# RouteAbout Central EI

# Installation and Configuration

Part Number: EK-DEZBR-IN. A01

**December 1996**

This manual describes how to install and configure the RouteAbout Central EI.

**Revision/Update Information:** This is a new document.

**FCC Notice** — Class A Computing Device:
This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference. Any modifications to this device - unless expressly approved by the manufacturer - can void the user's authority to operate this equipment under part 15 of the FCC rules.

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This equipment is in the 1st Class category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas. Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers. Read the instructions for correct handling.

**CE Notice** — Class A Computing Device:

**Warning!**
This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

**Achtung!**
Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

**Attention!**
Ceci est un produit de Classe A. Dans un environment domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

**Warning! (for Australia only)**
This customer equipment is to be installed and maintained by service personnel as defined by AS/NZS 3260 Clause 1.2.14.3. Service Personnel. Incorrect connection of connected equipment to the General Purpose Outlet could result in hazardous situation.
Safety requirements are not fulfilled unless the equipment is connected to a wall socket outlet with protective earth contact.

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# Preface

## Overview

### Purpose of This Document

This manual describes how to install and set up the RouteAbout Central EI module. It also provides problem solving information, connector pin assignments, and other general information.

### Intended Audience

This manual is intended for use by personnel who will install and set up the RouteAbout Central EI.

# Organization

This manual is organized as follows:

| Section | Description |
|---|---|
| Chapter 1 | Provides an overview of the RouteAbout Central EI and describes its features. |
| Chapter 2 | Provides instructions for installing the RouteAbout Central EI in a DEChub 900 MultiSwitch. |
| Chapter 3 | Provides instructions for installing the setup port cable on the RouteAbout Central EI. |
| Chapter 4 | Describes how to configure the RouteAbout Central EI when it resides in a DEChub ONE. |
| Chapter 5 | Describes how to configure the RouteAbout Central EI when it resides in a DEChub 900 MultiSwitch. |
| Chapter 6 | Defines what you will need to support ISDN. |
| Chapter 7 | Describes how to configure the ISDN port. |
| Chapter 8 | Describes how to remove the RouteAbout Central EI from the DEChub 900 MultiSwitch. |
| Appendix A | Provides installation-specific problem solving information using the LEDs. |
| Appendix B | Describes connectors, adapters, pin assignments and cable connections. |
| Appendix C | Contains installation information required for the United Kingdom. |
| Appendix D | Provides product specifications and a parts list. |

# Conventions and Terms

## Overview

This book uses the following conventions.

| Convention | Description |
|---|---|
| `Special Type` | This special type in examples indicates system output. |
| **Boldface** | Boldface type in examples indicates user input. |
| <Return> | Indicates that you should press the Return key. |

## Terms Used in This Manual

This book uses the following terms:

| Term | Definition |
|---|---|
| Basic Rate | A specific ISDN offering providing users with two 64Kb/s data channels (e.g. “B” channels) and one 16Kb/s signalling channel (e.g. “D” channel). |
| Ethernet | Digital’s term for its product compatibility with ISO 8802-3/ANSI/IEEE 802.3 standards and the Ethernet standards for CSMA/CD local area networks (LANs). |
| ISDN | Integrated Services Digital Network, a telco industry service providing users with digital connections to the telephone network. |
| SNMP | Simple Network Management Protocol, an industry standard protocol for network management. |
| ThinWire Cable | IEEE 10Base2 coaxial cable that carries Ethernet signals. |
| WAN | Wide Area Network. A generic term used to identify serial links which traverse large geographic areas. |

# Associated Documents

The following documents provide related information about the module. For information on how to order additional documentation, see the ordering information provided in this preface.

| Title and Order | Description |
|---|---|
| *Bridging Configuration Guide*<br>AA-QL29D-TE | Describes bridging methods, operational features of bridging, configuration methods and basic configurations, and monitoring of bridging software. |
| *DEChub 900 MultiSwitch Owner's Manual*<br>EK-DH2MS-OM | Provides installation, use, security, and troubleshooting information for the DEChub 900 MultiSwitch. |
| *DEChub ONE Installation*<br>EK-DEHU2-IN | Provides installation and operation guidelines for standalone module configuration, including mounting options and cabling. |
| *Event Logging System Messages Guide*<br>AA-QL2ACD-TE | Describes messages logged by the Event Logging System. |
| *Network Interface Operations Guide*<br>AA-QL2BD-TE | Describes the configuring and monitoring of the network interfaces in the Distributed Routing Software. |
| *Distributed Routing Software Routing Protocols Reference Guide*<br>AA-QL2CD-TE | Provides detailed reference information about the micro-operating system structure and the protocols and interfaces that the bridging routers support. |
| *Distributed Routing Software Routing Protocols Users Guide*<br>AA-QL2DD-TE | Explains how to configure and monitor the routing protocol software. |
| *System Software Guide*<br>AA-QL2ED | Describes the installation, configuration, and operation of the Distributed Routing Software. |
| *SNA Configuration Guide*<br>AA-QU5SB-TE | Describes SNA configuration. |

| Title and Order | Description |
|---|---|
| *clearVISN Installation*<br>AA-QX876B-TK | Provides pre- and post-installation information, as well as actual installation procedures for each application. |
| *clearVISN Product Overview*<br>AA-QX87B-TK | Provides an overview of clearVISN, an explanation of each application and descriptions of all concepts necessary to understand and use the application efficiently. |
| *clearVISN Configuration and Use*<br>*AA-QX88B-TK* | Provides information for starting each application, configuring them and general use information. |

# 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 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 |

# How to Order Additional Documentation

To order additional documentation, use the following information:

| To Order: | Contact: |
|---|---|
| By Telephone | Continental USA: 1-800-DIGITAL (1-800-344-4825)<br>Canada: 1-800-267-6215<br>Alaska, New Hampshire, and Hawaii: 1-603-884-6660 |
| Electronically (USA. only) | Dial 1-800-DEC-DEMO<br>(For assistance, call 1-800-DIGITAL) |
| By Mail (USA and Puerto Rico) | DIGITAL EQUIPMENT CORPORATION<br>P.O. Box CS2008<br>Nashua, New Hampshire 030601-1260<br>(Place prepaid orders from Puerto Rico with the local Digital subsidiary: 809-754-7575) |
| By Mail (Canada) | DIGITAL EQUIPMENT CORPORATION LTD.<br>940 Belfast Road<br>Ottawa, Ontario, Canada K1G 4C2<br>Attn: A&SG Business Manager |
| Internationally | DIGITAL EQUIPMENT CORPORATION<br>A&SG Business Manager<br>c/o local Digital subsidiary or approved distributor |
| Internally | U.S. Software Supply Business (SSB)<br>DIGITAL EQUIPMENT CORPORATION<br>10 Cotton Road<br>Nashua, New Hampshire 030601-1260 |

# Safety

## Overview

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

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

| | |
|---|---|
| **CAUTION** | This action deletes all configured settings and replaces them with factory default values. All configuration settings will be lost. |
| **ACHTUNG** | Bei diesem Vorgang werden alle Konfigurationseinstellungen gelöscht und die Werkseinstellungen wieder eingesetzt. Alle Konfigurationsdaten gehen verloren. |
| **ATTENTION** | Cette action supprime tous les paramètres de configuration et les remplace par des valeurs prédéfinies. Tous les paramètres de configuration seront perdus. |
| **PRECAUCIÓN** | 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. |

# Chapter 1

# Product Introduction

## Overview

### Introduction

This chapter provides a description of the RouteAbout Central EI module and its features.

### In This Chapter

# What is the RouteAbout Central EI?

The RouteAbout Central EI is a central site bridge/router (also referred to in this manual as the module) that provides multiprotocol routing for linking remote sites through its wide area network (WAN) connections.

The module can be configured in the DEChub 900 MultiSwitch 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 RouteAbout Central EI is available with the following two protocol packages:

- Internet Protocol (IP)
- Multiprotocol (MP)

The IP package supports TCP/IP routing and bridging. The MP package supports IP, bridging, IPX, AppleTalk, DECnet Phase IV, and OSI.

The RouteAbout Central EI has two independent Ethernet ports, four synchronous WAN ports capable of T1/EI rates, and twelve Basic Rate ISDN ports. The Ethernet ports can be switched to the front panel or to the DEChub MultiSwitch 900 matrix channels.

The RouteAbout Central EI standards-compliant technology (IEEE 802.1d, 802.2, and 802.3) ensures operability in multivendor networks.

# Features

Your RouteAbout Central EI router module includes the following features.

## Hot Swap

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

## Performance and Memory

The RouteAbout Central EI contains the following performance and memory features:

- Implements industry-standard processors operating at 25 Mhz clock rates, and utilizes 32-bit address and data buses for maximum bus bandwidth.
- 8 Mbytes of system memory using PC compatible memory DSIMMS.
- Memory accesses are parity protected on a byte wide basis.

## Configuration and Management

The following configuration and management options are available:

- Support for configuration and management through a command line interface in two ways:
  - — locally via the setup port in a DEChub ONE docking station or the DEChub 900 (in a DEChub 900, you must redirect the hub setup port to the module)
  - — remotely via Telnet in both the DEChub 900 and the DEChub ONE
- Upgradeable device firmware (in nonvolatile Flash memory) using Trivial File Transfer Protocol (TFTP).
- Out-of-Band Management (OBM) over Serial Line Internet Protocol (SLIP) through the OBM connector as an alternative to in-band management.
- Support using LAN hopping and launching of Telnet windows via Digital's clearVISN MultiChassis Manager product.
- Simple Network Management Protocol (SNMP) for monitoring.
- In a DEChub ONE docking station, the option to direct the port 2 Ethernet channels either to the DEChub ONE's AUI port or to the RouteAbout Central EI's front panel.
- Ports are individually switchable with clearVISN MultiChassis Manager.
- Supports product environmental management features, including automatic fan speed control, overtemperature warning and overtemperature shutdown.

## EasyStart

EasyStart is a feature that allows you to downline load configuration files that are stored on a central server. The configuration files are identified by the MAC address of a LAN interface on the Router.

Using EasyStart eliminates the need for an initial configuration via the console port. When the module is booted, it autoconfigures all interfaces and sends out requests to load its configuration file. Once the file is received, the module automatically restarts so that the configuration parameters specified in the file take effect.

See the *System Software Guide* for information about using the EasyStart feature.

## Bridging

The following bridging options are supported:

- Spanning tree loop detection protocol IEEE 802.1d.
- Ability to enable or disable spanning tree algorithm on individual Ethernet ports.
- High-speed local traffic filtering and forwarding.
- Flexible filtering (source address, destination address, and protocol) for greater network control, increased security and bandwidth utilization, and reduced propagation of network problems.
- Option to turn off automatic learning and manually load the address database.

## Routing Protocols

The following routing protocols are supported:

- IP protocols, which are as follows:
  - OSPF (Open Shortest Path First)
  - RIP (Routing Information Protocol)
  - BGP-4 (Border Gateway Protocol)
  - EGP (Exterior Gateway Protocol)
  - IS-IS (Integrated Intermediate System to Intermediate System)
  - MOSPF (Multicast Open Shortest Path First)
  - PIM (Protocol Independent Multicast)
  - DVMRP (Distance Vector Multicast Routing Protocol)
- IPX
- AppleTalk Phases I & II
- DECnet Phase IV
- DECnet/OSI
- Data Link Switching (DLSw)
- SDLC Relay
- Boundary Access Node
- X.25 Switching

## SNMP

The complete MIB-II is provided with the exception of ifInNUcastPkts, ifOutNUcastPkts, and the TCP group. SNMP Gets and Traps are supported for the following RFCs.

- Structure and Identification of Management Information for TCP/IP-based Internets (RFC 1155)
- SNMP management (RFC 1157)
- Management Information Base for Network Management of TCP/IP-Based Internets: MIB-II (RFC 1213)
- AppleTalk MIB (RFC 1243)
- OSPF Version 2 MIB (RFC 1253)
- Bridge MIB (RFC 1286)
- Frame Relay DTE MIP (RFC 1315)
- RS232-Like Hardware Device MIP (RFC 1317)
- PPP Link COntrol Protocol MIP (RFC 1471)
- Evolution of the Interfaces Group of MIP-II (RFC 1573)
- Ethernet MIB (RFC 1623)
- SDLC MIB (RFC 1747)
- Bandwidth Reservation System Private MIB
- Distributed Routing Software Private MIB
- Data Link Switching (DLSw) MIB (Internet Draft Version 06)
- LLC MIB (Internet Draft Version 01)
- Novell IPX MIB
- Novell RIP-SAP MIB

Sets are supported for enabling and disabling router interfaces. The address translation and routing tables are not settable.

Manageability using any generic SNMP management application that supports the MIBs listed above.

# Chapter 2

# Installing the RouteAbout Central EI

## Overview

### Introduction

This chapter describes the front and back panel components of the RouteAbout Central EI and tells you how to install the module.

To install a module in a DEChub ONE docking station refer to the *DEChub ONE Installation* manual.

### In This Chapter

## Module Components

The following sections describe the front and back panel components for the RouteAbout Central EI.

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

Table 2-2 describes the back panel components, as illustrated in Figure 2-2.

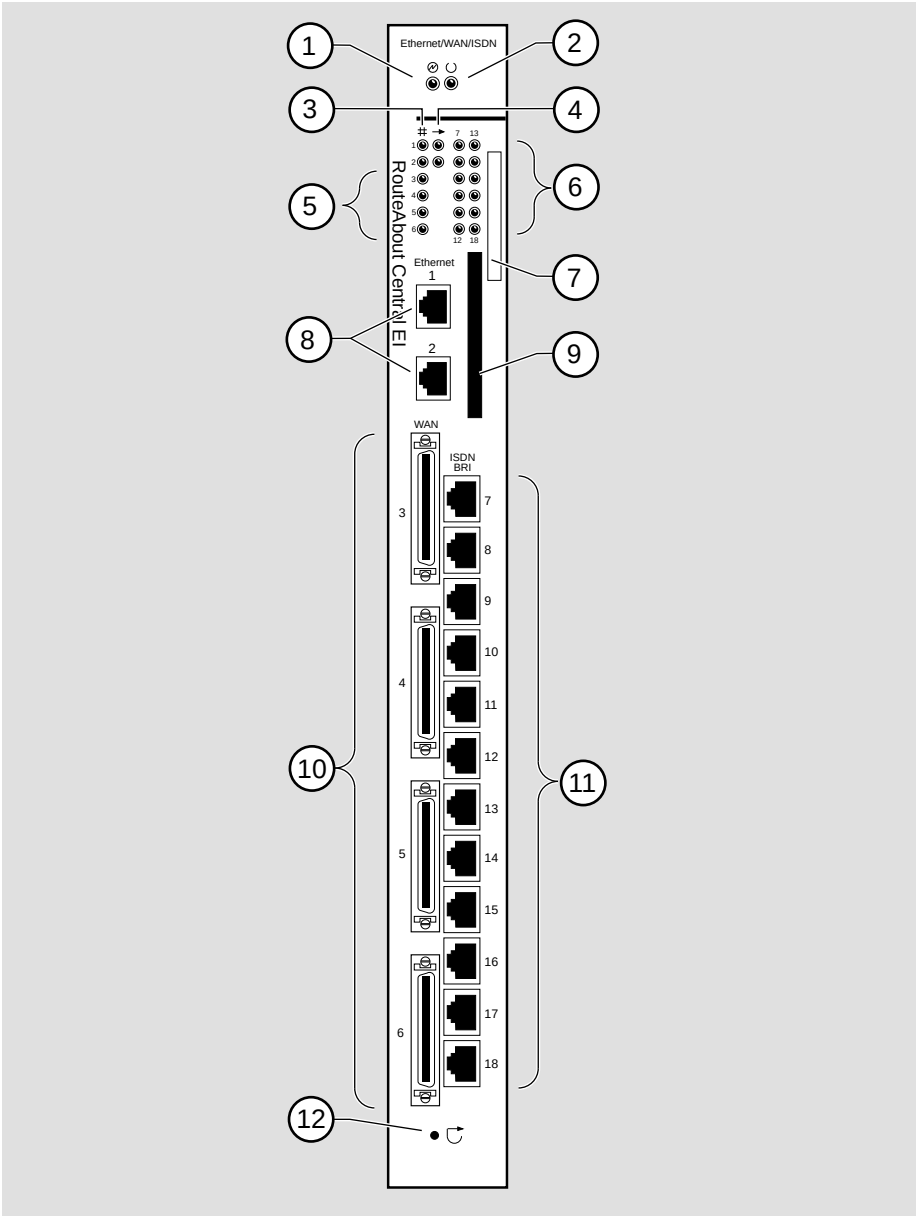
For problem-solving information using the LEDs, refer to Appendix A.

