digital

DIGITAL FDDI Modular Interface

DELHF-UA User's Guide

DIGITAL FDDI Modular Interface

DELHF-UA User's Guide

Part Number: 9032632

September 1998

This manual describes how to use the DELHF-UA module.

Revision/Update Information: This is a new document.

Cabletron Systems reserves the right to make changes in specifications and other information contained in this document without prior notice. The reader should in all cases consult Cabletron Systems to determine whether any such changes have been made.

The hardware, firmware, or software described in this manual is subject to change without notice.

IN NO EVENT SHALL CABLETRON SYSTEMS BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING BUT NOT LIMITED TO LOST PROFITS) ARISING OUT OF OR RELATED TO THIS MANUAL OR THE INFORMATION CONTAINED IN IT, EVEN IF CABLETRON SYSTEMS HAS BEEN ADVISED OF, KNOWN, OR SHOULD HAVE KNOWN, THE POSSIBILITY OF SUCH DAMAGES.

UNITED STATES GOVERNMENT RESTRICTED RIGHTS

The enclosed product (a) was developed solely at private expense; (b) contains “restricted computer software” submitted with restricted rights in accordance with Section 52227-19 (a) through (d) of the Commercial Computer Software - Restricted Rights Clause and its successors, and (c) in all respects is proprietary data belonging to Cabletron and/or its suppliers.

For Department of Defense units, the product is licensed with “Restricted Rights” as defined in the DoD Supplement to the Federal Acquisition Regulations, Section 52.227-7013 (c) (1) (ii) and its successors, and use, duplication, disclosure by the Government is subject to restrictions as set forth in subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at 252.227-7013. Cabletron Systems, Inc., 35 Industrial Way, Rochester, New Hampshire 03867-0505.

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 digital 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.

DOC Notice — Class A Computing Device:
This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

VCCI Notice — Class A Computing Device:

この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Taiwanese Notice — Class A Computing Device:

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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.

Avertissement!
Cet appareil est un appareil de Classe A. Dans un environnement résidentiel cet appareil peut provoquer des brouillages radioélectriques. Dans ce cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.

CABLETRON SYSTEMS, INC. PROGRAM LICENSE AGREEMENT

IMPORTANT: Before utilizing this product, carefully read this License Agreement.

This document is an agreement between you, the end user, and Cabletron Systems, Inc. ("Cabletron") that sets forth your rights and obligations with respect to the Cabletron software program (the "Program") contained in this package. The Program may be contained in firmware, chips or other media. BY UTILIZING THE ENCLOSED PRODUCT, YOU ARE AGREEING TO BECOME BOUND BY THE TERMS OF THIS AGREEMENT, WHICH INCLUDES THE LICENSE AND THE LIMITATION OF WARRANTY AND DISCLAIMER OF LIABILITY. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, PROMPTLY RETURN THE UNUSED PRODUCT TO THE PLACE OF PURCHASE FOR A FULL REFUND.

CABLETRON SOFTWARE PROGRAM LICENSE

1. LICENSE. You have the right to use only the one (1) copy of the Program provided in this package subject to the terms and conditions of this License Agreement.

   You may not copy, reproduce or transmit any part of the Program except as permitted by the Copyright Act of the United States or as authorized in writing by Cabletron.

2. OTHER RESTRICTIONS. You may not reverse engineer, decompile, or disassemble the Program.

3. APPLICABLE LAW. This License Agreement shall be interpreted and governed under the laws and in the state and federal courts of New Hampshire. You accept the personal jurisdiction and venue of the New Hampshire courts.

EXCLUSION OF WARRANTY AND DISCLAIMER OF LIABILITY

1. EXCLUSION OF WARRANTY. Except as may be specifically provided by Cabletron in writing, Cabletron makes no warranty, expressed or implied, concerning the Program (including its documentation and media).

   CABLETRON DISCLAIMS ALL WARRANTIES, OTHER THAN THOSE SUPPLIED TO YOU BY CABLETRON IN WRITING, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PROGRAM, THE ACCOMPANYING WRITTEN MATERIALS, AND ANY ACCOMPANYING HARDWARE.

2. NO LIABILITY FOR CONSEQUENTIAL DAMAGES. IN NO EVENT SHALL CABLETRON OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS, PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR RELIANCE DAMAGES, OR OTHER LOSS) ARISING OUT OF THE USE OR INABILITY TO USE THIS CABLETRON PRODUCT, EVEN IF CABLETRON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. BECAUSE SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, OR ON THE DURATION OR LIMITATION OF IMPLIED WARRANTIES, IN SOME INSTANCES THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU.

SAFETY INFORMATION

CLASS 1 LASER TRANSCEIVERS

THE FAST ETHERNET INTERFACE MODULE, FDDI PORT INTERFACE MODULES, AND ATM INTERFACE MODULES USE CLASS 1 LASER TRANSCEIVERS. READ THE FOLLOWING SAFETY INFORMATION BEFORE INSTALLING OR OPERATING THESE ADAPTERS.

The Class 1 laser transceivers use an optical feedback loop to maintain Class 1 operation limits. This control loop eliminates the need for maintenance checks or adjustments. The output is factory set, and does not allow any user adjustment. Class 1 laser transceivers comply with the following safety standards:

- 21 CFR 1040.10 and 1040.11 U.S. Department of Health and Human Services (FDA).
- IEC Publication 825 (International Electrotechnical Commission).
- CENELEC EN 60825 (European Committee for Electrotechnical Standardization).

When operating within their performance limitations, laser transceiver output meets the Class 1 accessible emission limit of all three standards. Class 1 levels of laser radiation are not considered hazardous.

SAFETY INFORMATION

CLASS 1 LASER TRANSCEIVERS

LASER RADIATION AND CONNECTORS

When the connector is in place, all laser radiation remains within the fiber. The maximum amount of radiant power exiting the fiber (under normal conditions) is -12.6 dBm or 55×10^{-6} watts.

Removing the optical connector from the transceiver allows laser radiation to emit directly from the optical port. The maximum radiance from the optical port (under worst case conditions) is $0.8\ W\ cm^{-2}$ or $8 \times 10^{3}\ W\ m^{2}\ sr\text{-}1$.

Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

DECLARATION OF CONFORMITY

Application of Council Directive(s):	**89/336/EEC** **73/23/EEC**
Manufacturer's Name:	**Cabletron Systems, Inc.**
Manufacturer's Address:	**35 Industrial Way** **PO Box 5005** **Rochester, NH 03867**
European Representative Name:	**Mr. J. Solari**
European Representative Address:	**Cabletron Systems Limited** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG13 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EC Directive 73/23/EEC** **EN 55022** **EN 50082-1** **EN 60950**
Equipment Type/Environment:	**Networking Equipment, for use in a Commercial or Light Industrial Environment.**

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

Manufacturer	Legal Representative in Europe
Mr. Ronald Fotino	Mr. J. Solari
Full Name	Full Name
Principal Compliance Engineer	Managing Director - E.M.E.A.
Title	Title
Rochester, NH, USA	Newbury, Berkshire, England
Location	Location

CONTENTS

APPENDIX A FPIM SPECIFICATIONS

PREFACE

Welcome to the *DIGITAL FDDI Modular Interface DELHF-UA User's Guide*. This manual provides the following information:

- Describes DELHF-UA features.
- Explains how to install the DELHF-UA in a DIGITAL interface module or standalone hub.
- Explains how to configure and monitor the DELHF-UA through Local Management.
- Outlines specifications for the DIGITAL Fiber Distributed Data Interface (FDDI) Modular Interface module.

