end of the twisted-pair link.

Figure B-4 shows the use of straight-through (1) and crossover cables (2) for connecting crossover (3) and straight-through (4) types of devices. The PORTswitch 900TP/12 uses straight-through connectors.

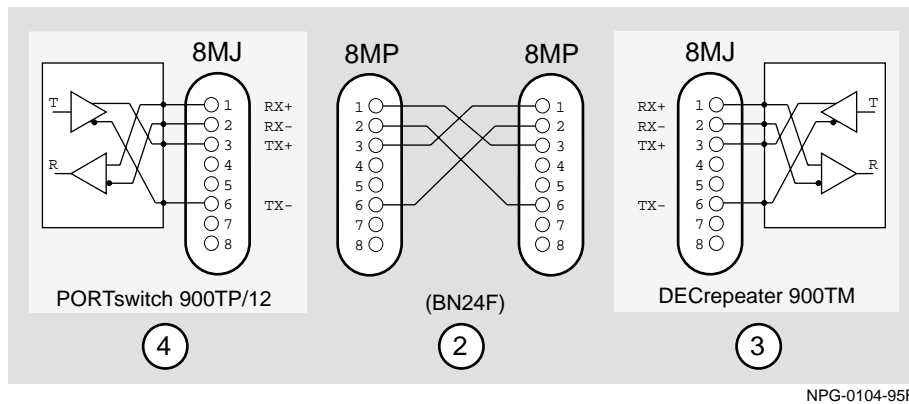
Digital uses straight-through connectors on each PORTswitch 900TP/12 port because each port is a bridge for connection to shared LAN devices (repeaters). Repeaters are specified by IEEE 802 to provide this crossover function.

## Internal and External Crossover Configurations

**Figure B-4: Internal Crossover Configuration**



**Figure B-5: External Crossover Configuration**





# Appendix C

---

## Product Specifications

---

### Overview

#### Introduction

This appendix lists the specifications and available connectors for the PORTswitch 900TP/12.

#### In This Appendix

Topic	Page
Product Specifications	C-2
Acoustical Specifications	C-3
Connectors	C-4

## Product Specifications

Table C-1 lists the product specifications for the module.

**Table C-1: Product Specifications**

Parameter	Specification
<b>Environment</b>	
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	34.0 W, total power
	5.3 A, 5Vdc
	0.1 A, 12Vdc
	0.5 A, 15Vdc
<b>Physical</b>	
Height	44.45 cm (17.5 in)
Width	4.45 cm (1.75 in)
Depth	15.25 cm (6 in); 25.40 cm (10.0 in) when installed as a standalone unit
Weight	1.8 Kg (4 lb) <sup>2</sup>
<b>Shock (Class A/B for products weighing under 100 lbs)</b>	10 G / 10 ms half sine pulse in three orthogonal axes
<b>Vibration (Class C)</b>	5 to 200 Hz sine sweep @ 0.25 G limited by 0.02" (0.5mm) displacement DA* 200 to 500 Hz sine sweep @ 0.10 G
<b>Certification</b>	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 3200 ft.

<sup>2</sup> Actual module (no shipping container). Include an additional 1.59 Kg (3.5 lb) when attached to a DEChub ONE docking station.

## Acoustical Specifications

Table C-2 lists the acoustical specifications for the module.

**Table C-2: Acoustical Specifications**

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

Product	Sound Power Level $L_{WAd}$ , B	Sound Pressure Level $L_{pAm}$ , dBA (bystander positions)
	Idle/Operate	Idle/Operate
DETPX-MA PORTswitch 900TP/12	4.9	35
DETPX-MA + DEHUA PORTswitch 900TP/12 DEChub ONE	5.2	39
DETPX-MA + DEF1H PORTswitch 900TP/12 DEChub ONE-MA	5.3	39

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

**Schallemissionswerte Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779<sup>2</sup>**

Produkt	Schalleistungspegel $L_{WAd}$ , B	Schalldruckpegel $L_{pAm}$ , dBA (Zuschauerpositionen)
	Leerlauf/Betrieb	Leerlauf/Betrieb
DETPX-MA PORTswitch 900TP/12	4,9	35
DETPX-MA + DEHUA PORTswitch 900TP/12 DEChub ONE	5,2	39
DETPX-MA + DEF1H PORTswitch 900TP/12 DEChub ONE-MA	5,3	39

<sup>2</sup> Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich. 1 B = 10 dBA.