**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 LEDs 1 and 2 | Indicates network connection or port state. |
| 4 |  | Network Activity LED 1 | Indicates network traffic connection through the front or back (for example either through the DEChub 900 MultiSwitch thinwire channel or one of the six flex channels). Blinks faster as traffic becomes heavier. |
| |  | Network Activity LED 2 | Indicates network traffic, connection through the front, or if in a DEChub ONE, the connection is through the AUI port or connection through one of the six DEChub 900 MultiSwitch flex channels. |
| 5 | | Port 3-6 Serial Line OK LED | Indicates operation mode on ports 3 to 6. |
| 6 | | ISDN Ports 7-18 | Indicates operation mode on ports 7 to 18. |
| 7 | | Ethernet Label | Lists the Ethernet address of the module. |
| 8 | | Twisted Pair (10BaseT) Connector | Connects the module to a 10BaseT network. |
| 9 | | PCMCIA Slot | Reserved for Digital Use Only. |
| 10 | | Synchronous Serial Port Connections (labeled 3 through 6) | These ports support the EIA530A, RS232/V.28, RS422/V.11, V.35, X.21 Leased Lines (LL), RS423/V.10 |

| | | | |
|---|---|---|---|
| 11 | | ISDN BRI Port Connections (labeled 7 through 18) | These ports support the S/T interface Basic Rate ISDN connections. |
| 12 |  | Dump Button | Reserved for Digital Use Only. |

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

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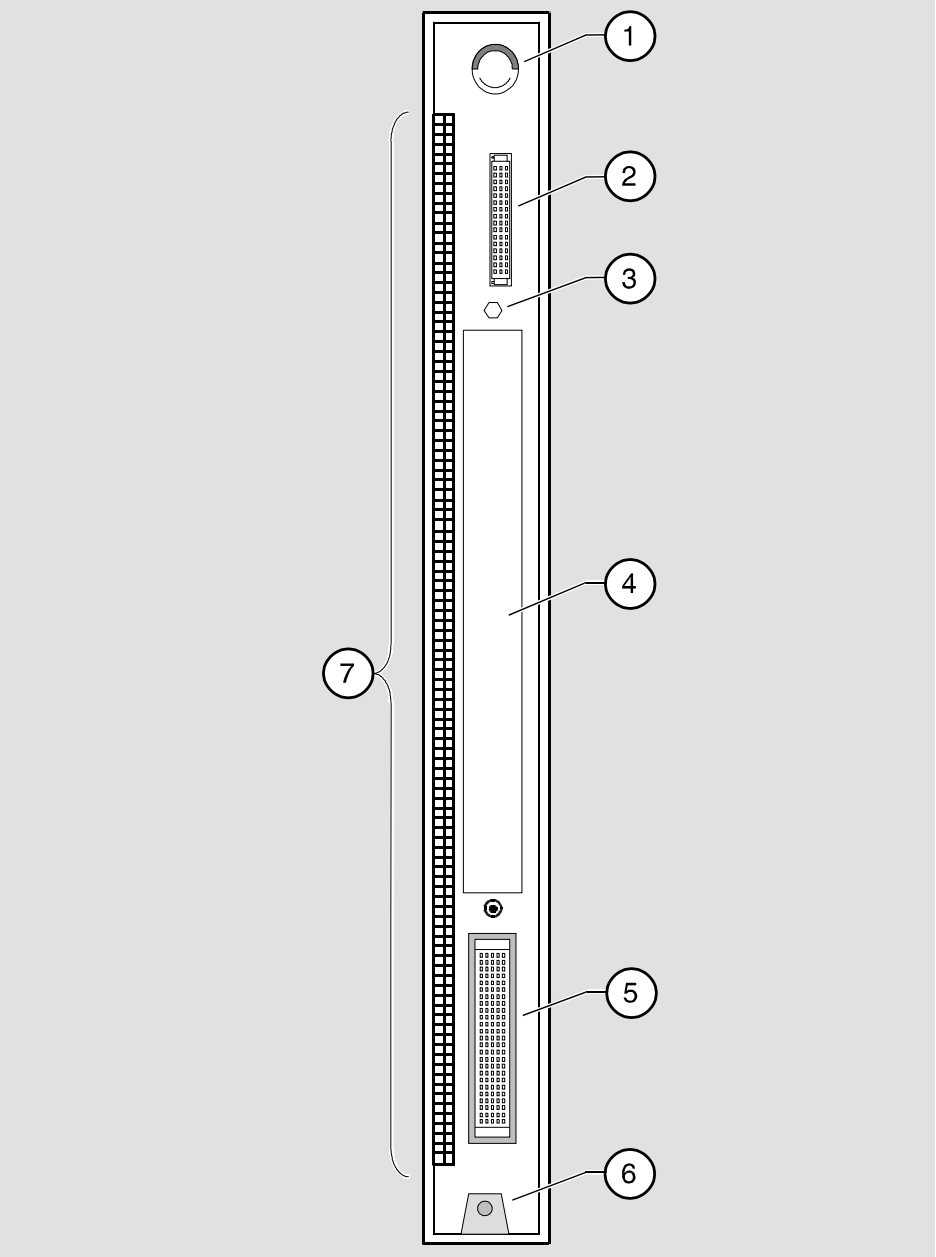
## Back Panel

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

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

| Item | Name | Description |
|---|---|---|
| 1 | Locking tab | Locks the module into a DEChub 900 backplane or into a DEChub ONE docking station. Contains the hot-swap switch lever. |
| 2 | 48-pin connector | Provides network and power connections to the module when the module is installed in a DEChub 900 or DEChub ONE docking station. |
| 3 | Grounding bolt | Provides a chassis grounding connection between the module and the DEChub 900 or the 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 when it 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. |

**Figure 2-2: Back Panel Layout**

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## How to Install the Module

The hotswap feature allows you to install the module into the DEChub 900 MultiSwitch without turning off power. Seating the module initiates the power-up.

To install the module, complete the following tasks.

| Task | Description |
|---|---|
| **1** | Compare the power ratings. |
| **2** | Seat the module into the DEChub 900. |
| **3** | Verify initial LED operation. |
| **4** | Connect the cables. |

## Task 1: Compare the Power Ratings

Compare your module's power requirements with the values shown in the Hub Manager status display (Figure 2-3).

If any of the module's power requirements **(1)** exceed the values shown in the status display **(2)**, add another power supply (see the *DEChub 900 MultiSwitch Owner's Manual*).

---

**NOTE**

The 12V power in the DEChub 900 is derived from the 15V power source. Although it is listed separately in the product specifications, the 12V requirements are included in the 15V power total.

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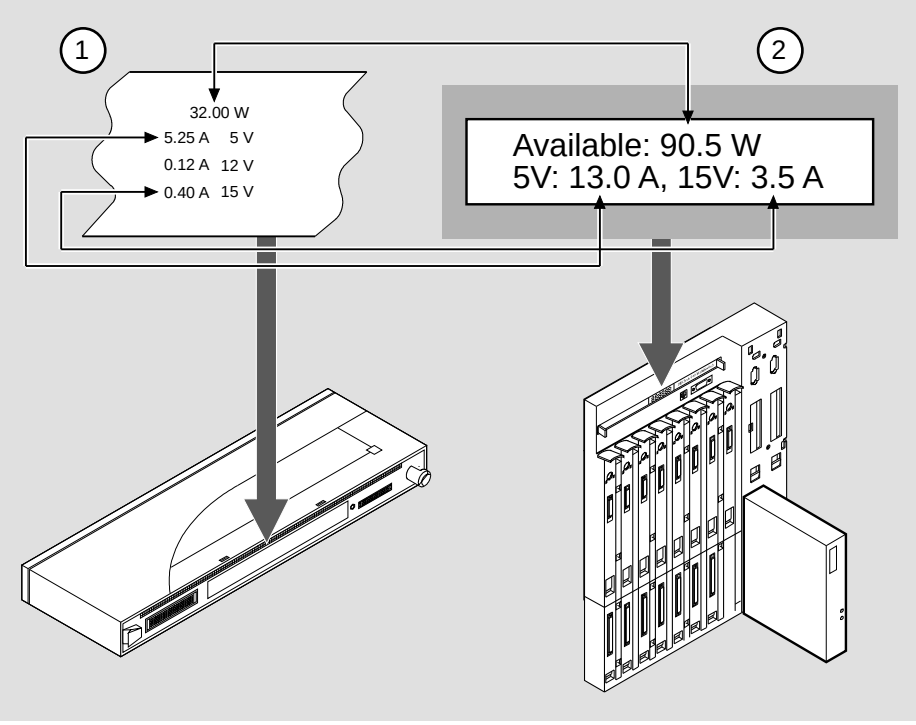
**Figure 2-3: Power Ratings**

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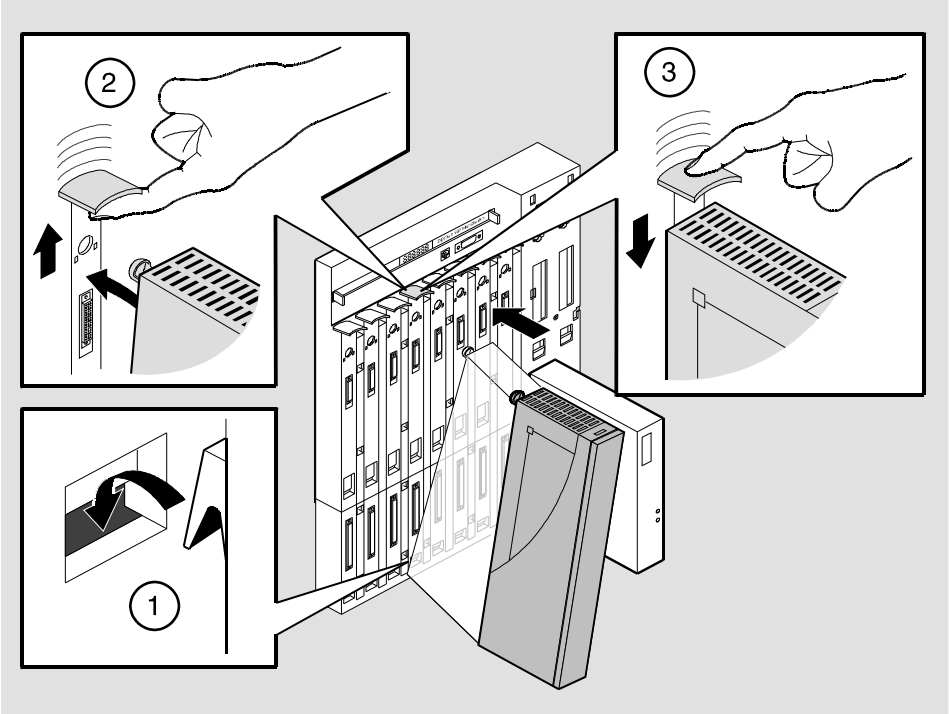
## Task 2: Seat the Module into the DEChub 900

To seat the module, complete the following steps:

| 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, align the connectors and firmly push the module onto the backplane connectors. |
| **4** | Press down on the release lever **(3)** to ensure that it is locked. |

**Figure 2-4: Seating the Module**

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## 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.

| Step | Action |
|---|---|
| **1** | Upon receiving power, verify that the module's Power LED and the Module OK LED, which are OFF initially, light within a few seconds.<br>At this time, the module performs a self-test.<br>Note: The self-test takes 30 to 60 seconds to complete. |
| **2** | After the module completes self-test, the Module OK LED lights. The Hub Manager status display identifies the module as the `RouteAbout Central EI`. |

**NOTE**

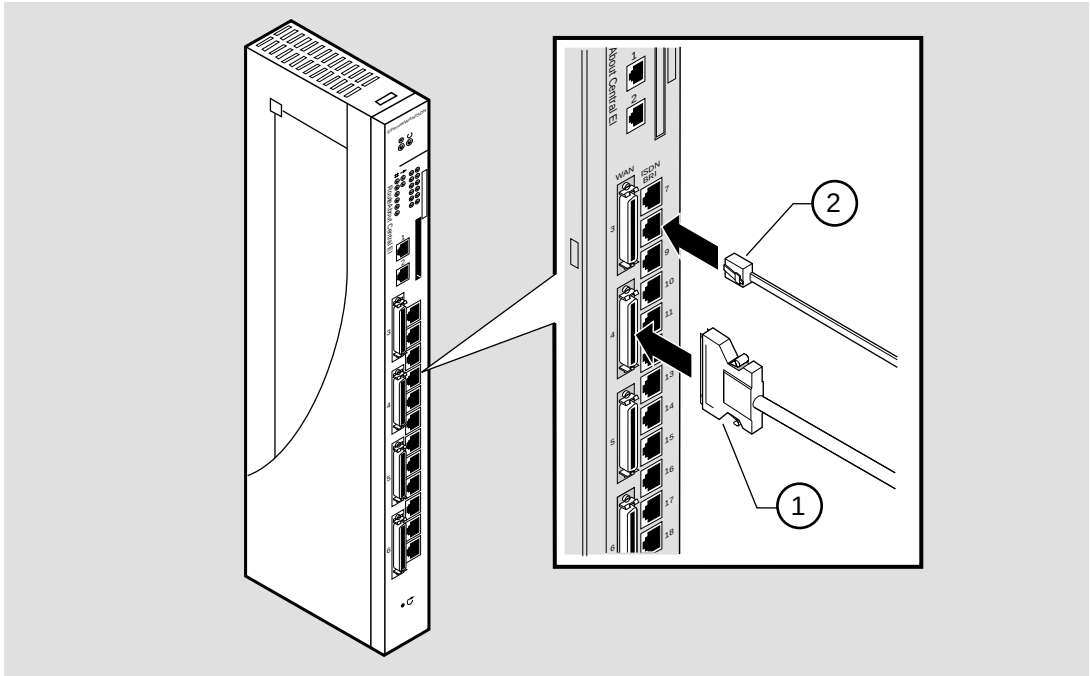
If the LEDs do not operate as described, refer to Appendix A, Problem Solving.