USING THIS GUIDE

Purpose of this Guide

Read through this guide completely to understand the interface module features, capabilities, and Local Management functions. A general working knowledge of Ethernet and IEEE 802.3 type data communications networks and their physical layer components is helpful when using these devices.

Unless noted differently, the information in this guide applies to the DIGITAL FDDI Modular Interface DELHF-UA module.

In this guide, the DIGITAL FDDI Modular Interface DELHF-UA is also referred to as either the DELHF-UA or the HSIM.

Intended Audience

This manual is intended for use by personnel who will install and initially set up the DELHF-UA modular media interface module.

STRUCTURE OF THIS GUIDE

This manual is organized as follows:

Chapter 1, **Introduction,** describes the features of the DELHF-UA interface module.

Chapter 2, **Installation**, explains how to install FPIMs into the DELHF-UA and how to install the DELHF-UA in an interface module or hub.

Chapter 3, **Local Management**, describes how to access Local Management and use the Local Management screens to manage the DELHF-UA interface module.

Chapter 4, **LANVIEW LEDs**, details the DELHF-UA LANVIEW LEDs that enable you to quickly diagnose network/operational problems.

Chapter 5, **Specifications**, lists the DELHF-UA operating specifications.

Appendix A, **FPIM Specifications**, describes the FDDI Port Interface Modules (FPIMs).

DOCUMENT CONVENTIONS

Throughout this guide, the following symbols are used to call attention to important information.

Note symbol. Calls the reader's attention to any item of information that may be of special importance.

Caution symbol. Contains information essential to avoid damage to the equipment.

Electrical Hazard Warning symbol. Warns against an action that could result in the presence of an electrical hazard.

DOCUMENT TERMS

This guide uses the following terms:

Term	Definition
DELHF-UA	A DIGITAL FDDI High Speed Interface Module (HSIM), provides connectivity and functionality to various Digital modules and standalong hubs through the FDDI technology. Supports two FDDI Port Interface Modules (FPIMs).
FDDI	Fiber Distributed Data Interface, a set of industry standards for high-speed, fiber-optic ring, local area networks.
FPIM	FDDI Port Interface Module, provides use of multi-mode fiber, single mode fiber, unshielded twisted pair, or shielded twisted pair tranceiver ports.
HSIM	High Speed Interface Module, provides additional connectivity/functionality to various DIGITAL interface modules and standalone hubs.

RELATED DOCUMENTATION

Use the following manuals to supplement the procedures and other technical data provided in this manual. This manual references procedures in these manuals, where appropriate, but does not repeat them.

Cabletron Cabling Guide

DIGITAL FDDI Technology Guide

DIGITAL Open DECconnect Structured Wiring System Applications Guide

The documentation for the device in which the DELHF-UA will be installed may assist you with the installation and setup of the DELHF-UA.

The manuals referenced above can be obtained on the World Wide Web in Adobe Acrobat Portable Document Format (PDF) at the following site:

http://www.networks.digital.com/

CORRESPONDENCE

Documentation Comments

If you have comments or suggestions about this manual, send them to DIGITAL Network Products:

Attn.:	Documentation Project Manager
E-MAIL:	doc_quality@lkg.mts.dec.com

World Wide Web

To locate product-specific information, refer to the DIGITAL Network products Home Page on the World Wide Web at the following locations:

North America:	http://www.networks.digital.com
Europe:	http://www.networks.europe.digital.com
Asia Pacific:	http://www.networks.digital.com.au

GETTING HELP

Contact your DIGITAL representative for technical support. Before calling, have the following information ready:

- A description of the failure
- A description of any action(s) already taken to resolve the problem (e.g., changing mode switches, rebooting the unit, etc.)
- The serial and revision numbers of all involved products in the network
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)

SAFETY

OVERVIEW

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

	WARNING	Warns against an action that could result in equipment damage, personal injury, or death.
	VORSICHT	Warnt den Benutzer vor Aktionen, die das Gerät beschädigen, Personen verletzen oder sogar zum Tot führen könnten.
	DANGER	Déconseille à l'utilisateur d'exécuter une action pouvant entraîner des dommages matériels, corporels voire même la mort.
	AVISO	Previene contra una acción que podría dañar el equipo, provocar daños personales o la muerte.
	CAUTION	Contains information essential to avoid damage to the equipment.
	ACHTUNG	Liefert wichtige Informationen, um einen Geräteschaden zu vermeiden.
	ATTENTION	Informations indispensables permettant d'éviter les dommages matériels.
	PRECAUCIÓN	Contiene información esencial para evitar daños al equipo.

SAFETY REQUIREMENTS

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

WARNING	Only qualified personnel should install or service this unit.
VORSICHT	Diese Einheit darf nur von qualifizierten Fachleuten installiert oder gewartet werden.
DANGER	L'installation et la maintenance de cet appareil sont réservées à un personnel qualifié.
AVISO	Sólo el personal cualificado debe instalar o dar mantenimiento a esta unidad.
WARNING	To install the DELHF-UA in a standalone hub, the device MUST be powered down. Ensure that you remove the power cord and ONLY the screws required to remove the chassis cover. Failure to comply could result in an electric shock hazard.
VORSICHT	Um den DELHF-UA in einem selbständigen Hub zu installieren, muß das Gerät ausgeschaltet werden. Stellen Sie sicher, daß das Netzkabel gezogen wird und nur diejenigen Schrauben entfernt werden, die zum Abnehmen des Gehäuses notwendig sind. Andernfalls besteht Elektroschockgefahr.
DANGER	Pour installer l'appareil DELHF-UA sur un concentrateur autonome, mettez cet appareil hors tension. Pour retirer le couvercle du châssis, vérifiez que vous avez débranché le cordon d'alimentation et que vous avez uniquement retiré les vis nécessaires. Respectez ces consignes de sécurité pour éviter les risques d'électrocution.

AVISO	Para instalar DELHF-UA en un hub autónomo, el dispositivo SE DEBE apagar. Asegúrese de retirar el cable de alimentación y SÓLO los tornillos que se requieren para retirar la cubierta del chasis. Si no se cumple con estos requisitos, se podrían provocar electrochoques.
WARNING	Ensure that the chassis cover is in place before reconnecting the power cord.
VORSICHT	Das Gehäuse sollte ordnungsgemäß angebracht sein, bevor das Netzkabel wieder angeschlossen wird.
DANGER	Avant de rebrancher le cordon d'alimentation, vérifiez que le couvercle du châssis est bien en place.
AVISO	Asegúrese de que la cubierta del chasis esté en su sitio antes de volver a conectar el cable de alimentación.