---

## Connectors

Table C-3 lists the connectors for PORTswitch 900TP/12, DEChub ONE, and DEChub ONE-MX.

**Table C-3: Connectors for the PORTswitch 900TP/12**

Connectors	Quantity
<b>PORTswitch 900TP/12</b>	
Shielded 8-pin MJ (10BaseT ports) with straight through connectors	
<b>DEChub ONE</b>	
8-pin MJ (setup port)	1
DB-9 (OBM)	1
15-pin D-sub (AUI Connector)	1
<b>DEChub ONE-MX</b>	
8-pin MJ (setup port)	1
6-pin MJ (OBR)	1
6-pin MJ (OBR)	1
DB-(OBM)	1
15-pin D-sub (AUI)	1
Redundant power connector (D-sub)	1
MOD PMD slots	2



## Appendix D

---

# Accessing and Configuring RMON Groups

---

## Overview

### Introduction

This appendix describes how to access the four RMON groups and how to configure the Alarms and Events groups.

### In This Appendix

Topic	Page
What Is RMON?	D-2
Groups Supported	D-3
How to Access RMON Groups	D-4

What Is RMON?

---

## What Is RMON?

RMON is a Remote Network Monitoring Management Information Base (RMON MIB). RMON gathers a wide variety of statistical information about network operation. A typical network consists of multiple network segments with one RMON agent connected to each segment. RMON gathers this information by examining each packet passed on a network segment. Segment statistics are stored in counters within the module. The counters are continuously updated and reset at powerup.

RMON also captures and stores network traffic information. RMON allows you to examine these captured packets or sequences of packets to identify and isolate network operational software or hardware problems.

A list of RMON features is described in Chapter 1.

---

### NOTE

The online help includes management tasks and information for the RMON Manager application.

---

---

## Groups Supported

The four RMON groups supported by this module are Statistics, History, Alarms, and Events. The following table defines these four groups:

<b>This group...</b>	<b>Allows you to...</b>
Statistics	Obtain an array of operational statistics including: <ul style="list-style-type: none"> <li>• Packets</li> <li>• Octets</li> <li>• Broadcasts</li> <li>• Collisions</li> <li>• Dropped packets</li> <li>• Fragments</li> <li>• CRC alignment errors</li> <li>• Undersize/oversize packets</li> <li>• Multicasts</li> <li>• Jabbers</li> <li>• 64 octet packets</li> <li>• 65 to 127 octet packets</li> <li>• 128 to 255 octet packets</li> <li>• 256 to 511 octet packets</li> <li>• 512 to 1023 octet packets</li> <li>• 1024 to 1518 octet packets</li> </ul>
History	Obtain a historical representation of statistics for individual ports for customized trend analysis.
Alarms	Set a wide variety of thresholds and sampling intervals on any statistic to create an alarm condition. An alarm will cause an event. You may set threshold values as: <ul style="list-style-type: none"> <li>• An absolute value</li> <li>• A rising value</li> <li>• A falling value</li> <li>• A delta value</li> </ul>
Events	Create entries in the monitor log and generate SNMP traps for selected events. You can initiate events by setting an alarm on any counter. The log includes a description and the time of each event.

---

## How to Access RMON Groups

This section provides you with procedures that describe how to access the RMON Groups.

---

<b>RMON Group</b>	<b>To Access, use these Groups...</b>
Statistics and History	Use the clearVISN MultiChassis Manager
Alarms and Events	Use any SNMP network manager, as described later in this document

---

### Accessing Statistics and History

To access the Statistics and History groups, you must manage each of these groups using the clearVISN MultiChassis Manager as follows:

---

<b>Step</b>	<b>Action</b>
<b>1</b>	Run the clearVISN MultiChassis Manager.
<b>2</b>	Double click on the PORTswitch 900TP/12 module. (The summary screen displays the module's summary.)
<b>3</b>	Click on the RMON button to display the Statistics screen.
<b>4</b>	Click on the HISTORY button on the Statistics screen.