## Task 4: Connect the Cables

To connect the WAN serial cable and the ISDN cable (Figure 2-5), complete the following steps:

| Step | Action |
|---|---|
| **1** | Insert the module's WAN serial cable **(1)** into the connector, ensuring that the release tabs snap into the locked position. See Appendix B for cable information. |
| **2** | Align the release tab on the ISDN cable plug **(2)** with the keyway on the module's ISDN port connector.<br>Note: Depending on your country, an NT1 device may be required. Consult your telephone company for information. |
| **3** | Insert the ISDN line phone cord into the ISDN port, ensuring the release tab snaps into the locked position. |
| **4** | Connect the other end of the cable into the NT1 device. Figure 2-7 illustrates these cable connections. |

**Figure 2-5: Cable Connection**

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## Task 5: Connect the UTP/ScTP Cable

The RouteAbout Central EI uses straight-through, 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:

| If the device you are connecting to the module uses | Then use |
|---|---|
| Crossover connectors[1] | Straight-through cables |
| Straight-through connectors[2] | Crossover cables |

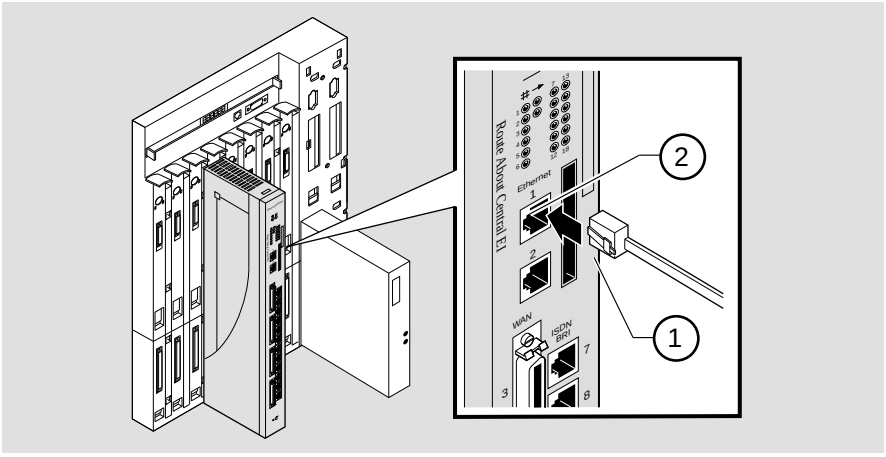
[1]The sum of crossovers must always equal an odd number.

[2]Digital's straight-through cables are marked (=); crossover connectors and cables are marked (x).

To connect the UTP/ScTp cable (Figure 2-6), complete the following steps:

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

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

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# Example Installation Using Open DECconnect Modular Mounting System

## Introduction

Figure 2-7 shows an example installation in which a RouteAbout Central EI is installed in the Open DECconnect Modular Mounting System. This is a space-saving system that attaches to the wall and expands with additional available options. The Open DECconnect Modular Mounting System allows you to build a multi-purpose access system that uses industry standard rack mounting and various DEChub modules.

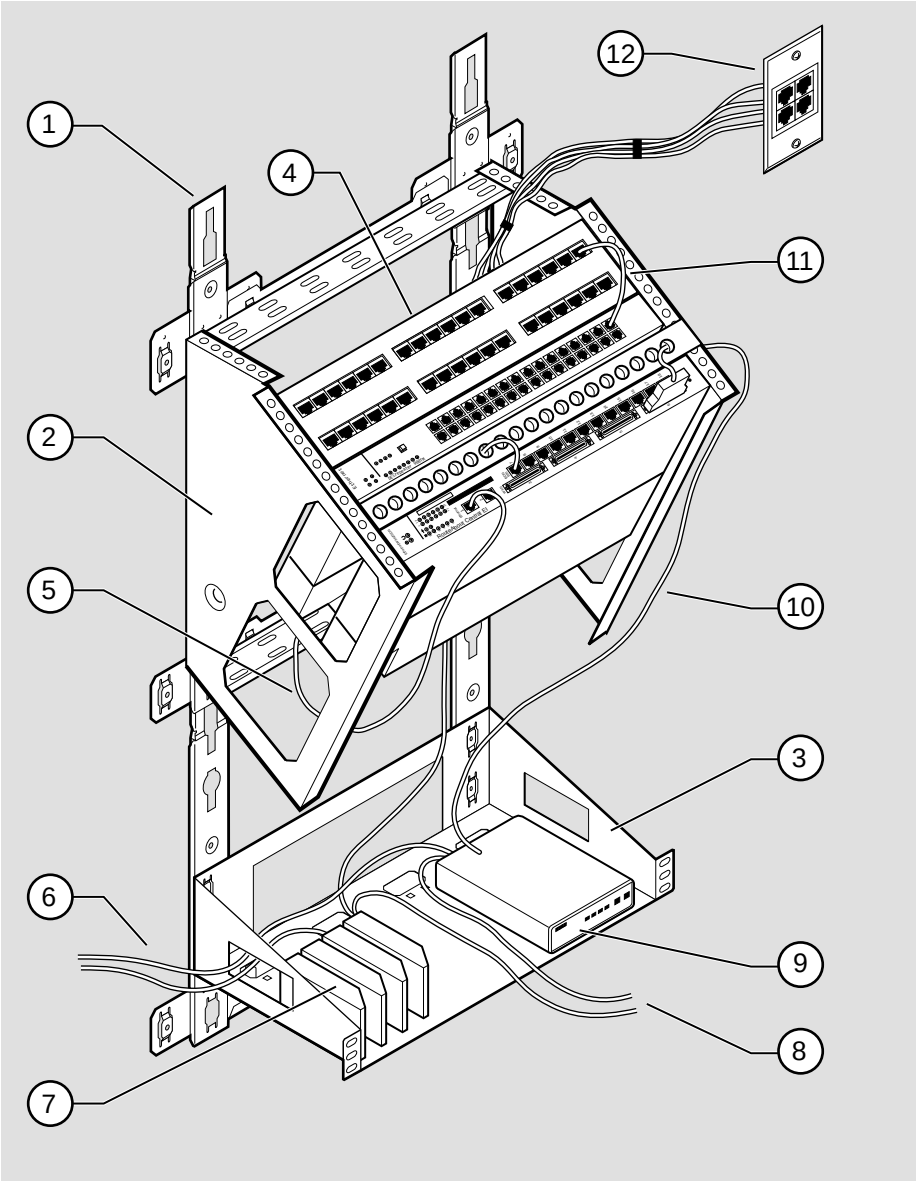
Table 2-3 lists the components of the installation, including the connecting cables.

**Table 2-3: Components of Example Installation**

| Item | Product and Part Number |
|---|---|
| **1** | Open DECconnect Modular Mounting System DERMS-AA |
| **2** | 19-inch RETMA standard angled brackets H3108-RB |
| **3** | Universal Equipment Shelf H3108-TC |
| **4** | Patch Panel H3108-PB, loaded with UTP 8-pin MJ inserts H3117-LA to provide up to 48 ports |
| **5** | Super 5 UTP 8MP-8MP patch cable, BN25G-01. Goes to MAU or to front MJ connector |
| **6** | Connections to Telco lines. |
| **7** | Network Terminators, up to 12 units |
| **8** | Connections to power strip. |
| **9** | Modem or DSU/CSU. |
| **10** | Serial line connection to port 6. See Appendix B, Connectors, Adapters and Cable Connections for list of supported serial cables. |
| **11** | Super 5 UTP 8MP-8MP patch cable, BN25G-0x |
| **12** | H3111-C faceplate |

Example Installation Using Open DECconnect Modular Mounting System

**Figure 2-7: Example RouteAbout Central EI Installation**




NPB-0667-96F

Example Installation Using Open DECconnect Modular Mounting System

## Description

This configuration includes a DECrepeater 900TM twisted-pair repeater module and a patch panel. Installing this configuration requires doing the following tasks:

- Attach the Modular Mounting System (DERMS-AA) to the wall.
- Snap on the rack mount bracket (H3108-RB) and the Universal Equipment Shelf (H3108-TC).
- Mount the patch panel, DECrepeater 900TM, and RouteAbout Central EI using the mounting racks and the hardware shipped with the DEChub ONE docking station.
- Wire up the system using the appropriate cables.
- Select a power strip that can accommodate the total number of power cords used. This configuration, which includes up to 12 Network Terminator units, uses up to 19 power cords.

See these manuals and installation instructions for more information:

| Name | Part Number |
|---|---|
| *Installing the DERMS Modular Mounting System* | EK-DERMS-IN |
| *Installation Instructions for the H310/S-Series Patch Panels and Mounting Components* | EK-H3108IN-IN |
| *DEChub One Installation* | EK-DEHUA-IN |

# Chapter 3

# Installing the Setup Port Cable

## Overview

### Introduction

This chapter describes how to connect the RouteAbout Central EI module to the setup port on a DEChub 900 MultiSwitch or a DEChub ONE docking station.

### In This Chapter

## Signaling Standards

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

## Setup Port Device Cabling

The setup port (see 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:

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

[1] xx indicates cable length in meters.

## Connecting the Setup Port

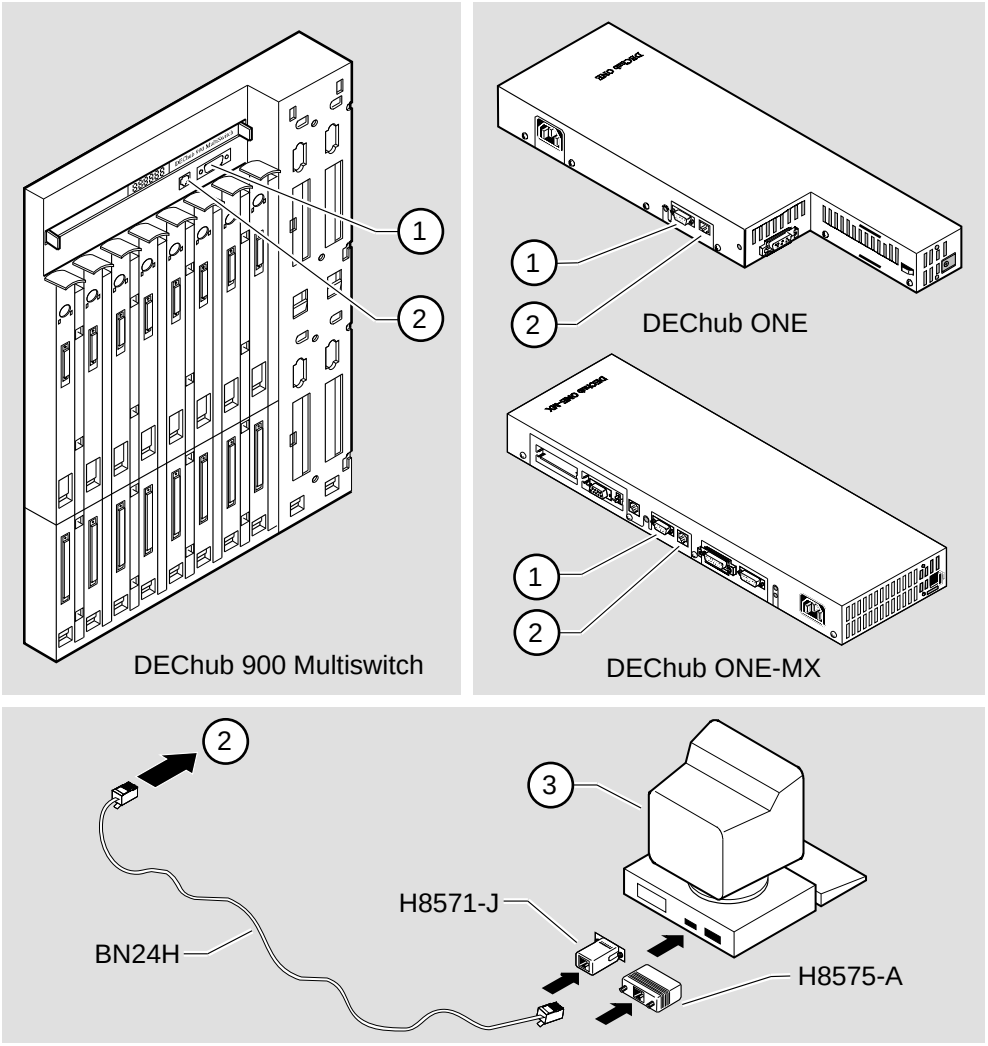
To connect the setup port on the RouteAbout Central EI module, complete the following steps:

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

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

| Item | Description |
|---|---|
| **1)** | OBM Port |
| **2)** | Setup Port |
| **3)** | Setup Port Device |

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




After all cables are connected, go to one of the following sections:

| To | Go to |
|---|---|
| Configure the module in a DEChub ONE | Chapter 4 |
| Configure the module in a DEChub 900 | Chapter 5 |

# Chapter 4

# Configuring the Module in a DEChub ONE

## Overview

### Introduction

This chapter describes how to setup and configure your RouteAbout Central EI when it is installed in a DEChub ONE docking station. For DEChub ONE installation procedures refer to the *DEChub ONE Installation* manual.

### In This Chapter

# Accessing the Setup Port

To configure your module and make it remotely accessible you must assign:

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

The setup port provides menus that allow you to access the RouteAbout Central EI. These menus allow you to setup the module for basic connectivity. After the initial setup, you then configure the module's software using a command-based interface. These commands can be accessed remotely via TCP/IP Telnet, or locally through the setup port on a DEChub ONE docking station.

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

To access the setup menus, press the <Return> key on the setup port device until the `RtAbt Cntrl EI/MP INSTALLATION MENU` appears.

| To configure the module using | Go to the section titled |
|---|---|
| Menus | Using Menus to Setup the Module |
| Commands | Go to Local Console |

## Using Menus to Setup the Module

This section describes the options that are available from the `RtAbt Cntrl EI INSTALLATION MENU` when the module is installed in the DEChub ONE docking station.

The following example shows the menu options available when the module is setup with factory defaults.

```
RtAbt Cntrl EI/MP
============================================================
          RtAbt Cntrl EI/MP  INSTALLATION MENU

          [1]  Restart with Factory Defaults
          [2]  Restart with Current Settings
          [3]  Show Current Settings
          [4]  IP Configuration
          [5]  Out-of-Band Port Configuration
          [6]  Go to Local Console

============================================================
        Enter selection:
```

**NOTE**

The `/MP` that appears in menus will be replaced with `/IP` when using the Internet Protocol package.