CAUTION	The DELHF-UA, FPIMs, and the host module or hub are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damage to this equipment.
ACHTUNG	Der DELHF-UA, FPIMs und das Host-Modul bzw. der Hub sind für statische Entladungen empfindlich. Benutzen Sie deshalb ein Antistatikarmband, und beachten Sie während dieses Verfahrens alle diesbezüglichen Vorsichtsmaßnahmen. Bei Nichtbeachtung könnte das Gerät beschädigt werden.
ATTENTION	L'appareil DELHF-UA, les connecteurs FPIM et le concentrateur ou le module hôte sont sensibles à l'électricité statique. Au cours de cette procédure, utilisez des bracelets antistatiques et respectez toutes les précautions relatives à l'électricité statique. Si vous ne tenez pas compte de ces conseils, vous risquez d'endommager cet équipement.
PRECAUCIÓN	DELHF-UA, FPIMs y el hub o módulo de host es sensible a la descarga estática. Utilice una banda antiestática para la muñeca y observe todas las precauciones sobre estática durante este procedimiento. Si no se cumple con estos requisitos, se puede dañar el equipo.
CAUTION	When mating the FPIM connector to the DELHF pins, take extra care that the pins do not enter the connector at an angle to avoid damaging both the FPIM connector and the DELHF pins.
ACHTUNG	Beachten Sie, daß der FPIM-Stecker vertikal an den DELHF-Nadeln ausgerichtet eingesteckt wird. Wird er schräg eingesteckt, könnten sowohl der FPIM-Stecker als auch die DELHF-Nadeln beschädigt werden.
ATTENTION	Lorsque vous raccordez le connecteur FPIM aux broches DELHF, veillez à ne pas les raccorder de travers pour ne pas endommager le connecteur FPIM et les broches DELHF.

PRECAUCIÓN	Al acoplar el conector FPIM con las patillas DELHF, tenga mucho cuidado de que las patillas no entren en el conector en un ángulo para evitar daños tanto al conector FPIM, como a las patillas DELHF.
CAUTION	The A and B LEDs will sometimes flash red briefly while performing diagnostics. If they remain red for several minutes, however, it could indicate a hardware failure. If the LEDs remain red, contact your DIGITAL representative.
ACHTUNG	Während der Diagnose könnten die LED-Anzeigen A und B manchmal kurz rot aufleuchten. Wenn sie aber für mehrere Minuten rot bleiben, könnte dies auf einen Hardware-Ausfall hinweisen. Kontaktieren Sie in diesem Fall Ihren DIGITAL-Vertriebsbeauftragten.
ATTENTION	Au cours des diagnostics, il arrive que les voyants A et B clignotent (en rouge). Si ces voyants restent de couleur rouge pendant plusieurs minutes, cela peut signaler un incident matériel. Si cela dure plus longtemps, contactez le représentant DIGITAL du support technique.
PRECAUCIÓN	Los LEDs A y B a veces parpadearán brevemente en rojo mientras se realiza el diagnóstico. Sin embargo, si permanecen rojos durante varios minutos, podrían indicar una falla en el hardware. Si los LEDs permanecen rojos, comuníquese con el representante de DIGITAL.
CAUTION	If the DELHF-UA P and S LEDs remain red for several minutes, the DELHF-UA could have a hardware problem. Contact your DIGITAL representative.
ACHTUNG	Wenn die LED-Anzeigen P und S des DELHF-UA für mehrere Minuten rot bleiben, könnte dies auf einen Hardware-Ausfall beim DELHF-UA hinweisen. Kontaktieren Sie in diesem Fall Ihren DIGITAL-Vertriebsbeauftragten.

ATTENTION	Si les voyants P et S de l'appareil DELHF-UA restent de couleur rouge pendant plusieurs minutes, cela peut signifier qu'il y a un problème matériel sur ce dernier. Contactez le représentant DIGITAL du support technique.
PRECAUCIÓN	Si DELHF-UA P y S LEDs permanecen rojos durante varios minutos, es posible que DELHF-UA tenga un problema de hardware. Comuníquese con el representante de DIGITAL.

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

The DELHF-UA provides additional connectivity/functionality to various DIGITAL interface modules and standalone hubs through the use of FDDI technology. In addition to having a general working knowledge of Ethernet and IEEE 802.3 type data communications networks and their physical layer components, you should also understand FDDI networks and the ANSI X3T9.5 standard prior to installing the DELHF-UA.

The DELHF-UA, shown in Figure 1-1, uses two FPIM (FDDI Port Interface Module) slots to provide the option of using multimode fiber optic, single mode fiber optic, unshielded twisted pair, or shielded twisted pair transceiver ports based on the network requirements.

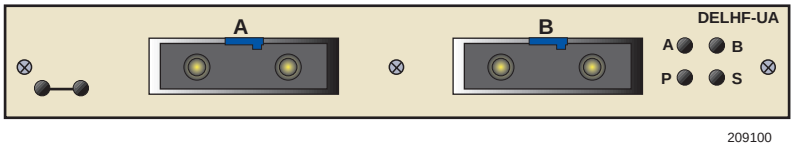


Figure 1-1 The DELHF-UA

The DELHF-UA extends the functionality of certain DIGITAL interface modules or standalone hubs to include high-speed uplink capability. The DELHF-UA allows remote connectivity using FDDI technology.

1.1.1 Features

Connectivity

The DELHF-UA is equipped with slots for FDDI A and B ports. These two ports allow connection to the ring as a Dual Attached Station (DAS) using two FPIMs or as a Single Attached Station (SAS) using one FPIM.

As a DAS, the module or standalone hub that houses the DELHF-UA connects directly to the FDDI primary ring. This provides the reliability of an FDDI dual, counter-rotating ring topology. If one segment of the FDDI ring becomes disabled, this dual ring configuration provides redundancy and restores ring continuity.

As a SAS, the DELHF-UA connects to the primary ring only by using a single FPIM on the DELHF-UA to attach to the M port of an FDDI concentrator.

The DELHF-UA also supports dual homing. A dual homing configuration provides additional redundancy for the module or hub containing the DELHF-UA. Dual homing is a way of connecting to an FDDI ring through the Master (M type) ports of two separate dual attached concentrators. If one M type port or one segment fails, the redundant port or segment activates automatically to retain connection to the ring.

The DELHF-UA is also capable of operating in full duplex mode, which creates a point-to-point link between two FDDI devices. This allows for a data rate of 200 Mbps, with each device transmitting and receiving at 100 Mbps simultaneously. Chapter 3, **Local Management**, provides instructions on configuring the DELHF-UA to operate in full duplex mode.

Bridging

The DELHF-UA provides translational bridging between any channels or ports in its host module or hub and the FDDI ring.

LANVIEW Diagnostic LEDs

DIGITAL provides a visual diagnostic and monitoring system called LANVIEW from Cabletron Systems. The DELHF-UA LANVIEW LEDs help you quickly identify transmit/receive, link, and FDDI ring status. Chapter 4, **LANVIEW LEDs**, provides information on all DELHF-UA LEDs.

1.2 SPECIFICATIONS

This section describes environment specifications and safety requirements for the DELHF-UA. Cabletron Systems reserves the right to change these specifications at any time without notice.