---

For additional Statistics and History information refer to online help.

### Accessing Alarms and Events

This section describes how to set up a condition to be monitored (an alarm) and an event to be generated once that condition has occurred. You use an SNMP network manager to set up conditions and events. For a more complete description of the alarmTable and eventTable, refer to RFC 1757: S. Waldbusser, "Remote Network Monitoring Management Information Base," 02/10/1995.

The event group consists of the eventTable and the logTable. The alarmTable contains configuration entries that define a variable, polling period, and threshold parameters.

If an entry is found to have crossed the threshold value, an event is generated that is processed as specified by your entries in the eventTable. Thus, the eventTable controls the generation and notification of events from the device.

## How to Access RMON Groups

The RMON Alarms and Events MIB objects eventDescription, alarmOwner, and eventOwner support up to 127 characters. MIB object eventCommunity supports up to 32 characters. The maximum number of entries that can be placed in the alarmTable is 20. For the eventTable, the maximum is 32.

### Alarm and Event Table Entries

Alarm table entries can only be created for SNMP Integer MIB variables of the following types:

- INTEGER
- Counter
- Gauge
- TimeTicks

The following tables list and define the fields that make up an alarm table entry and an event table entry.

## How to Access RMON Groups

**Table D-1: Alarm Table Entry Fields**

<b>Alarm Table Entry Fields</b>	<b>Definition</b>
alarmIndex	An index that uniquely identifies an entry (see note below).
alarmInterval	The interval, in seconds, over which the data is sampled and compared with the rising and falling threshold.
alarmVariable	The object identifier of the particular variable to be sampled.
alarmSampleType	The method of sampling the selected variable and calculating the value to be compared against the thresholds.
alarmValue	The value of the statistic during the last sampling period (see note below).
alarmStartupAlarm	The alarm that may be sent when this entry is first set to valid.
alarmRisingThreshold	Rising (increasing) threshold for the sampled statistic.
alarmFallingThreshold	Falling (decreasing) threshold for the sampled statistic.
alarmRisingEventIndex	The index of the eventEntry that is used when a rising threshold is crossed.
alarmFallingEventIndex	The index of the eventEntry that is used when a falling threshold is crossed.
alarmOwner	The person who configured this entry and is therefore using the resources assigned to it.
alarmStatus	The status of this alarm entry.

---

### **NOTE**

The alarmIndex and alarmValue objects are read-only. You cannot set these fields. The alarmIndex is implicitly specified when the entry is created. The alarmValue is made available after the current sampling period.

---

**Table D-2: Event Table Entries**

<b>Event Table Entry Fields</b>	<b>Definition</b>
eventIndex	An index that uniquely identifies an entry (see the following note).
eventDescription	A comment describing this event.
eventType	The type of notification that will occur when the threshold is being reached.
eventCommunity	If an SNMP trap is to be sent, it will be sent to the SNMP community specified.
eventLastTimeSent	The value of sysUpTime at the time this event entry last generated an event (see the following note).
eventOwner	The person who configured this entry and is therefore using the resources assigned to it.
eventStatus	The status of this event entry.

---

**NOTE**

The eventIndex and eventLastTimeSent objects are read-only. You cannot set these fields. The eventIndex is implicitly specified when the entry is created. The eventLastTimeSent is made available after the current sampling period.

---

How to Access RMON Groups

## How Traps Work

SNMP-managed devices are able to send trap messages to network management stations. You configure the IP addresses of NMS “trap sinks” that are to receive the RMON trap messages. For additional information on traps, refer to RFC 1215: M. Rose, "A Convention for Defining Traps for use with the SNMP," 03/27/1991.

The trap IP address can be configured on all DEChub 900 modules through the device's set-up port. With the exception of the DECserver 900 products, the trap IP address can also be added via SNMP set-requests to the device's private MIB (pcomSnmpAuthTrapAddressTable).

You can specify that when an alarm condition is reached, a trap is generated and sent to the trap sinks specified. For additional information on how to specify trap generation, refer to eventType RFC 1757: S. Waldbusser, "Remote Network Monitoring Management Information Base," 02/10/1995.



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