If the module was previously configured, the following menu options are available.

```
RtAbt Cntrl EI/MP
=================================================================
        RtAbt Cntrl EI/MP INSTALLATION MENU
    ***************************************************************
     To fully manage this device telnet to one of the
    following IP addresses or select item [3] below.
              Out-of-Band: Not Configured
              In-Band    : 12.34.55.126
    ***************************************************************
           [1] Restart with Factory Defaults
           [2] Restart with Current Settings
           [3] Go to Local Console
     ========================================================
           Enter selection :
```

**NOTE**

The Out-of-Band and In-Band values are listed only if one or more IP parameters have been set.

The following pages describe the installation menu options available on the `RtAbt Cntrl EI Installation Menu:`

| Option | Page |
|---|---|
| [1] Restart with Factory Defaults | 4-5 |
| [2] Restart with Current Settings | 4-7 |
| [3] Show Current Settings | 4-8 |
| [4] IP Configuration | 4-9 |
| [5] Out-of-Band Port Configuration | 4-14 |
| Go to Local Console | 4-17 |

# [1] Restart with Factory Defaults

This option initializes the router's configuration to factory default values by resetting the module's nonvolatile configuration storage parameters and restarting the module. (To retain the current values, use Option `[2] Restart with Current Settings`). 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
RtAbt Cntrl EI/MP
============================================================

                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]:  <Return>
           Press Return for Main Menu...
```

If you selected Y, then the following additional information appears:

```
About to Initialize CONFIG memory
Configuration memory initialized
System Restart ...
```

[1] Restart with Factory Defaults

Then, the EasyStart rebooting feature becomes active. The EasyStart feature allows the module to boot up using existing configuration files. EasyStart messages may appear on the console device. See the *System Software Guide* for more information about the EasyStart feature.

The RteAbout Central EI/MP INSTALLATION MENU menu appears.

# [2] Restart with Current Settings

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

**NOTE**

Allow approximately one minute for the module to restart.

The following example shows the dialog associated with this option.

```
                    Enter selection:  2

RtAbt Cntrl EI/MP
============================================================
               RESTART WITH CURRENT SETTINGS

  This selection will restart your system with the current
   configuration settings.
============================================================
               Press Y to confirm [N] :  <Return>
              Press Return for Main Menu...
```

If you select Y, then the `RtAbt Cntrl EI/MP INSTALLATION MENU` appears.

# [3] Show Current Settings

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

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

```
                  Enter selection : 3
 RtAbt Cntrl EI/MP
 ================================================================
 RtAbt Cntrl EI/MP, Brouter: 2 Enet 4T1 12BRI, HW=1, RO=1, #1489,SW=v2.0.000
 SysUpTime                          : 00:00:52  28 restarts
 SNMP Read/Write Community          : Not Available
 Out-of-Band (OBM) Management RTS   : Disabled
 Default Gateway                    : Not Configured
 ----------------------------------------------------------------
 Interface     IP Address        Subnet Mask     Other Info
 Ethernet      16.126.16.116     255.255.255.0
 Out-of-Band                                     Speed 9600 bps
 ----------------------------------------------------------------
================================================================
           Press Return for Main Menu...
```

# [4] IP Configuration

The IP Configuration option provides you with five selections.

The following example shows the menus available with this option.

```
              Enter selection : 4

RtAbt Cntrl EI/MP
============================================================
                    IP CONFIGURATION
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *  Configuration will not take effect until module     *
 *  is restarted                                        *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

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

             Enter selection:
```

The following pages describe the IP Configuration options.

## [1] Set SNMP Read/Write Community

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

The following example shows the dialog associated with this option.

```
                  Enter selection : 1

 RtAbt Cntrl EI/MP
==================================================================

                  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] : public <Return>

 SNMP Read/Write community string set.

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

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

This option prompts you to change or enter the IP address and subnet mask for the in-band interface. You can only configure one in-band interface at a time. 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, in which each octet of the address is represented as a decimal value, separated by a decimal point (.).

The following example shows the dialog associated with this option.

```
               Enter selection   2
RtAbt Cntrl EI/MP
================================================================

           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     Other Info
 Ethernet
 Out-of-Band
 ----------------------------------------------------------------
================================================================
 Port Number (1-2) [ ] : 2
 IP address [] : 16.126.16.116 <Return>
 Subnet Mask [] : 255.255.0 0 : <Return>
              Press Return for IP Configuration Menu.....
```

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

This option prompts you to change or enter the IP address and subnet mask for the out-of-band interface.

This feature allows you to manage your module through the OBM port on the DEChub ONE docking station 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 `RtAbt Cntrl EI/MP INSTALLATION MENU`.

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 following example shows the dialog associated with this option.

```
               Enter selection   3

RtAbt Cntrl EI/MP
================================================================

           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

   To delete the address, enter 0 in the appropriate
   address field.
----------------------------------------------------------------
 Interface        IP Address     Subnet Mask     Other Info
 Ethernet         16.126.16.116  255.255.255.0
 Out-of-Band                                     Speed 9600 bps
 ----------------------------------------------------------------
================================================================
 IP address [] : 16.126.16.114 <Return>
 Subnet Mask [] : 255.255.0 0 : <Return>
             Press Return for IP Configuration Menu.....
```

## [4] Set Default Gateway

This option sets the default gateway, if necessary for the in-band interface. This is the address of a router that the module will use when communicating to a remote host. The default gateway address must be an address in the same subnet as your in-band address.

The following example shows the dialog associated with this option.

```
              Enter selection : 4
RtAbt Cntrl EI/MP
=========================================================

     SET IN-BAND INTERFACE DEFAULT GATEWAY ADDRESS

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

                 example: 16.20.40.156

 To delete the address, enter 0 in the appropriate
 address field.
=========================================================
  Default Gateway []: 16.126.16.254 <Return>

  Default Gateway Address Set.

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

# [5] Out-of-Band Port Configuration

This option lets you set the out-of-band port speed and enable or disable Request To Send (RTS).

**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 : 5

RtAbt Cntrl EI/MP
============================================================
           OUT-OF-BAND PORT CONFIGURATION

 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *    Configuration will not take effect until module is *
 *    restarted.                                         *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                 [1] Set Port Speed
                 [2] Enable/Disable RTS
                 [3] Return to Main Menu
 ============================================================
                 Enter selection :
```

The following pages describe out-of-band configuration options.

| Option | Page |
|---|---|
| [1] Set Port Speed | 4-15 |
| [2] Enable/Disable RTS | 4-16 |

## [1] Set Port Speed

This option lets you select the out-of-band port speed. The factory default for this option is 9600 baud. The OBM port speed that you select must match the speed of your OBM device.

The following example shows the dialog associated with this option.

```
              Enter selection : 1
RtAbt Cntrl EI/MP
============================================================
            SET OUT-OF-BAND PORT CONFIGURATION

               [1] 2400 baud
               [2] 9600 baud
               [3] 38400 baud
============================================================
    Enter selection [2] (9600): 1 <Return>

          OBM port speed set.

             Press Return for Main Menu . . .
```

## [2] Enable/Disable RTS

This option allows you to enable or disable Request To Send (RTS). The factory default for this option is Disabled.

If the RTS is disabled, the following dialog appears on the screen.

```
                  Enter selection : 2
 RtAbt Cntrl EI/MP
 ================================================================
              ENABLE/DISABLE OUT-OF-BAND PORT RTS

Enable/Disable request to send (RTS) option allows additional
control to modem communications. When the RTS option is disabled
the RTS signal on the OBM port is asserted after self-test is
completed and left asserted. When the RTS option is Enabled the
RTS signal is asserted only when there is data to be transmitted
and deasserted after the data has been transmitted.
================================================================

 RTS is Disabled. Would you like to ENABLE RTS? [N]
```

If RTS is enabled, the screen shows:

```
 RTS is Enabled. Would you like to Disable RTS?
```

# Go to Local Console

This option lets you configure the module.You must configure the module before it is operational. The `Go to Local Console` option provides two different configuration methods, depending on whether the module has been setup with factory defaults or has been previously configured.

If the module has been setup with factory defaults, then this is option `[6] Go to Local Console` from the `RtAbt Cntrl EI/MP INSTALLATION MENU`. This option runs a quick configuration interactive question and answer dialog. This method (qconfig) allows fast configuration of interfaces, basic bridging, and IP and IPX.

If the module has been previously configured, then this is option `[3] Go to Local Console` from the installation menu. This option allows you to configure the module using commands to configure interfaces, bridging, and routing protocols (for example, IPX and IP).

## [6] Go To Local Console (Qconfig)

This selection runs quick configuration. If you reset to factory defaults and select `Go to Local Console` without having configured the router via the installation menu, you automatically enter **qconfig**.

After making the changes you want, you can exit quick configuration and accept the changes you made by typing: **quit**. The system displays the following messages:

```
Quick Config Done
Config (only)>
Type RESTART at Config (only)> prompt for the configuration to
take effect.
```

If you type RESTART at the `Config (only)>` prompt, the following message appears:

```
Are you sure you want to restart the gateway? (Yes [No]):
```

Enter **yes** to proceed.The following menu is then displayed.

```
RtAbt Cntrl EI/MP
============================================================

         RtAbt Cntrl EI/MP INSTALLATION MENU

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*  To fully manage this router Telnet to one of its     *
*  IP addresses or select item [3] below.               *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

          [1] Restart with Factory Defaults
          [2] Restart with Current Settings
          [3] Go to Local Console

============================================================
           Enter selection :
```

## [3] Go To Local Console (Commands)

If you have configured the module, then the following installation menu appears. Select `[3] Go To Local Console` to modify the configuration.

```
RtAbt Cntrl EI/MP
============================================================

         RtAbt Cntrl EI/MP INSTALLATION MENU

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*  To fully manage this router Telnet to one of its     *
*  IP addresses or select item [3] below.               *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

          [1] Restart with Factory Defaults
          [2] Restart with Current Settings
          [3] Go to Local Console

============================================================
       Enter selection number: 3 <Return>
```

The system displays copyright statements and the following prompt:

```
MOS Operator Control
*
```

After the system prompt (*) appears, go to the section CONFIG Commands on page 4-19.

# CONFIG Commands

This section describes commands that are unique to the RouteAbout Central EI. Other CONFIG commands needed to configure the RouteAbout Central EI can be found in the *System Software Guide*. Commands listed in this manual include a command description, syntax requirements, and an example.

**NOTE**

You can configure the module at any time using Quick Configuration, by typing **qconfig** at the `Config>` prompt

To configure the module using commands, perform the following steps:

| Step | Action | |
|---|---|---|
| **1** | At the system prompt (*), enter: **talk 6** | |
| **2** | Select one of the following options. | |
| | **Option** | **Page** |
| | Configuring Ethernet Port Connection | 4-20 |
| | Configuring OBM | 4-21 |

## Configuring Ethernet Port Connection

This section describes how to configure the Ethernet Port by choosing either the front panel 8-pin MJ connector or the DEChub ONE AUI connector.

**Note:** The RouteAbout Central EI enables only Ethernet Port 1 (Net 1) to be directly connected to the AUI connector on the DEChub ONE.

To connect the Ethernet for port 1 to the front panel 8-pin MJ connector, perform the following steps:

| Step | Action |
|---|---|
| **1** | At the `Config>` prompt enter: **net 1** |
| **2** | At the `ETH config>` prompt enter: **connector-type RJ45** |

To connect the Ethernet for port 1 to the AUI connector on the DEChub ONE, perform the following steps:

| Step | Action |
|---|---|
| **1** | At the `Config>` prompt enter: **net q** |
| **2** | At the `ETH config>` prompt enter: **connector-type AUI** |

### To Exit and Restart

When you modify parameters, you must restart the router for the change to take effect. Enter the following three commands in the order shown.

| Command | Type at the |
|---|---|
| **exit** | ETH Config prompt (ETH `Config>`) |
| **control/p** | CONFIG prompt (`Config>`) |
| **restart** | System prompt (*) |

If you need to configure additional software, refer to the *System Software Guide.*

## Configuring OBM

This section describes how to set the OBM IP address, speed, and enable RTS. After entering **talk 6**, at the `Config>` prompt you can set the following three OBM parameters as follows:

| Parameter | Description | Default |
|---|---|---|
| **set obm ip 16.40.156.20** | Sets the out-of-band management port IP-address (for example, 16.40.156.20). | current IP-address |
| **set obm speed 38400** | Sets the OBM port speed (2400, 9600, or 38400 bps). | 9600 |
| **set obm rts enable** | Sets data transmission Request to Send (RTS) to Enable or Disable. | Disable |

### To Exit and Restart

When you modify parameters, you must restart the router for the change to take effect. Enter the following commands.

| Command | Type at the |
|---|---|
| **control/p** | CONFIG prompt (`Config>`) |
| **restart** | System prompt (*) |

If you need to configure additional software, refer to the *System Software Guide.*

# Chapter 5

# Configuring the Module in a DEChub 900

## Overview

### Introduction

This chapter describes how to configure your RouteAbout Central EI when it resides in a DEChub 900 MultiSwitch.

### In This Chapter

# DEChub 900 MultiSwitch Installation Menu

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

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

```
DEChub 900 MultiSwitch
============================================================

       DEChub 900 MultiSwitch INSTALLATION MENU

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

    Enter selection number: 9 <Return>
  Press Return for Main Menu ...
```

# [9] Start Redirect Mode

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

After you choose the `Start Redirect Mode` option, the screen display prompts you for a slot number (8) as shown in the following example. After you enter the number of the slot in which the RouteAbout Central EI is installed, the console is redirected to this slot.

**NOTE**

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

The following example shows the dialog associated with this option.

```
Enter selection: 9
=====================================================
Enter the slot number for redirection (1-8):  8 <Return>
Console redirected to 3: RtAbt Cntrl EI/MP
Attempting connection
[Ctrl/C] Return to Hub Manager Installation Menu...
```

If the redirection is successful after you press the <Return> key, the `RtAbt Cntrl EI/MP INSTALLATION MENU` appears on your screen. Go to Using Menus to Setup the Module on page 5-4.

# Using Menus to Setup the Module

This section describes the options that are available from the `RtAbt Cntrl EI/MP INSTALLATION MENU` when the module is installed in the DEChub 900 MultiSwitch.

The following example shows the menu options available when the module is setup with factory defaults.

```
RtAbt Cntrl EI/MP - slot 8
============================================================
          RtAbt Cntrl EI/MP  INSTALLATION MENU

          [1]  Restart with Factory Defaults
          [2]  Restart with Current Settings
          [3]  Show Current Settings
          [4]  IP Configuration
          [5]  Go to Local Console


[Ctrl/C' Return to Hub Manager Installation Menu
============================================================
           Enter selection: <Return>
    Press Return for Main Menu . . .
```

**NOTE**

The `/MP` that appears in menus will be replaced with `/IP` when using the Internet Protocol package.

If the module was previously configured, the following menu options are available.

```
RtAbt Cntrl EI/MP - slot 8
================================================================
               RtAbt Cntrl EI/MP INSTALLATION MENU

         ************************************************
           To fully manage this device telnet to one of the
           following IP addresses or select item [3] below.
           Out-of-Band: Not Configured
           In-Band    : 12.34.55.126
         ************************************************

                   [1] Restart with Factory Defaults
                   [2] Restart with Current Settings
                   [3] Go to Local Console

============================================================
                       Enter selection :
```

**NOTE**

The Out-of-Band and In-Band values are listed only if one or more IP parameters have been set.