Environment

Operating Temperature:	5°C to 40°C (41°F to 104°F)
Storage Temperature:	-30°C to 73°C (-22°F to 164°F)
Operating Relative Humidity:	5% to 90% (non-condensing)

Regulatory Compliance

Certification:	CE, CSA, C-TICK, FCC, TUV, UL, VCCI
Safety Requirements:	UL 1950, CSA C22.2 No. 950, EN 60950, IEC 950, and 73/23/EEC
Electromagnetic Compatibility (EMC) Requirements:	FCC Part 15, VCCI Class A, EN 55022, CSA C108.8, EN 50082-1, 89/336/EEC AS/NZS 3548

CHAPTER 2
INSTALLATION

This chapter contains instructions for the following items:

- Unpacking the DELHF (Section 2.1)
- Installing FPIMs (Section 2.2)
- Installing a DELHF (Section 2.3)

To install the DELHF and FPIMs, you need the following items:

- Antistatic wrist strap (provided with the MultiSwitch 700 chassis or standalone hub)
- Phillips screwdriver

The DELHF-UA and the host module or hub are sensitive to static discharges. Use a grounding strap and observe all static precautions during this procedure. Failure to do so could result in damage to the DELHF-UA, host module or hub.

2.1 UNPACKING THE DELHF

Unpack the DELHF-UA as follows:

1. Remove the shipping box material covering the DELHF-UA.

2. Carefully remove the module from the shipping box. Leave the module in its non-conductive bag until you are ready to install it.

3. Attach the antistatic wrist strap. If the HSIM is to be installed in a standalone hub, refer to the instructions on the antistatic wrist strap package. If the HSIM is to be installed in an interface module, refer to the applicable interface module User's Guide.

4. After removing the module from its non-conductive bag, visually inspect the device. If you notice any signs of damage, contact your DIGITAL representative.

2.2 INSTALLING FPIMs

Only qualified personnel should install or service this unit.

The DELHF-UA and FPIMs are sensitive to static discharges. Use a grounding strap and observe all static precautions during this procedure. Failure to do so could result in damage to the DELHF-UA or the FPIMs.

To install an FPIM into the DELHF-UA, perform the following steps:

1. Attach the antistatic wrist strap. If the HSIM is to be installed in a standalone hub, refer to the instructions on the antistatic wrist strap package. If the HSIM is to be installed in an interface module, refer to the applicable interface module User's Guide.

2. Refer to Figure 2-1 and remove the two screws from the standoffs. The two screws secure the FPIM coverplate. Save the screws and remove the FPIM coverplate.

3. Refer to Figure 2-2 and remove the three faceplate screws attaching the faceplate to the DELHF-UA. Save the screws.

When mating the FPIM connector to the DELHF-UA pins, take extra care that the pins do not enter the connector at an angle to avoid damaging both the FPIM connector and the DELHF-UA pins.

4. Press the FPIM connector into the HSIM pins.

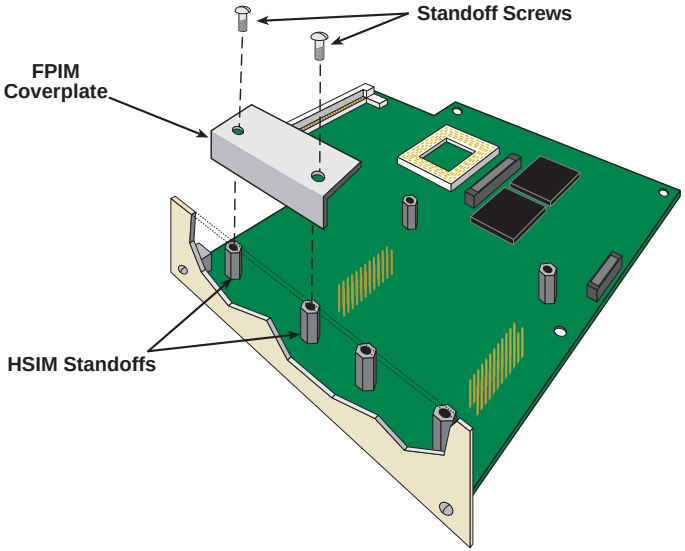


Figure 2-1 Removing the FPIM Coverplate

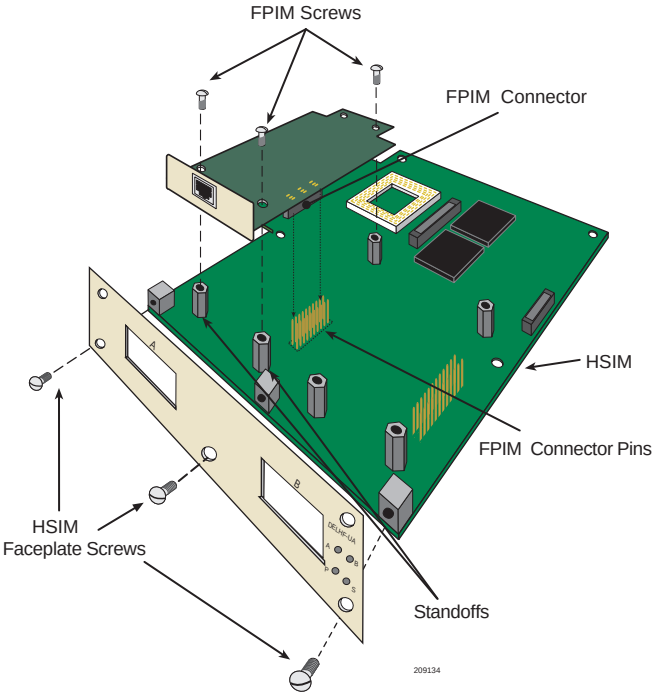


Figure 2-2 Installing FPIMs

5. Press down firmly on the FPIM until the pins slide all the way into the HSIM connector.
6. Secure the FPIM with the screws saved in step 2.
7. Secure the faceplate of the HSIM with the screws saved in step 3.

2.3 INSTALLING AN HSIM

Only qualified personnel should install or service this unit.

You can install an HSIM in any DIGITAL device that supports HSIM technology (e.g., the MultiSwitch 700, DLE32-MA). Refer to the release notes for the version of firmware running on the DIGITAL device to ensure that the DELHF-UA is supported. The following subsections

provide generic instructions for installing a DELHF-UA in an interface module or in a standalone hub. Refer to your specific interface module or standalone hub documentation for exact HSIM slot and connector locations.

2.3.1 Installing an HSIM in an Interface Module

The DELHF-UA and the host module or standalone hub are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damage to the DELHF-UA, the host module or standalone hub.

To install a DELHF-UA in an interface module that supports HSIM technology perform the following steps.

1. Note the ports of the interface module that have cables attached to them. Then disconnect those cables from the ports.
2. Attach the antistatic wrist strap (refer to the instructions outlined in the interface module User's Guide).
3. Unlock the top and bottom plastic locking tabs of the module faceplate.
4. Slide out the module, and place it on its side with the internal components facing up.
5. Refer to Figure 2-3 and remove the two faceplate mounting screws and the HSIM coverplate. Save the screws.
6. Refer to Figure 2-3 and remove the two standoff screws. Save the screws.