The following table describes the installation menu options.

# [1] Restart with Factory Defaults

This option restarts the module, causing the module's configured nonvolatile configuration storage parameters to be initialized to factory default values. (To retain current values, use option `[2] Restart with Current Settings`). 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
RtAbt Cntrl EI/MP - slot 8
============================================================

                RESET 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]:  <Return>
     Press Return for Main Menu...
```

If you selected Y, then the following messages appear:

```
  Module Not Responding! Connection Closed!
  Press Return for Main Menu...
```

The `DEChub 900 MultiSwitch INSTALLATION MENU` appears. Redirect to the module in order to resume communication.

The RteAbout Central EI`/MP INSTALLATION MENU` appears.

# [2] Restart with Current Settings

This option restarts 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

RtAbt Cntrl EI/MP - slot 8
============================================================

            RESTART WITH CURRENT SETTINGS

  This selection will reset your system with the current
    configuration settings.
============================================================
Press Y to confirm [N] :  Y <Return>
Module Not Responding! Connnection Closed!

Press Return for Main Menu...
```

The `DEChub 900 MultiSwitch INSTALLATION MENU` appears. Redirect to the module in order to resume communicatin.

# [3] Show Current Settings

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

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

```
 Enter selection : 3

  RtAbt Cntrl EI/MP - slot 8
 ============================================================
 RtAbt Cntrl EI/MP, Brouter: 2 Enet 8T1, HW=1,#1489,SW=v2.0.000
 SysUpTime                          : 00:00:52  28 restarts
 SNMP Read/Write Community          : smith95
 Out-of-Band (OBM) Management RTS   : Disabled
 Default Gateway                    : 16.126.16.254
 ------------------------------------------------------------
 Interface     IP Address        Subnet Mask     Other Info

 Ethernet      16.126.16.116     255.255.255.0

 Out-of-Band
 ------------------------------------------------------------
 ============================================================

            Press Return for Main Menu...
```

# [4] IP Configuration

The IP Configuration option provides you with five selections.

The following example shows the dialog associated with this option.

```
            Enter selection : 4

RtAbt Cntrl EI/MP - slot 8
============================================================
                    IP CONFIGURATION
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *  Configuration will not take effect until module    *
 *  is restarted                                       *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

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

             Enter selection:
```

The following pages describe IP Configuration options.

## [1] Set SNMP Read/Write Community

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

The following example shows the dialog associated with this option.

```
                    Enter selection : 1


 RtAbt Cntrl EI/MP - slot 8
================================================================

                  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 <Return>

 SNMP Read/Write community string set.

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

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

This option prompts you to change or enter the IP address and subnet mask for the in-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, in which each octet of the address is represented as a decimal value, separated by a decimal point (.).

The following example shows the dialog associated with this option.

```
               Enter selection   2

RtAbt Cntrl EI/MP - slot 8
================================================================

           IN-BAND INTERFACE IP ADDRESS CONFIGURATION

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

                   example: 16.20.40.156

   To delete the IP address, enter 0 in the appropriate
   address field.
----------------------------------------------------------------
 Interface        IP Address     Subnet Mask     Other Info
 Ethernet
 Out-of-Band
 ----------------------------------------------------------------
================================================================
 Port Number (1-2) [ ] : 2
 IP address [] : 16.126.16.116 <Return>
 Subnet Mask [255.0.0.0] : 255.255.0 0 : <Return>
 Press Return for IP Configuration Menu.....
```

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

This option prompts you to change or enter the IP address and subnet mask for the out-of-band 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, in which each octet of the address is represented as a decimal value, separated by a decimal point (.).

The following example shows the dialog associated with this option.

```
                Enter selection   3

RtAbt Cntrl EI/MP - slot 8
================================================================

           OUT-OF-BAND INTERFACE IP ADDRESS CONFIGURATION

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

                    example: 16.20.40.156

   To delete the address, enter 0 in the appropriate
   address field.
----------------------------------------------------------------
 Interface        IP Address     Subnet Mask     Other Info
 Ethernet         16.126.16.116  255.255.255.0
 Out-of-Band
 ---------------------------------------------------------------
================================================================

 IP address [] : 16.126.16.114 <Return>
 Subnet Mask [255.0.0.0] : 255.255.0 0 : <Return>

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

## [4] Set Default Gateway

This option sets the default gateway, if necessary, for the in-band interface. This is the address of a router that the module uses when communicating to a remote host. The default gateway address must be in the same subnet as your in-band address.

The following example shows the dialog associated with this option.

```
          Enter selection : 4
RtAbt Cntrl EI/MP - slot 8
============================================================

     SET IN-BAND INTERFACE DEFAULT GATEWAY ADDRESS

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

                 example: 16.20.40.156

 To delete the address, enter 0 in the appropriate
 address field.
============================================================
  Default Gateway []: 16.126.16.254 <Return>

  Default Gateway Address Set.

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

If you need to configure additional software, refer to the *System Software Guide*.

# Go to Local Console

This option lets you configure the module.You must configure the module before it is operational. The `Go to Local Console` option provides two different configuration methods, depending on whether the module has been setup with factory defaults or has been previously configured.

If the module has been setup with factory defaults, then this is option `[5] Go to Local Console` from the `RtAbt Cntrl EI/MP INSTALLATION MENU`. This option runs a quick configuration interactive question and answer dialog. This method (qconfig) allows fast configuration of interfaces, basic bridging, and IP and IPX.

If the module has been previously configured, then this is option `[3] Go to Local Console` from the installation menu. This option allows you to configure the module using commands to configure interfaces, bridging, and routing protocols (for example, IPX and IP).

**NOTE**

You must restart the module in order for the configuration changes to take effect. The hub will close the connection to the selected slot after restart, but you can resume communication with the desired slot after redirection.

## [5] Go To Local Console (Qconfig)

This selection runs quick configuration. If you reset to factory defaults and select `Go to Local Console` without having configured the router via the installation menu, you automatically enter **qconfig**.

After making the changes you want, you can exit quick configuration and accept the changes you made by typing: **quit**. The system displays the following messages:

```
Quick Config Done
Config (only)>
Type RESTART at Config (only)> prompt for the configuration to
take effect.
```

If you type RESTART at the `Config (only)>` prompt, the following message appears:

```
Are you sure you want to restart the gateway? (Yes [No]):
```

Enter **yes** to proceed.The following menu is then displayed.

```
RtAbt Cntrl EI/MP - slot 8
============================================================

         RtAbt Cntrl EI/MP INSTALLATION MENU

 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *  To fully manage this router Telnet to one of its     *
 *  IP addresses or select item [3] below.               *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

          [1] Restart with Factory Defaults
          [2] Restart with Current Settings
          [3] Go to Local Console
          [Ctrl/C] Return to the Hub Manager Installation Menu
============================================================
           Enter selection :
```

## [3] Go To Local Console (Commands)

If you have configured the module, then the following installation menu appears. Select `[3] Go To Local Console` to modify the configuration.

```
RtAbt Cntrl EI/MP - slot 8
============================================================

         RtAbt Cntrl EI/MP INSTALLATION MENU

 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *  To fully manage this router Telnet to one of its     *
 *  IP addresses or select item [3] below.               *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

          [1] Restart with Factory Defaults
          [2] Restart with Current Settings
          [3] Go to Local Console

============================================================
       Enter selection number: 3 <Return>
```

Go to Local Console

The system displays copyright statements and the following prompt:

```
MOS Operator Control
*
```

After the system prompt (*) appears, go to the section CONFIG Commands on page 5-17.

# CONFIG Commands

This section describes commands that are unique to the RouteAbout Central EI. Other CONFIG commands needed to configure the RouteAbout Central EI can be found in the *System Software Guide*. Commands listed in this manual include a command description, syntax requirements, and an example.

**NOTE**

You can configure the module at any time using Quick Configuration, by typing **qconfig** at the `Config>` prompt

To configure the module using commands, perform the following steps:

| Step | Action | |
|---|---|---|
| **1** | At the system prompt (*), enter: **talk 6** | |
| **2** | Select one of the following options. | |
| | **Option** | **Page** |
| | Configuring Ethernet Port Connection | 5-18 |
| | Configuring OBM | 5-19 |

## Configuring Ethernet Port Connection

This section describes how to configure the Ethernet Port by choosing either the front panel 8-pin MJ connector or the DEChub ONE AUI connector.

**Note:** The RouteAbout Central EI enables only Ethernet Port 1 (Net 1) to be directly connected to the AUI connector on the DEChub ONE.

To connect the Ethernet for port 1 to the front panel 8-pin MJ connector, perform the following steps:

| Step | Action |
|---|---|
| **1** | At the `Config>` prompt enter: **net 1** |
| **2** | At the `ETH config>` prompt enter: **connector-type RJ45** |

To connect the Ethernet for port 1 to the AUI connector on the DEChub ONE, perform the following steps:

| Step | Action |
|---|---|
| **1** | At the `Config>` prompt enter: **net q** |
| **2** | At the `ETH config>` prompt enter: **connector-type AUI** |

### To Exit and Restart

When you modify parameters, you must restart the router for the change to take effect. Enter the following three commands in the order shown.

| Command | Type at the |
|---|---|
| **exit** | ETH Config prompt (ETH `Config>`) |
| **control/p** | CONFIG prompt (`Config>`) |
| **restart** | System prompt (*) |

If you need to configure additional software, refer to the *System Software Guide.*

## Configuring OBM

This section describes how to set the OBM IP address, speed, and enable RTS. After entering **talk 6**, at the `Config>` prompt you can set the following three OBM parameters as follows:

| Parameter | Description | Default |
|---|---|---|
| **set obm ip 16.40.156.20** | Sets the out-of-band management port IP-address (for example, 16.40.156.20). | current IP-address |
| **set obm speed 38400** | Sets the OBM port speed (2400, 9600, or 38400 bps). | 9600 |
| **set obm rts enable** | Sets data transmission Request to Send (RTS) to Enable or Disable. | Disable |

### To Exit and Restart

When you modify parameters, you must restart the router for the change to take effect. Enter the following commands.

| Command | Type at the |
|---|---|
| **control/p** | CONFIG prompt (`Config>`) |
| **restart** | System prompt (*) |

If you need to configure additional software, refer to the *System Software Guide.*

# Chapter 6

# Supporting ISDN

## Overview

### Introduction

Before you begin to configure your RouteAbout Central EI, you must make sure you have completed the necessary steps in obtaining ISDN support.

This chapter defines what you will need to do to obtain the proper ISDN support.

### In This Chapter

# Ordering Your ISDN Line

You should order your ISDN service from your local telephone company. The telephone company may provide you with a switch type. The ISDN interface can be connected to the following types of switches: NET3, INS64, VN3, 5ESS, DMS100, AUSTEL, or NI1.

You will need to specify your grade of service and you will need to have at least circuit-switched data service on the B1 channel.

If a fixed TEI (Terminal Endpoint Interface) is required by the TELCO switch, your PTT/telephone company will provide you with this value. The RouteAbout Central EI default capability supports Automatic TEI assignment. This can be changed if fixed values are required.

If you are within North America, you will need to supply the telephone company with the following information:

- Local area code and phone number to verify availability of service.
- Grade of service required.

The telephone company will provide the following information:

- Primary Directory Number (PDN). A telephone number assigned to each ISDN line.
- Directory Number (DN), which is the address or telephone number for the ISDN line assigned by the telephone company. The telephone company will provide more directory numbers, if necessary.
- Service Profile Identifier (SPID). A number assigned to each device connected to the ISDN line (Optional).
- Type of Switch.

It is recommended that you write this information down so it will be available when you configure the RouteAbout Central EI.

If you are outside North America, use the information you receive from your local PTT to configure the module.

# Obtaining a Network Termination Device

In the United States the telephone company provides you with a U-interface connection. Because of this, you need a network termination device (NT1) to convert the U-interface to the S/T-interface. In Europe and other parts of the world, an NT1 is not required as an S/T-interface is provided.

The network termination device (NT1) looks like a modem. The device provides network termination functions to your basic rate interface (BRI) connection. The NT1 device allows you to add S/T-interface devices to your ISDN connection.

Depending on your country, you may need an NT1 device to connect the RouteAbout Central EI to your ISDN line. Check with your local telephone company or your authorized Digital reseller to see if they can provide one for you.

Make sure the NT1 device you choose has the following items necessary to connect the module to the ISDN line:

- Power supply, either integrated or separate.
- Cable to attach the NT1 device.

# Chapter 7

# Configuring the ISDN Port

## Overview

### Introduction

After you have installed the RouteAbout Central EI, you will need to configure the ISDN port. The ISDN port allows you to pass data in and out of the RouteAbout Central EI.

The instructions provided in this chapter describe how to setup and configure the ISDN port. For more detailed information about the ISDN configuration commands, see the *Network Interface Operator's Guide*.

### In This Chapter

# Configuring the ISDN Port

This section describes the commands that are unique to the RouteAbout Central EI. To begin configuring the ISDN port, at the * prompt enter the following command:

```
* talk 6
```

The actual ISDN ports are net 6 through net 17. The following shows their correlation:

| net | ISDN Interface |
|---|---|
| 6 | ISDN/0 (closest to the LEDs) |
| 7 | ISDN/1 |
| 8 | ISDN/2 |
| 9 | ISDN/3 |
| 10 | ISDN/4 |
| 11 | ISDN/5 |
| 12 | ISDN/6 |
| 13 | ISDN/7 |
| 14 | ISDN/8 |
| 15 | ISDN/9 |
| 16 | ISDN/10 |
| 17 | ISDN/11 (closest to the Dump button) |

## To Exit and Restart

When you modify parameters, you must restart the module for the change to take effect. Enter the following three commands in the order shown:

| Type at this prompt | Command |
|---|---|
| Circuit Config> | **exit** |
| Config> | **control/p** |
| * | **restart** and answer "**Yes**" at the prompt |

## Adding ISDN Addresses

You need to add an ISDN address for each ISDN interface, as well as for each destination. The ISDN address includes:

- *Address name*. Description of the address. You can use any string of up to 23 printable ASCII characters. Address names are case sensitive.
- *Network dial address*. Telephone numbers of the local or destination port. You can enter up to 15 numbers as well as 16 other characters, including spaces and punctuation. The router uses only the numbers.
- *Network subdial address*. Optional. Additional part of the telephone number, such as an extension, that is passed through the telephone network and interpreted by the customer equipment. Not all telephone companies support subaddressing. You can enter up to 20 numbers as well as 11 additional spaces and punctuations. The router uses only the numbers.

# Configuring ISDN Parameters

The following sections describe how to add information that is obtained from the telephone company to your ISDN configuration.

## Setting the Local Number

To add your local ISDN information, perform the following steps when prompted:

| Step | Action |
|---|---|
| 1 | `Config>` **add isdn-address** |
| 2 | `Assign address name [1-23] chars []?` **myaddress** |
| 3 | `Assign network dial address [1-15 digits] []?` **1-222-555-1000**<br>Note: The number provided here is an example. You must enter your assigned ISDN number here. In the United States, 1+ area code may not be allowed when calling within the area code. |
| 4 | `Assign subdial address [0-15 digits] []` <**Return**> |

## Setting the Remote Dial Number

To add your remote ISDN information, perform the following steps when prompted:

| Step | Action |
|---|---|
| 1 | `Config>` **add isdn-address** |
| 2 | `Assign address name [1-23] chars []?` **remoteaddress** |
| 3 | `Assign network dial address [1-15 digits] []?` **1-222-555-2000**<br>Note: The number provided here is an example. You must enter your assigned ISDN number here. In the United States, 1+ area code may not be allowed when calling within the area code.<br>This is the number that will be sent to the switch when making a call. You must add required access codes, for example, some PBX's require a leading **9** to access an outside line. |
| 4 | `Assign subdial address [0-15 digits] []?` **999**<br>Note: The subdial address is optional. It can be selected by the user, if needed. |

## Creating the PPP Circuit

To add the names and telephone numbers of remote sites you will be communicating with, perform the following step for each site when prompted:

| Step | Action |
|---|---|
| **1** | `Config>` **add device dial**<br>The following message appears:<br>`Adding device as interface 18`<br>`Defaulting Data-link protocol to PPP`<br>`Use "net 18" command to configure circuit parameters`<br>Note: If more than one dial circuit is added, a number other than 18 will appear. |

## Configuring the ISDN Net

These steps allow you to select the switch type that your service provider uses, as well as additional characteristics. The switch type should have been identified by your service provider.

**NOTE**

The RouteAbout Central EI supports only one switch variant at a time for all ISDN ports. For example, if the AT&T 5ESS Switch-Variant-Model is selected, then this switch type is established for all ports.

The Switch-Variant-Model must be set on ISDN interface 0 (net 6). Once set, this interface will determine the switch variant for all of the ISDN interfaces. Attempts to set interfaces 1 - 11 (nets 7 -17) to a different switch type will result in warning messages issued by the software.

## Configuring ISDN Parameters

To configure your ISDN net, perform the following steps when prompted:

| Step | Action |
|---|---|
| **1** | `Config>` **net 6**<br>The `ISDN Config>` prompt appears.<br>At any time you can view a list of current parameters by entering **list** at the `ISDN Config>` prompt. |
| **2** | `ISDN Config>` **list**<br>A list of current configurations appear. |
| **3** | `Config>` **set switch-variant**<br>This sets the type of switch to which the ISDN interface is connected. The options are NET3, INS64, VN3, 5ESS, DMS100, AUSTEL, and NI1.<br>Note: You can list parameters at any time to confirm your changes. |
| **4** | `Switch-Variant-Model []?` **net3**<br>If you set the switch-variant to NET3 or VN3, set the directory number of the local port. Use the **set dn0** (directory number 0) command. Enter the network dial address (telephone number) of the ISDN address that you entered using **dn0 myaddress**. |
| **5** | `ISDN Config>` **set local myaddress**<br>This sets the local network ISDN address with the name you assigned earlier for your number. |
| **6** | `ISDN Config>` **set dn0 myaddress**<br>This sets your dial number. This setting is not required for all switch types. Use your ISDN dial number. |
| **7** | `ISDN Config>` **list**<br>A list of current configurations appears. |
| **8** | `ISDN Config>` **exit**<br>You are returned to the `Config>` prompt. |

## Assigning ISDN to your PPP Dial Circuit

To assign ISDN to the PPP dial circuit, perform the following steps when prompted:

| Step | Action |
|---|---|
| 1 | `Config>` **net 18**<br>The module responds with `Circuit Configuration`.<br>The `Circuit Config>` prompt appears.<br>At any time you can view a list of current parameters by entering **list** at the `ISDN Config>` prompt. |
| 2 | `Circuit Config>` **set net** |
| 3 | `Base net for this circuit []?` **6 thru 17** |
| 4 | `Circuit Config>` **set destination**<br>This selects the number that the module will call. |
| 5 | `Assign destination address name []?` **remoteaddress**<br>You are returned to the `Config>` prompt. |
| 6 | `Circuit Config>` **list**<br>This confirms settings. |

## Accepting Calls

To set the module to accept calls from any number, perform these steps:

| Step | Action |
|---|---|
| 1 | `Config>` **net 18**<br>The module responds with `Circuit Configuration`.<br>The `Circuit Config>` prompt appears.<br>At any time you can view a list of current parameters by entering **list** at the `ISDN Config>` prompt. |
| 2 | `Circuit Config>` **set any**<br>This sets the device to accept calls from any number.<br>Note: Use the **set any** command with caution. See the *Network Interface User's Guide* for more information. |
| 3 | `Circuit Config>` **list**<br>This confirms the listing of settings. |

## Set Calls INBOUND/OUTBOUND/BOTH

You have the option to restrict the circuit to be used for inbound calls only, outbound calls only, or both (the default). To set the type of calls that will be accepted, perform the following steps when prompted:

| Step | Action |
|---|---|
| 1 | `Config>` **net 18**<br>The module responds with `Circuit Configuration`.<br>The `Circuit Config>` prompt appears. |
| 2 | `Circuit Config>` **set calls *options***<br>The *options* are INBOUND, OUTBOUND, or BOTH. |
| 3 | `Circuit Config>` **list**<br>This confirms the listing of settings. |

## Set INBOUND Destination

If you wish to set the inbound destination, perform the following steps when prompted:

| Step | Action |
|---|---|
| 1 | `Config>` **net 18**<br>The module responds with `Circuit Configuration`.<br>The `Circuit Config>` prompt appears. |
| 2 | `Circuit Config>` **set inbound remoteaddress**<br>On an incoming call, the caller's phone number will be matched against this address assigned to this circuit. The **remoteaddress** that was previously assigned is the destination. |
| 3 | `Circuit Config>` **list**<br>This confirms the listing of settings. |

## Verifying Configuration

You can list the current configuration by performing the following steps when prompted:

| Step | Action |
|---|---|
| 1 | `Config>` **net 6** |
| 2 | `ISDN Config>` **list**<br>A list of current configurations appear. |

After you exit and restart the module so that the changes can take effect, you can view your configuration from the GWCON (+) prompt by performing the following steps:

| Step | Action |
|---|---|
| 1 | At the system prompt (*) enter: **talk 5**<br>The following message appears:<br>`CGW Operator Console` |
| 2 | At the GWCON prompt (+) enter: **config**<br>A display of the configured interfaces and the state of the interfaces appears. |

The following example shows the dialog associated with this option:

```
RtAbt Cntrl EI/IP, Central: 2 Enet 12BRI,HW=1,RO=1,#212,SW=X01.5.001
Hostname: [not configured]
Boot ROM version  3.0      Watchdog timer enabled     Auto-boot switch
enabled

Num Name  Protocol
0   IP    DOD-IP
3   ARP   Address Resolution
11  SNMP  Simple Network Management Protocol