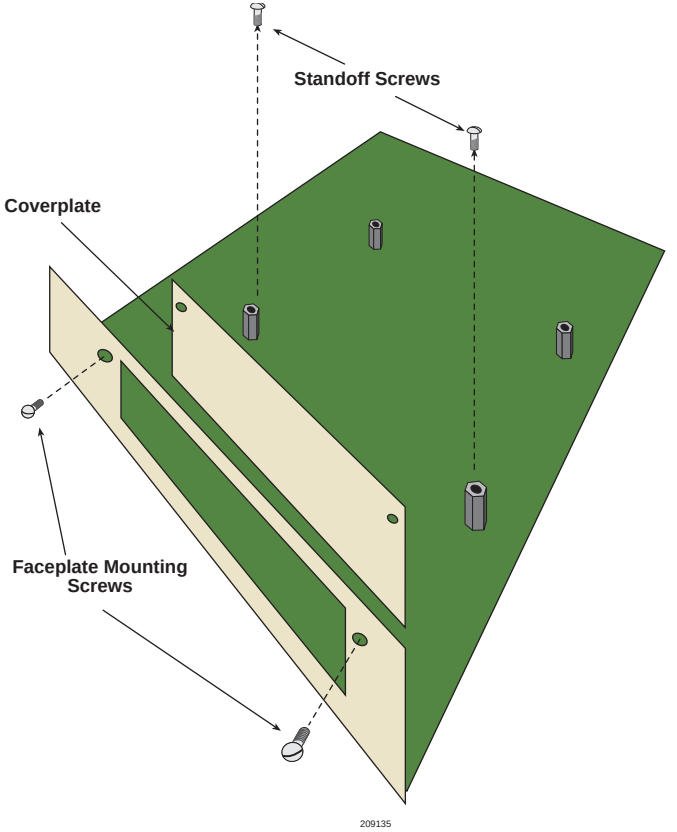


Figure 2-3 Removing the HSIM Coverplate

7. Refer to Figure 2-4 and place the HSIM behind the module faceplate.

8. Align the DELHF connector of the DELHF-UA into the HSIM pins on the module.

9. Press down firmly on the back of the HSIM until the pins slide all the way into the HSIM Connector.

Ensure that the standoffs on the interface module align with the standoff screw holes on the HSIM.

10. Secure the DELHF-UA to the module faceplate using the mounting screws saved in step 5.

11. Secure the DELHF-UA to the module standoffs using the standoff screws saved in step 6.

12. Reinstall the module in the chassis.

13. Reattach the network cabling to the module.

Refer to Chapter 4 for instructions on configuring the DELHF-UA using Local Management.

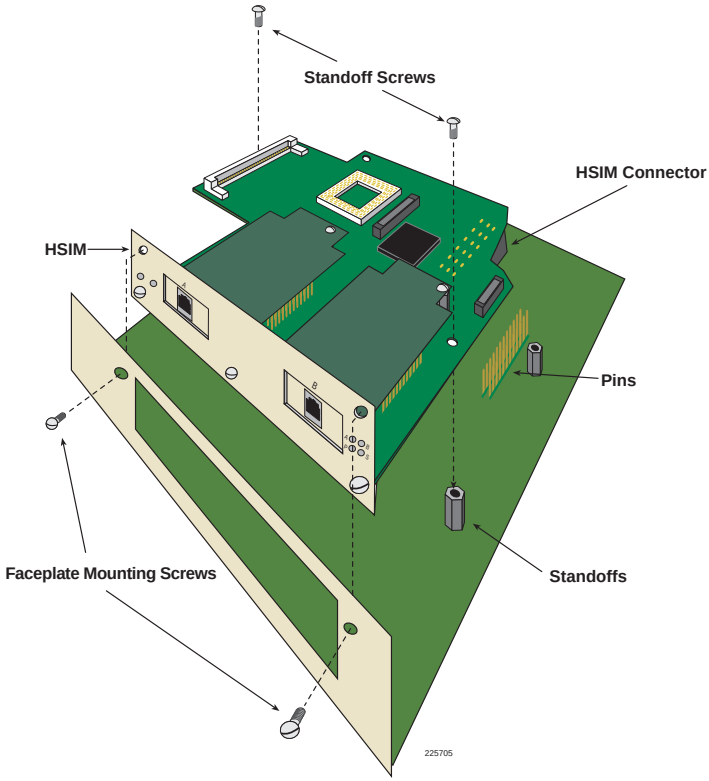


Figure 2-4 Installing the DELHF-UA

2.3.2 Installing a DELHF-UA in a Standalone Hub

To install a DELHF-UA into a standalone hub, perform the following steps:

1. Power down the hub and remove the power cord.
2. Note the ports that have cables attached to them. Then disconnect those cables from the ports.

To install the DELHF-UA in a standalone hub the device MUST be powered down.

Ensure that you remove the power cord and ONLY the screws required to remove the chassis cover. Failure to comply could result in an electric shock hazard.

3. Attach the antistatic wrist strap (refer to the instructions outlined on the antistatic wrist strap package).
4. Remove the hub chassis cover (refer to your specific hub documentation for instructions on removing the hub chassis cover).
5. Refer to Figure 2-3 and remove the two faceplate mounting screws and the DELHF coverplate. Save the screws.
6. Refer to Figure 2-3 and remove the two standoff screws. Save the screws.
7. Place the DELHF-UA behind the hub faceplate.
8. Align the DELHF-UA connector of the DELHF-UA with the pins on the hub.
9. Press down firmly on the back of the DELHF-UA until the pins slide all the way into the DELHF-UA connector holes.

Ensure that the standoffs on the hub align with the standoff screw holes on the DELHF-UA.

10. Secure the DELHF-UA to the module faceplate using the mounting screws saved in step 5.
11. Secure the DELHF-UA to the module standoffs using the standoff screws saved in step 6.

Ensure that the chassis cover is in place before reconnecting the power cord.

12. Reattach the chassis cover to the hub, reconnect the power cord, and reconnect the hub to the network.

Refer to Chapter 3 for instructions on configuring the DELHF-UA using Local Management.

CHAPTER 3
LOCAL MANAGEMENT

This chapter provides instructions on configuring the DELHF-UA to operate in full duplex FDDI mode, viewing DELHF-UA FDDI statistics, translating specific FDDI frame types to specific Ethernet frame types and to viewing the FDDI ring topology using Local Management.

When installed, the DELHF-UA provides additional Local Management features. These features are accessed by entering Local Management of the host interface module or standalone hub. Refer to the host device User's Guide to establish a Local Management connection.

Make sure that the following requirements have been met before configuring the DELHF-UA through Local Management:

- At least one FPIM is installed in the DELHF-UA.
- The DELHF-UA is installed in the host interface module or standalone hub.
- The device is up and running.
- A Local Management terminal is properly configured and connected to the host interface module or standalone hub in which the DELHF-UA resides.

If the DELHF-UA is being configured to operate in full duplex mode, two FPIMs must be installed before proceeding.

To view DELHF-UA FDDI statistics and ring topology, the DELHF-UA must be connected to the FDDI ring.

3.1 LOCAL MANAGEMENT KEYBOARD CONVENTIONS

All key names appear in this manual as capital letters. For example, the Enter key appears as ENTER and the Backspace key appears as BACKSPACE. Table 3-1 explains the keyboard conventions used in this manual as well as the key functions.