Num Name  Feature
2   MCF   MAC Filtering

20 Networks:
Net Interface  MAC/Data-Link         Hardware                      State
0   Eth/0      Ethernet/IEEE 802.3   SCC Ethernet                  Up
1   Eth/1      Ethernet/IEEE 802.3   SCC Ethernet                  Up
2   PPP/0      Point to Point        SCC Serial Line               Down
3   PPP/1      Point to Point        SCC Serial Line               Down
4   PPP/2      Point to Point        SCC Serial Line               Down
5   PPP/3      Point to Point        SCC Serial Line               Down
6   ISDN/0     ISDN Base Net         ISDN Basic Rate               Down
7   ISDN/1     ISDN Base Net         ISDN Basic Rate               Up
8   ISDN/2     ISDN Base Net         ISDN Basic Rate            Disabled
9   ISDN/3      ISDN Base Net         ISDN Basic Rate            Disabled
10  ISDN/4     ISDN Base Net         ISDN Basic Rate            Disabled
11  ISDN/5     ISDN Base Net         ISDN Basic Rate            Disabled
12  ISDN/6     ISDN Base Net         ISDN Basic Rate               Up
13  ISDN/7     ISDN Base Net         ISDN Basic Rate               Up
14  ISDN/8     ISDN Base Net         ISDN Basic Rate            Disabled
15  ISDN/9     ISDN Base Net         ISDN Basic Rate           Disabled
16  ISDN/10    ISDN Base Net          ISDN Basic Rate             Disabled
17  ISDN/11    ISDN Base Net          ISDN Basic Rate             Disabled
18  PPP/4      Point to Point        ISDN Basic Rate              Down
19  PPP/5      Point to Point        ISDN Basic Rate               Up
+
[EOB]
```

# Chapter 8

# Removing the Module

## Overview

### Introduction

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

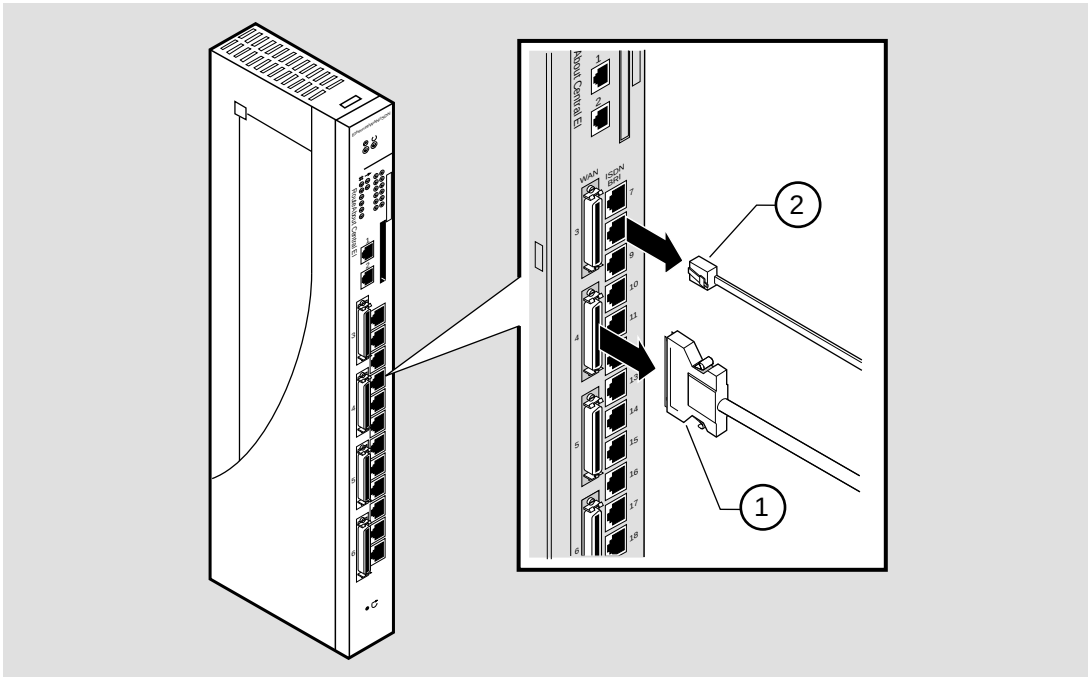
### In This Chapter

# Removing the Cables

To remove cables from the module, complete the following steps (see Figure 8-1).

| Step | Action |
|---|---|
| **1** | Press the release tab **(1)** on the ISDN cable plug**,** then pull out the cable. |
| **2** | Push in the release tabs **(2)** on the side of the WAN serial cable connector, then pull out the cable. |

**Figure 8-1: Removing the Cables**



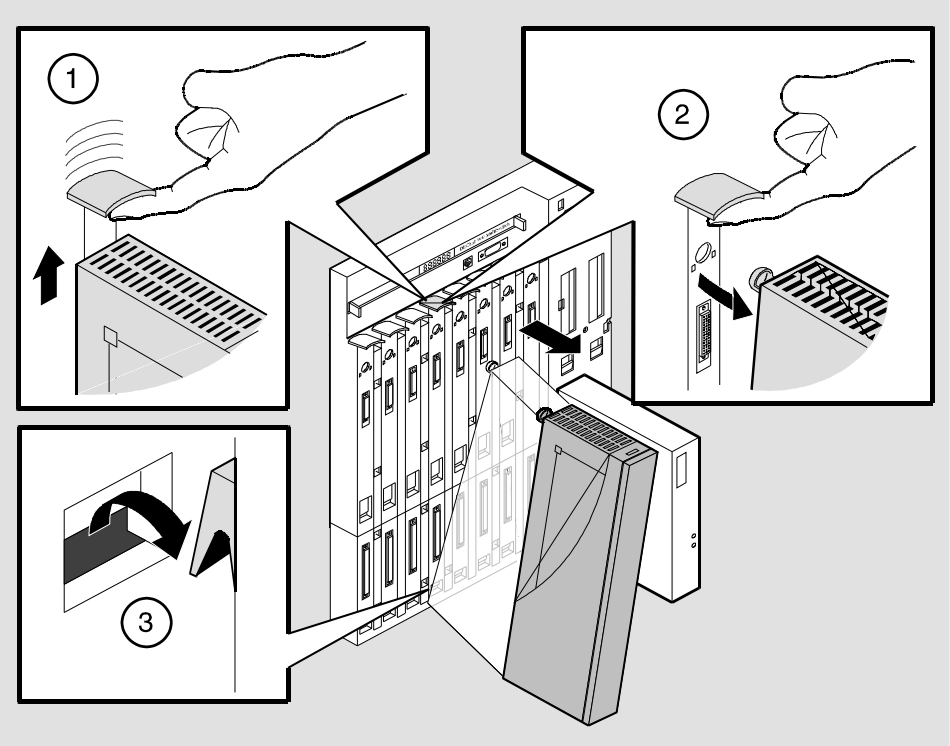

NPB-0480-96F

## Unseating the Module

To unseat the module from the DEChub 900 MultiSwitch, complete the following steps (refer to Figure 8-2).

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

**Figure 8-2: Unseating the Module**




NPG-0008-95F

# Appendix A

# Problem Solving

## Overview

### Introduction

This appendix describes the LED functions and provides problem solving information. The LEDs on the front of the module, with this appendix, provide information to help you correct possible problems.

### In This Appendix

## Normal Powerup

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

| Event | Description |
|---|---|
| 1 |  The module's Power LED lights as soon as power is applied to the unit. |
| 2 | The module initiates its built-in self-test. Flashing port serial line LEDs and activity LEDs indicate that the module is running various subroutines as part of the self-test. See Table A-1. |
| 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 the Table A-2. |

## Self-Test Progress States

Upon power up, the module immediately begins a sequence of self tests and memory sizing. The following sequence of LEDs pass by so quickly that it is difficult to identify the discrete steps on a functioning module.

Should a hardware fault be detected, the LEDs will reflect the progress made into the self–test. This information can be useful when describing problems to your service representative.

**NOTE**

These tests are run prior to the Module OK LED being lit.

Table A-1 describes the module's self–test progress LED states.

**Table A-1: Module Self Test Progress LED States**

| | | 1 | 2 | 3 | 4 | 5 | 6 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Microprocessor test and register setup |
| 1 | 0 | G | 0 | 0 | 0 | 0 | 1 | Microprocessor interrupts set up |
| 1 | 0 | G | 0 | 0 | 0 | 1 | 0 | Option card microprocessor set up |
| 1 | 0 | G | 0 | 0 | 0 | 1 | 1 | Option card interrupts set up |
| 1 | 0 | G | 0 | 0 | 1 | 0 | 0 | Memory controller port and memory set up |
| 1 | 0 | G | 0 | 0 | 1 | 0 | 1 | Peripheral controller port set up |
| 1 | 0 | G | 0 | 0 | 1 | 1 | 0 | Option card port set up (if present) |
| 1 | 0 | G | 0 | 0 | 1 | 1 | 1 | Restart configuration set up |
| 1 | 0 | G | 0 | 1 | 0 | 0 | 0 | Memory controller dpram test |
| 1 | 0 | G | 0 | 1 | 0 | 0 | 1 | Peripheral controller dpram test |
| 1 | 0 | G | 0 | 1 | 0 | 1 | 0 | Option card dpram set up (if present) |
| 1 | 0 | G | 0 | 1 | 0 | 1 | 1 | DEChub serial channel internal loopback test |
| 1 | 0 | G | 0 | 1 | 1 | 0 | 0 | Debug console internal loopback test |
| 1 | 0 | 0 | G | 0 | 0 | 0 | 1 | Memory test set up |
| 1 | 0 | 0 | G | 0 | 0 | 1 | 0 | Bank 0 simm presence test |
| 1 | 0 | 0 | G | 0 | 0 | 1 | 1 | Bank 1 simm presence test |
| 1 | 0 | 0 | G | 0 | 1 | 0 | 0 | Test for no memory present |
| 1 | 0 | 0 | G | 0 | 1 | 0 | 1 | Test for simm size, bank 0 |
| 1 | 0 | 0 | G | 0 | 1 | 1 | 0 | Test for simm size, bank 1 |

| | | 1 | 2 | 3 | 4 | 5 | 6 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | G | 0 | 1 | 1 | 1 | Re-map available memory |
| 1 | 0 | 0 | G | 1 | 0 | 0 | 0 | Refresh test |
| 1 | 0 | 0 | G | 1 | 0 | 0 | 1 | Dram array test |
| 1 | 0 | 0 | G | 1 | 0 | 1 | 0 | Save dram configuration and size |
| 1 | 0 | 0 | G | 1 | 0 | 1 | 1 | Set the stack pointer and jump to manufacturing tests |

1 = On, 0 = Off
G = On, Green
Ethernet activity LEDs and LEDs 7, 8, 9 and 10 are not used during the built-in self-tests.
Upon detection of a hardware failure LED 1 and LED 2 will change in color from Green to Amber.

# 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-2 shows the states that are possible for each of the module's LEDs.

**Table A-2: Module LED States After Self-Test Completion**

| 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 | Non-fatal failure. |
| Network OK 1 and 2  | Ethernet port is not connected to a properly terminated and operational LAN. | Ethernet port is connected to a properly terminated and operational LAN. | Port hardware failed self-test. | Port is in backup or listening state or management is disabled. |
| Network Activity 1  | No network activity. | Connected through front. | Connected through back. | Flashes more rapidly and appears brighter as network traffic increases. |

| LED Name | Off | On (Green) | On (Yellow) | Flashing |
|---|---|---|---|---|
| Network Activity 2 → | No network activity. | Connected through front or AUI. | Connected through back. | Flashes more rapidly and appears brighter as network traffic increases. |
| ISDN Ports 7-18 | The module is not connected, or the DSU/CSU port is not powered up, or indicates port failure | Indicates normal operation. | N/A | Indicates self-test mode or management is disabled. |
| Serial Line Ports 3-6 OK | The module is not connected, or the DSU/CSU port is not powered up, or indicates port failure | Indicates normal operation. | N/A | Indicates self-test mode or management is disabled. |

# 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-3 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-3: LED States**

| 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 *DEChub 900 MultiSwitch Owner's Manual.* |
| | 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 *DEChub 900 MultiSwitch Owner's Manual.* |
| | 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 *DEChub 900 MultiSwitch Owner's Manual.* |

| Symptom | Probable Cause | Corrective Action |
|---|---|---|
| Power LED is off (cont.) | If the DEChub does not have enough power to turn on the module, then the module will not power up. | Increase the power capability of the DEChub 900 by adding on an optional power supply. |
| | 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 1 minute 40 seconds (8 MB), reseat the module to repeat the self-test. If the self-test fails again, replace the module. |
| Module OK LED is flashing | Possible fan failure. | Replace the module. |
| Network OK LED 1 and 2 does not stay on after the functional code begins execution. | The network interface self-test has failed. | Refer to the *System Software Guide* to determine the network interface status and to display any logged network interface events. |
| Network Activity LED is off. | There is low network activity or no network activity. | Ensure there is network activity. If the Network Activity LED still fails to turn on, turn the unit off momentarily by removing it from the power supply. Check that the Network Activity LED blinks momentarily during the LED powerup self test. |

*Continued on next page*

| Symptom | Probable Cause | Corrective Action |
|---|---|---|
| Network Activity LED is off (cont.) | The module or any other unit in the DEChub may not be connected to an active segment. | Connect a known active segment to any unit in the DEChub. |
| | If the module is connected to a known active segment and the Network Activity LED is off, then the module is defective. | Replace the module. |
| ISDN Ports 7-18 OK LED does not stay on after the functional code begins execution. | Ports 7-18 interface self-test has failed. | Refer to *the System Software Guide* to determine the serial port interface status and to display any logged serial port interface events. |
| Serial Line Ports 3-6 OK LED does not stay on after the functional code begins execution. | Port 2-5 interface self-test has failed. | Refer to *the System Software Guide* to determine the serial port interface status and to display any logged serial port interface events. |
| After correctly installing the module on a DEChub 900 MultiSwitch, the information display does not read:<br>`RtAbt Cntrl EI/MP up` | Defective module. | Replace the module. |
| After correctly installing the module on a DEChub 900 MultiSwitch, the hub manager does not display configuration information. | Defective module. | Replace the module. |

# Appendix B

# Connectors, Adapters and Cable Connections

## Overview

### Introduction

This appendix shows detailed illustrations of the connectors, adapters, pin assignments and cable connections used on the RouteAbout Central EI.

### In This Appendix

# Connector Assignments

## 50-pin Connector

The following illustration shows the 50-pin connector and its pin assignments.

**Figure B-1: 50-pin Connector**

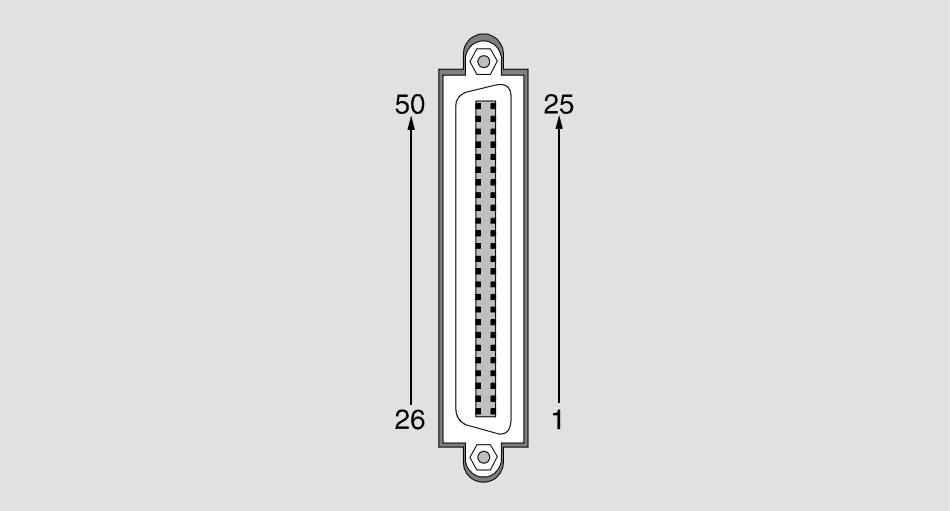



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**Table B-1: 50-pin Connector Assignments**

| Pin | Assignment | Pin | Assignment |
|---|---|---|---|
| 1 | Code Ground[1] | 2 | Cable_ID<1> |
| 3 | N/C | 4 | DSR A |
| 5 | TX Data A | 6 | DCD A |
| 7 | TX Data A | 8 | RTS A |
| 9 | CTS A | 10 | RX Data A |
| 11 | Ring Indicate | 12 | N/C |
| 13 | RX Clock A | 14 | DTR A |
| 15 | TX Clock A | 16 | N/C |
| 17 | TX Clock A | 18 | N/C |
| 19 | TX Clock A | 20 | LBK |
| 21 | V.35 TX Clock A | 22 | V.35 Clock A |
| 23 | V.35 RX Data A | 24 | V.35 TX Data A |
| 25 | V.35 RX Clock A | 26 | Cable_ID<0> |
| 27 | Cable_ID<2> | 28 | N/C |
| 29 | DSR B | 30 | TX Data B |
| 31 | DCD B | 32 | RTS A |
| 33 | RTS B | 34 | CTS B |
| 35 | RX Data B | 36 | N/C |
| 37 | DTE Ground[1] | 38 | RX Clock B |
| 39 | DTR B | 40 | TX Clock B |
| 41 | N/C | 42 | TX Clock B |
| 43 | N/C | 44 | DTR A |
| 45 | N/C | 46 | V.35 TX Clock B |
| 47 | V.35 Clock B | 48 | V.35 RX Data B |
| 49 | V.35 TX Data B | 50 | V.35 RX Clock B |

[1] Contacts tied together.

## 10BaseT Port (8-pin MJ) Connector

The following illustration shows the 8-pin MJ crossover connector and its pin assignments:

**Figure B-2: 8-pin MJ Connector**

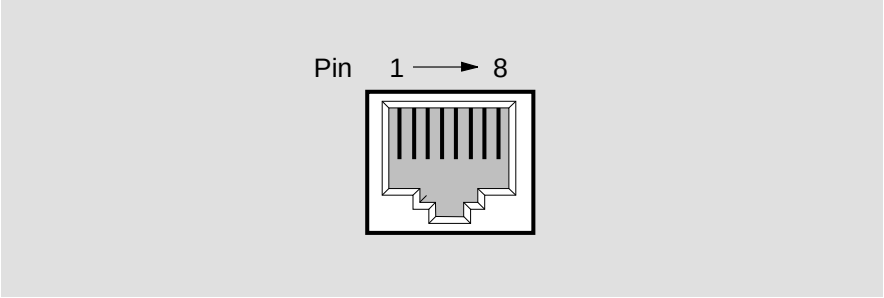


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**Table B-2: 8-pin Connector Assignments**

| Pin | Assignment | Pin | Assignment |
|---|---|---|---|
| 1 | RX+ | 5 | Unused |
| 2 | RX- | 6 | TX- |
| 3 | TX+ | 7 | Unused |
| 4 | Unused | 8 | Unused |

## ISDN (8-pin MJ) Connector

The following illustration shows the ISDN 8-pin MJ connector and its pin assignments:

**Figure B-3: ISDN 8-pin MJ Connector**

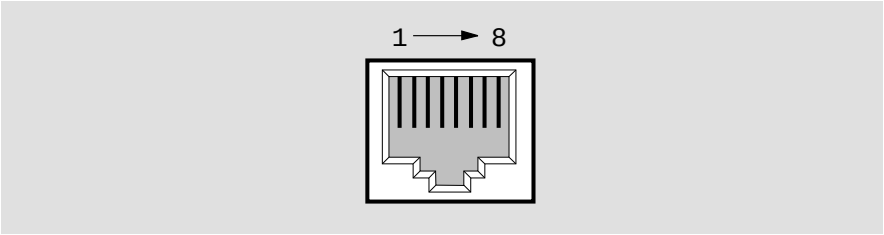


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**Table B-3: ISDN 8-pin MJ Assignments**

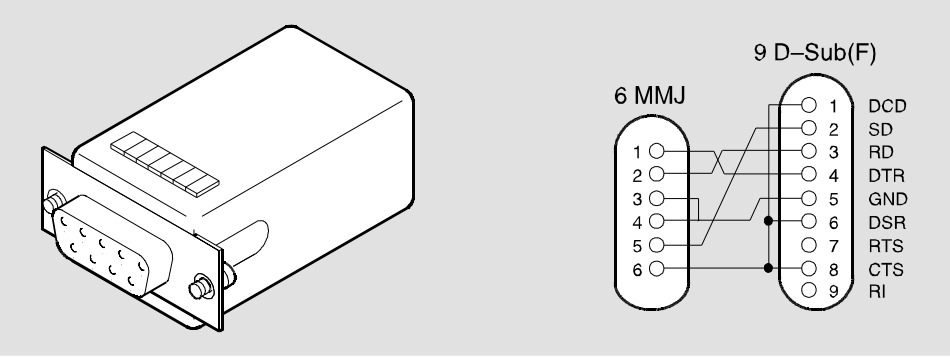
| Pin No. | Assignment | Pin No. | Assignment |
|---|---|---|---|
| 1 | Unused | 5 | RX- |
| 2 | Unused | 6 | TX- |
| 3 | TX+ | 7 | Unused |
| 4 | RX+ | 8 | Unused |

# Adapters

## H8571-J Adapter

The following illustration shows the H8571-J adapter (6-pin MMJ connector to 9-pin D-Sub connector) and its pin assignments:

**Figure B-4: H8571-J Adapter**

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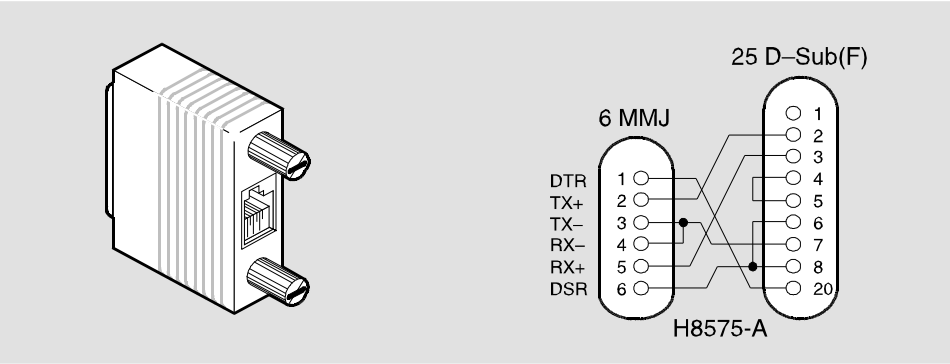
## H8575-A Adapter

The following illustration shows the H8575-A adapter (6-pin MMJ connector to 25-pin D-Sub connector) and its pin assignments:

**Figure B-5: H8575-A Adapter**

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# Cable Connections

The following tables list the proper cable connections for the X.21, EIA422, V.35, EIA530A, EIA423, and V.24/EIA232 standards.

**Table B-4: X.21 Cable Connections (BC12F-06, 17-03580-01)**

| From Pin Connector (P1) | To X.21 Pin Connector (P2) | Signal Name |
|---|---|---|
| 1, 2, 26 | – | Code Ground[1] |
| 5 | 2 | T(A) TX Data A |
| 30 | 9 | T(B) TX Data B |
| 6 | 5 | I(A) DCD A |
| 31 | 12 | I(B) DCD B[2] |
| 8 | 3 | C(A) RTS A |
| 33 | 10 | C(B) RTS B |
| 10 | 4 | R(A) RX Data A |
| 35 | 11 | R(B) RX Data B[2] |
| 17 | 6 | S(A) TX Clock A |
| 22 | 13 | S(B) TX Clock B[2] |
| 13, 15 | - | RX Clock A<br>DTE Clock B[1] |
| 38, 40 | - | RX Clock B<br>DTE Clock B[2] |
| 37 | 8 | G DTE Ground |

[1] Contacts tied together.

[2] 120 OHM resistor, 1/2w between pins 6 and 31, 10 and 35, 17 and 42. The resistors are at the P1 end of the cable.

**Table B-5: EIA422/V.11/V.36 Cable Connections (BC12H–06, 17–03767–01)**

| From Pin Connector (P1) | To EIA422 Pin Connector P2) | Signal Name |
|---|---|---|
| 1, 27 | – | Code Ground[1] |
| 4 | 11 | DSR A |
| 29 | 29 | DSR B |
| 5 | 4 | TX Data A |
| 30 | 22 | TX Data B |
| 6 | 13 | DCD/I A |
| 31 | 31 | DCD/I B |
| 8 | 7 | RTS/C A |
| 33 | 25 | RTS/C B |
| 9 | 9 | CTS A |
| 34 | 27 | CTS B |
| 10 | 6 | RX Data A |
| 35 | 24 | RX Data B[2] |
| 11 | 15 | Ring Indicate |
| 12 | 20 | DCE Ground |
| 13 | 8 | RX Clock A |
| 38 | 26 | RX Clock B[2] |
| 14 | 12 | DTR A |
| 39 | 30 | DTR B |

*Continued on next page*

| From Pin Connector (P1) | To EIA422 Pin Connector P2) | Signal Name |
|---|---|---|
| 15 | 17 | Clock A |
| 40 | 35 | Clock B |
| 17 | 5 | TX Clock A |
| 42 | 23 | TX Clock B[2] |
| 18 | 18 | Test Indicate |
| 37 | 19, 37 | DTE Ground[1] |
| 20 | 10 | Local Loop |
| 41 | 16 | Speed Select |
| 45 | 14 | Remote Loop |
| Shell | Shell | Shield Braid |

[1] Contacts tied together.

[2] 120 OHM resistor, 1/2w between pins 10 and 35, 13 and 38, 17 and 42. The resistors are at P1 end of cable.

**Table B-6: V.35 Connection (BC12G-06, 17-03766-01)**

| From Pin Connector (P1) | To V.35 Pin Connector (P2) | Signal Name |
|---|---|---|
| 1, 26 | – | Code Ground[1] |
| 4 | E | DSR A |
| 6 | F | DCD/I A |
| 9 | D | CTS A |
| 11 | J | Ring Indicate |
| 21 | Y | TX Clock A |
| 46 | A | TX Clock B |
| 22 | U | Clock A |
| 47 | W | Clock B |
| 23 | R | RX Data A |
| 48 | T | RX Data B |
| 24 | P | TX Data A |
| 49 | S | TX Data B |
| 25 | V | RX Clock A |
| 50 | X | RX Clock B |
| 32 | C | RTS |
| 12, 29, 31, 34, 37 | B | DTE Ground[1] |
| 44 | H | DTR |
| Shell | Braid Strap | Overall Cable Shield |
| 20 | K | Local Loop |

[1]Contacts tied together.

**Table B-7: EIA530A Cable Connections (BC12J-06, 17-03760-01)**

| From Pin Connector (P1) | To EIA530A Pin Connector (P2) | Signal Name |
|---|---|---|
| 1, 26, 27 | – | Code Ground[1] |
| 4 | 6 | DSR A |
| 5 | 2 | TX Data A |
| 30 | 14 | TX Data B |
| 6 | 8 | DCD/I A |
| 31 | 10 | DCD/I B |
| 8 | 4 | RTS/C A |
| 33 | 19 | RTS/C B |
| 9 | 5 | CTS A |
| 34 | 13 | CTS B |
| 10 | 3 | RX Data A |
| 35 | 16 | RX Data B[2] |
| 11 | 22 | Ring Indicate |
| 12 | 23 | DCE Ground |
| 13 | 17 | RX Clock A |
| 38 | 9 | RX Clock B[2] |
| 15 | 24 | Clock A |
| 40 | 11 | Clock B |
| 17 | 15 | TX Clock A |
| 42 | 12 | TX Clock B[2] |
| 18 | 25 | Test Indicate |
| 20 | 18 | Local Loop |
| 29, 37 | 7 | DTE Ground[1] |

| From Pin Connector (P1) | To EIA530A Pin Connector (P2) | Signal Name |
|---|---|---|
| 44 | 20 | DTR |
| 45 | 21 | Remote Loop |
| Shell | Shell | Shield Braid |

[1] Contacts tied together.

[2] 120 OHM resistor, 1/2W between pins 10 and 35, 13 and 38, 17 and 42. The resistors are at P1 end of cable.

**Table B-8: EIA423/V.10 Cable Connections (BC12K-06, 17-03761-01)**

| From Pin Connector (P1) | To EIA423 Pin Connector (P2) | Signal Name |
|---|---|---|
| 1, 2, 27 | – | Code Ground[1] |
| 4 | 11 | DSR A |
| 29 | 29 | DSR B |
| 6 | 13 | DCD/I A |
| 31 | 31 | DCD/I B |
| 7 | 4 | TX Data |
| 9 | 9 | CTS A |
| 34 | 27 | CTS B |
| 10 | 6 | RX Data A |
| 35 | 24 | RX Data B |
| 11 | 15 | Ring Indicate |
| 12 | 20 | DCE Ground |
| 13 | 8 | RX Clock A |
| 38 | 26 | RX Clock B |
| 17 | 5 | TX Clock A |
| 42 | 23 | TX Clock B |
| 18 | 18 | Test Indicate |
| 20 | 10 | Local Loop |
| 32 | 7 | RTS/C |
| 37 | 19, 22, 25, 30, 35, 37 | DTE Ground[1] |
| 41 | 16 | Speed Select |
| 44 | 12 | DTR |
| 45 | 14 | Remote Loop |
| Shell | Shell | Shield Braid |

| From Pin Connector (P1) | To EIA423 Pin Connector (P2) | Signal Name |
|---|---|---|
| 19 | 17 | Clock |

[1]Contacts tied together.

**Table B-9: V.28/EIA232 Cable Connections (BC12L-06, 17-03762-01)**

| From Pin Connector (P1) | To V.24/EIA232 Pin Connector (P2) | Signal Name |
|---|---|---|
| 1, 2 | – | Code Ground[1] |
| 4 | 6 | DSR A |
| 6 | 8 | DCD/I A |
| 7 | 2 | TX Data |
| 9 | 5 | CTS A |
| 10 | 3 | RX Data A |
| 11 | 22 | Ring Indicate |
| 13 | 17 | RX Clock A |
| 17 | 15 | TX Clock A |
| 18 | 25 | Test Indicate |
| 19 | 24 | Clock |
| 20 | 18 | Local Loop |
| 32 | 4 | RTS |
| 12, 29, 31, 34, 35, 37, 38, 42 | 7 | DTE Ground[1] |
| 41 | 23 | Speed Select |
| 44 | 20 | DTR |
| 45 | 21 | Remote Loop |

[1] Contacts tied together.

# Appendix C

# Installation Information – United Kingdom

## Overview

This appendix contains the installation information, which is required for the United Kingdom only.

### In This Appendix

# Power Rating, Module Isolation and Safety Status

## Host Power Rating

Digital has designed all permutations of the host configuration to operate within the limits of the host power rating as shown in Table C-1.

**Table C-1: Module Power**

| Input Voltage | Max. Input Current (Amperes) |
|---|---|
| 5Vdc | 5.25 amps |
| 12Vdc | 0.12 amps |
| 15Vdc | 0.40 amps |

## Module Isolation

No special clearances or creepage distances need to be maintained as the RouteAbout Central EI is contained within its own cabinet, which meets all clearances for PTT approval.

## Safety Status

All interconnection points on this product are SELV circuits and should only be connected to products with like SELV circuits.

# Cable Approval

The module is approved for direct connection to a particular digital circuit. This approval includes an interconnecting cable with mating connectors that conform to the British standard BS6623, parts 1 and 4. If the module is connected to the service with anything other than its own approved cables, those cables must benefit from relevant general approval NS/G/1235/100009 or conform to any other applicable requirements, or both.

## Supported Cables

Digital supports all of the cables in Table C-2. The approved module may not use all of these cables; therefore, check the instructions to determine which interface types are supported.

**Table C-2: Cables Supported by the Approved Module**

| Interface | Cable Type | Name | Molding | Pins |
|---|---|---|---|---|
| V.24/V.28 | Adapter | BC12L-06 | Straight | 50-25 |
| V.24/V.28 | Extension | BC22F-xx[1] | – | – |
| V.24/V.28 | Extension low cap | BC13P-10[1] | – | – |
| V.10 | Adapter | BC12K-06 | Straight | 50-37 |
| V.35 | Adapter | BC12G-06 | Straight | 50-34 |
| V.35 | Extension | BC19L-xx[1] | – | – |
| X.21 | Adapter | BC12F-06 | Straight | 50-15 |
| X.21 | Extension | BC22Z-xx[1] | – | – |

[1] Where xx is the length in feet. Total cable length with extension should never exceed 27 feet.

## Equipment Between the Approved Module and a Digital Circuit (PTT)

If you are going to connect any other equipment, including cables or wiring, between the approved module and the point of connection to any particular digital circuit, then that equipment must conform to the following standards:

- The overall transmission characteristics of all other equipment must not have any material effect on the electrical conditions between the equipment and the digital circuit.
- The equipment must be approved, which may be subject to limitations on its use, for the purpose of connection between it and a particular digital circuit.
- Cable or wiring must comply with a code of practice for the installation of equipment covered by this standard or other requirements that may be applicable.

# Appendix D

# Product Specifications

## Overview

This appendix lists the specifications and available parts for the RouteAbout Central EI.

### In This Appendix

# Product Specifications

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

**Table D-1: Product Specifications**

| Parameter | Specification |
|---|---|
| **Environment** | |
| Operating Temperature[1] | 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) |
| • Non-operating | Sea level to 4900 m (16,000 ft) |
| Power | 32 W @ 6.0 amps, total power[2]<br>5.25 A, 5Vdc, 26 W<br>0.12 A, 12Vdc, n/a<br>0.40 A, 15Vdc, 6 W |
| **Physical** | |
| Height | 44.45 cm (17.5 in) |
| Width | 4.45 cm (1.75 in) |
| Depth | 15.20 cm (6.0 in); 25.40 cm (10.0 in) when installed as a standalone unit. |
| Weight | 2.11 kg (4.65lb) standalone; 3.52 kg (7.75 lb) when installed in the DEHUA DEChub ONE. |

**Shock (Class A/B for products weighing under 100 lbs)**

10 G / 10 ms half sine pulse in three orthogonal axes

**Vibration (Class C)**

5 to 200 Hz sine sweep @ 0.25 G limited by 0.02" (0.5mm) displacement DA* 200 to 500 Hz sine sweep @ 0.10 G

**Certification**

CE, CSA, FCC, TÜV, UL, VCCI

[1]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.

[2]The 12Vdc power in the DEChub 900 is derived from the 15Vdc power source. Although it is listed separately in the product specifications, the 12Vdc requirements are included in the 15Vdc power total.

# Acoustical Specifications

Table D-2 lists the acoustical specifications for the module in English. Table D-3 lists the acoustical specifications in German.

**Table D-2: Acoustical Specifications**

**Declared Values per ISO 9296 and ISO 7779**[1]

| Product | Sound Power Level $L_{WAd}$, B | Sound Pressure Level $L_{pAm}$, dBA (bystander positions) |
|---|---|---|
| | **Idle/Operate** | **Idle/Operate** |
| DEZBR RouteAbout Central EI | 4.9 | 35 |
| DEZBR + DEHUA RouteAbout Central EI + DEChub ONE docking station | 5.3 | 39 |
| DEZBR + DEF1H RouteAbout Central EI + DEChub ONE-MX docking station | 5.3 | 39 |

[1] Current values for specific configurations are available from Digital Equipment Corporation representatives. 1 B = 10 dBA.

**Table D-3: Aktuelle Werte für spezielle Produkt**

**Schallemissionswerte Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779**[2]

| Produkt | Schalleistungspegel $L_{WAd}$, B | Schalldruckpegel $L_{pAm}$, dBA (Zuschauerpositionen) |
|---|---|---|
| | **Leerlauf/Betrieb** | **Leerlauf/Betrieb** |
| DEZBR RouteAbout Central EI | 4,9 | 35 |
| DEZBR + DEHUA RouteAbout Central EI + DEChub ONE docking station | 5,3 | 39 |
| DEZBR + DEF1H RouteAbout Central EI + DEChub ONE-MX docking station | 5,3 | 39 |

[2]Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich. 1 B = 10 dBA.

# Connectors

Table D-4 provides a list connectors for RouteAbout Central EI.

**Table D-4: Connectors for the RouteAbout Central EI**

| Connectors | Quantity |
|---|---|
| 8-pin MJ 10BaseT twisted pair connector | 2 |
| 8-pin MJ ISDN basic rate interface S/T connector | 12 |
| 50-pin WAN connector | 4 |

Table D-5 lists connectors for the DEChub ONE-MX.

**Table D-5: Connectors for the DEChub ONE-MX**

| Connectors | Quantity |
|---|---|
| 8-pin MJ (setup port) | 1 |
| 6-pin MJ (OBR) | 1 |
| DB-9 (OBM) | 1 |
| 15-pin D-SUB (AUI port) | 1 |
| D-Sub (redundant power connector) | 1 |
| MOD PMD slots | 2 |

Table D-6 lists connectors for the DEChub ONE.

**Table D-6: Connectors for the DEChub ONE**

| Connectors | Quantity |
|---|---|
| 8-pin MJ (setup port) | 1 |
| DB-9 (OBM) | 1 |
| 15-pin D-Sub (AUI port) | 1 |

# Parts List

Table D-7 provides a list of available parts for RouteAbout Central EI.

**Table D-7: RouteAbout Central EI Parts List**

| Part | Part Number |
|---|---|
| RouteAbout Central EI | DEZBR-SB (IP protocol package)<br>or DEZBR-RB (MP protocol package) |
| Power Supply Class B, +5 volts and +12 volts | H7867-AA (Use only this power supply.) |
| Console Port Adapter | H8584-AC |
| ISDN Cable | BN25G-03, 17-03212-03 |
| Cable, EIA530A | BC12J-06, 17-03760-01 |
| Cable, RS232/V.28 | BC12L-06, 17-03762-01 |
| Cable, RS422/V.11 | BC12H-06, 17-03767-01 |
| Cable, RS423/V.10 | BC12K-06, 17-03761-01 |
| Cable, V.35 | BC12G-06, 17-03766-01 |
| Cable, X.21 (LL) | BC12F-06, 17-03580-01 |

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## V



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