Table 3-1 Keyboard Conventions

Key	Function
ENTER Key and RETURN Key	These are selection keys that perform the same Local Management function. For example, “Press ENTER” means that you can press either ENTER or RETURN, unless this manual specifically instructs you otherwise.
SPACE Bar and BACKSPACE Key	These keys cycle through selections in some Local Management fields. Use the SPACE bar to cycle forward through selections and use BACKSPACE to cycle backward through selections.
Arrow Keys	These are navigation keys. Use the UP-ARROW, DOWN-ARROW, LEFT-ARROW, and RIGHT-ARROW keys to move the screen cursor. For example, “Use the arrow keys” means to press whichever arrow key moves the cursor to the desired field on the Local Management screen.

3.1.1 Selecting Local Management Menu Screen Items

Select items on a menu screen by performing the following steps:

1. Use the arrow keys to highlight a menu item.
2. Press ENTER. The selected menu item displays on the screen.

3.1.2 Exiting Local Management Screens

Exit Local Management using the methods described below:

Using the EXIT Command

To exit an LM screen using the **EXIT** command, proceed as follows:

1. Use the arrow keys to highlight the **EXIT** command at the bottom of the Local Management Screen.
2. Press ENTER. The Password screen displays and the session ends.

Using the RETURN Command

1. Use the arrow keys to highlight the **RETURN** command at the bottom of the Local Management screen.
2. Press ENTER. The previous screen in the Local Management hierarchy displays.

The user can also exit Local Management screens by pressing ESC twice. This exit method does not warn about unsaved changes and all unsaved changes will be lost.

3. Exit from Local Management by repeating steps 1 and 2 until the Main Menu screen displays.
4. Use the arrow keys to highlight the **RETURN** command at the bottom of the Main Menu screen.
5. Press ENTER. The Password screen displays and the session ends.

3.2 NAVIGATING LOCAL MANAGEMENT SCREENS

The DELHF-UA Local Management application consists of a series of menu screens. Navigate through Local Management by selecting items from the menu screens. Figure 3-1 shows the hierarchy of the DELHF-UA Local Management screens.

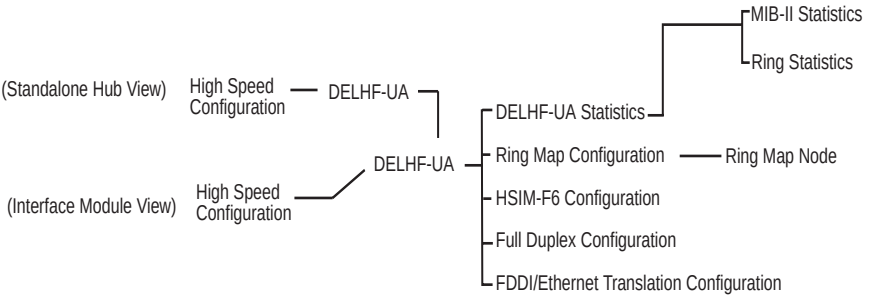


Figure 3-1 DELHF-UA Local Management Hierarchy

3.3 THE DELHF-UA SETUP SCREEN

To access the DELHF-UA Setup screen in a standalone hub (e.g., DLM42-MA), navigate through the Local Management screens until the High Speed Configuration screen displays. Select **DELHF** from the High Speed Configuration screen and press ENTER. The DELHF-UA Setup screen displays. See Figure 3-2.

To access the DELHF-UA Setup screen from an interface module (e.g., DLE32-MA), navigate through the Local Management screens until the Module Specific Configuration Menu screen displays. Select **HIGH SPEED CONFIGURATION** from the Module Specific Configuration Menu screen and press ENTER. The DELHF-UA Setup screen displays. See Figure 3-2.

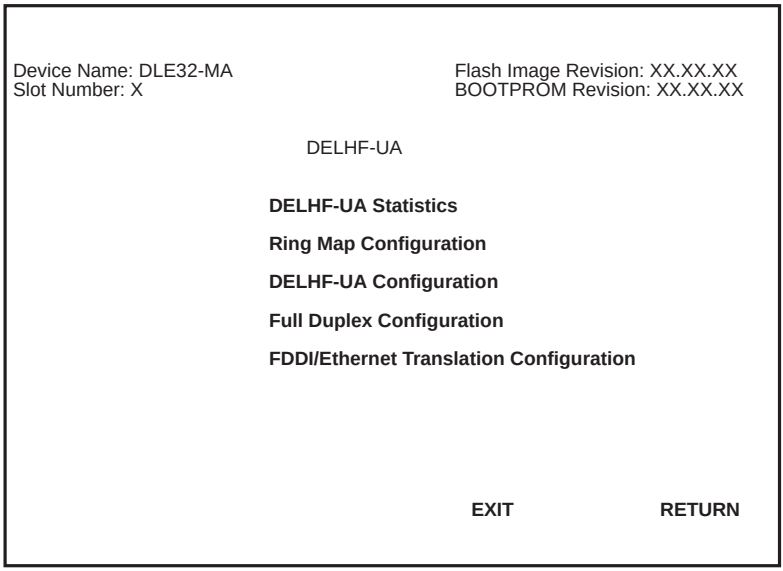


Figure 3-2 The DELHF-UA Setup Screen

The DELHF-UA Setup screen displays five menu items for accessing Local Management screens that allow further configuring and monitoring of the DELHF-UA and the FDDI ring. The following list explains each of the DELHF-UA Setup screen menu items:

DELHF-UA Statistics
Select this menu item to display the DELHF-UA Statistics screen. This screen allows the user to open screens that display the current DELHF-UA FDDI Ring operational status and MIB-II interface statistics.

Ring Map Configuration
Select this menu item to display the Ring Map Configuration screen. The Ring Map Configuration screen contains configuration and connection information and displays the topology of the FDDI ring to which the DELHF-UA is connected. The Ring Map Configuration screen also provides information on all nodes attached to the FDDI ring.

DELHF-UA Configuration
Select this menu item to display the DELHF-UA Configuration screen. This screen allows the user to view the operating requirements that the DELHF-UA advertises to all other stations when it first enters the FDDI ring and to set the interval that the DELHF-UA sends Neighbor Information Frames (NIFs).

Full Duplex Configuration
Select this menu item to display the Full Duplex Configuration screen. This screen allows the user to configure the DELHF-UA to operate in full duplex mode.

FDDI/Ethernet Translation Configuration
Select this menu item to display the FDDI/Ethernet Translation Configuration screen. This screen allows the user to assign specific FDDI to Ethernet frame translations.

3.4 THE DELHF-UA STATISTICS SCREEN

To access the DELHF-UA Statistics screen from the DELHF-UA Setup screen, perform the following steps:

1. Use the arrow keys to highlight the **DELHF-UA Statistics** menu item on the DELHF-UA Setup screen.
2. Press ENTER. The DELHF-UA Statistics screen, Figure 3-3, displays.

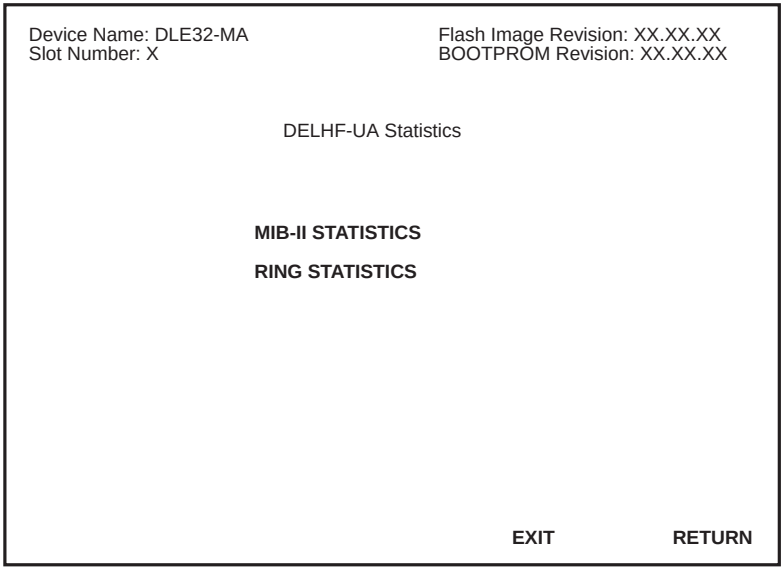


Figure 3-3 The DELHF-UA Statistics Screen

3.4.1 DELHF-UA Statistics Screen Fields

The DELHF-UA Statistics screen allows the user to open screens that display the current DELHF-UA operational status.

The definitions for the DELHF-UA Statistics screen menu items are as follows:

MIB-II STATISTICS
When selected, this menu item opens the MIB-II Interface Statistics screen.

RING STATISTICS
When selected, this menu item opens the Ring Statistics screen.

3.5 THE MIB-II STATISTICS SCREEN

To view the MIB-II interface statistics, use the arrow keys to highlight the **MIB-II STATISTICS** menu item on the DELHF-UA Statistics screen and press ENTER. The MIB-II Interface Statistics screen, Figure 3-4, displays.

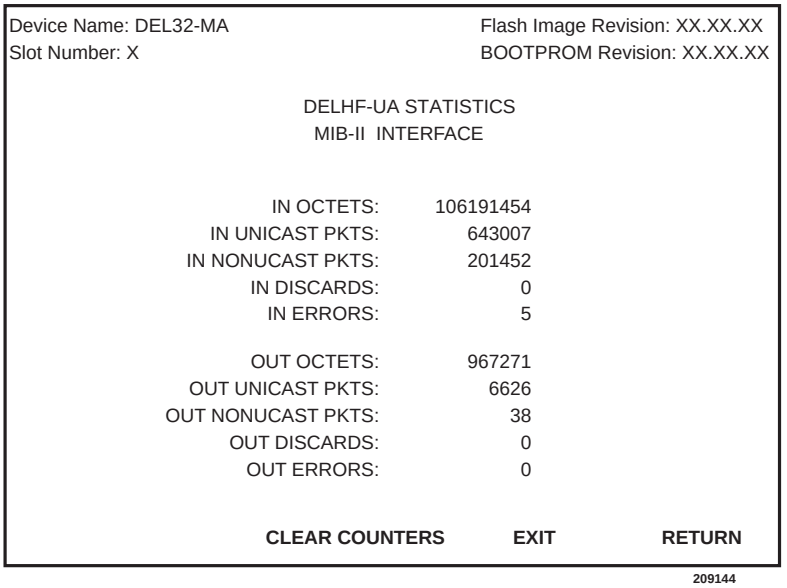


Figure 3-4 The MIB-II Interface Statistics Screen

3.5.1 MIB-II Interface Statistics Screen Fields

The following list describes the MIB-II Statistics screen fields:

IN OCTETS
This field displays the number of octets (bytes) received by the DELHF-UA.

IN UNICAST PKTS
This field displays the number of unicast packets (packets destined for one specific address) received by the DELHF-UA.

IN NONUCAST PKTS
This field displays the number of non-unicast packets (multicast and broadcast packets: packets destined for more than one address) received by the DELHF-UA.

IN DISCARDS
This field displays the total number of packets discarded by the DELHF-UA due to lack of available resources.

IN ERRORS
This field displays the total number of errors (of any type) received by the DELHF-UA.

OUT OCTETS
This field displays the number of octets (bytes) transmitted by the DELHF-UA.

OUT UNICAST PKTS
This field displays the number of unicast packets (packets destined for one specific address) transmitted by the DELHF-UA.

OUT NONUCAST PKTS
This field displays the number of non-unicast packets (multicast and broadcast packets: packets destined for more than one address) transmitted by the DELHF-UA.

OUT DISCARDS
This field displays the total number of packets discarded by the DELHF-UA due to a lack of available resources.

OUT ERRORS
This field displays the total number of errors (of any type) transmitted by the DELHF-UA.

CLEAR COUNTERS
The Clear Counters command resets all counters within the MIB-II Statistics screen to zero. To reset all the counters use the arrow keys to highlight the **CLEAR COUNTERS** field and press ENTER. The counters are now reset to zero.

3.6 THE RING STATISTICS SCREEN

To view the Ring statistics, use the arrow keys to highlight the **RING STATISTICS** menu item on the DELHF-UA Statistics screen and press ENTER. The DELHF-UA FDDI Ring Statistics screen, Figure 3-5, displays.

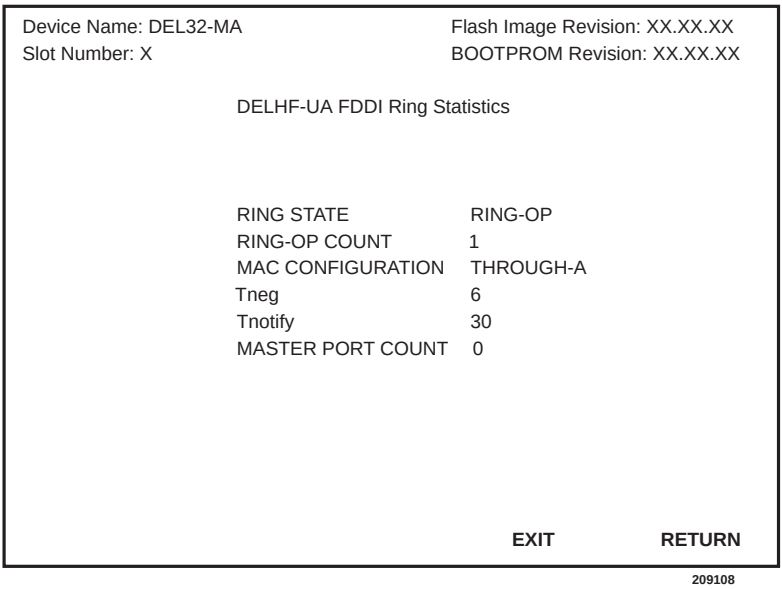


Figure 3-5 The DELHF-UA FDDI Ring Statistics Screen

3.6.1 DELHF-UA FDDI Ring Statistics Screen Fields

The DELHF-UA FDDI Ring Statistics screen allows the user to monitor the current DELHF-UA operational status.

The following list describes the Ring Statistics screen fields:

RING STATE
Displays the current ring state. The possible ring states are as follows:

- **Ring-Op** - The ring is functioning correctly.
- **Isolated** - The DELHF-UA is not attached to the ring.
- **Non-Op** - The DELHF-UA is attempting to enter the ring.

- **Detect -** The claim (beacon) process of the FDDI ring protocol has exceeded one second. There may be a problem.
- **Non-Op-Dup -** The ring failed to complete the claim (beacon) process. This usually indicates a duplicate FDDI address.
- **Ring-Op-Dup -** The ring is operational, but a duplicate FDDI address may be present somewhere on the network.
- **Directed -** The claim (beacon) process did not complete within ten seconds. The DELHF-UA is sending directed beacons to indicate a problem.
- **Trace -** A problem has been detected with the DELHF-UA or the nearest active upstream neighbor (NAUN). A trace is being sent to notify the nearest active upstream neighbor of the problem.

RING-OP COUNT

The Ring-Op Count keeps track of the number of times the FDDI ring has initialized since the last time the DELHF-UA (or host device in which it resides) was reset. If this number grows steadily over a brief period of time, it signifies the ring is unstable.

MAC CONFIGURATION

The MAC Configuration field describes the current configuration of the Media Access Control (MAC) and physical layers of the A and B ports. The possible port configurations are as follows:

- **Through-A -** The flow of the primary ring is entering the MAC from port A (primary ring in) and exiting through port B (primary ring out). The secondary ring is isolated from the MAC with the flow entering from port B (secondary ring in) and exiting through port A (secondary ring out). In a normal ring state the DELHF-UA MAC Configuration should read “Through-A”.

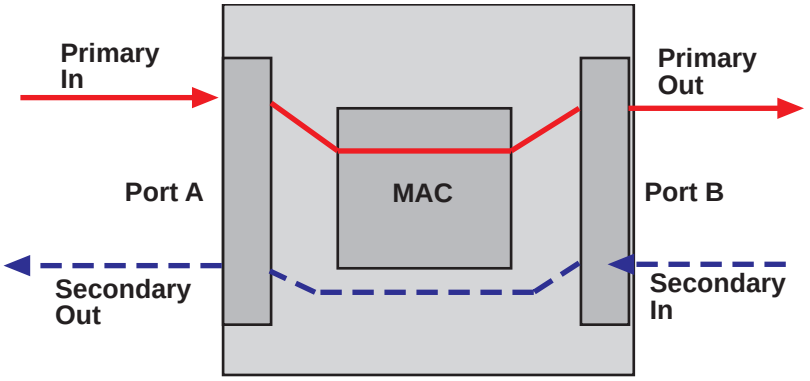


Figure 3-6 Example of Through-A MAC Configuration

- **Wrap-A** - The flow of the primary ring is entering through port A (primary in) and is wrapped by the MAC, causing the ring to exit through port A (secondary out). Port B is disconnected from the ring. If the DELHF-UA MAC Configuration reads “Wrap-A” the ring has lost the redundancy of the secondary ring due to the wrapped condition. This configuration should be repaired, as additional problems could isolate stations from the FDDI ring.

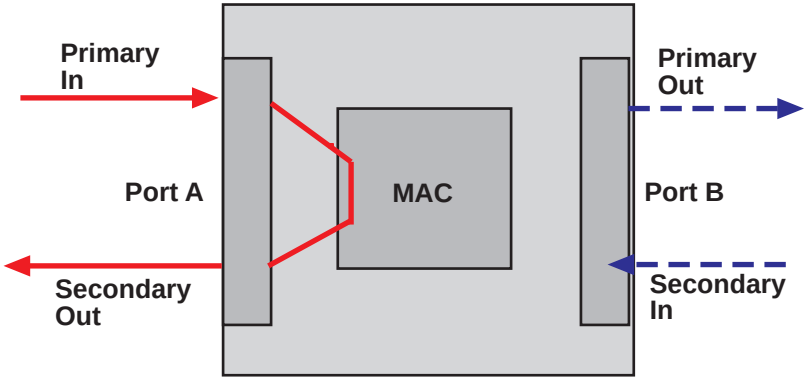


Figure 3-7 Example of Wrap-A MAC Configuration

- **Wrap-B** - The flow of the primary ring is entering through port B (secondary in) and is wrapped by the MAC, causing the ring to exit

through port B (primary out). Port A is disconnected from the ring. If the DELHF-UA MAC Configuration reads “Wrap-B” the ring has lost the redundancy of the secondary ring due to the wrapped condition. This configuration should be repaired, as additional problems could isolate stations from the FDDI ring.

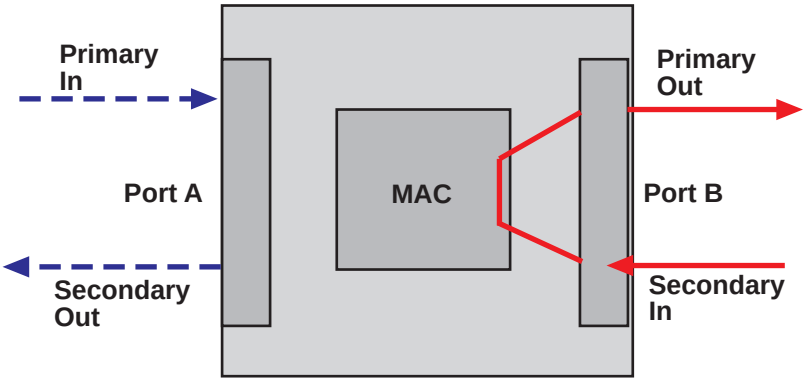


Figure 3-8 Example of Wrap-B MAC Configuration

- **Isolated** - Both port A and port B are isolated from the ring.

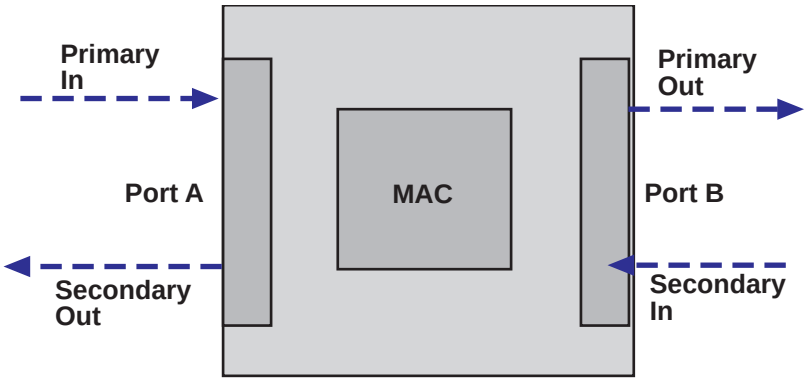


Figure 3-9 Example of Isolated MAC Configuration

- **Wrap-AB** - The flow of the primary ring is entering through port A (primary in) and is wrapped by the MAC, causing the ring to exit through port A (secondary out). The MAC has also wrapped port B, causing the flow of the ring to enter through port B (secondary in) and exit through port B (primary out). The DELHF-UA MAC Configuration can read “Wrap-AB” if the DELHF-UA is in a dual homed configuration.

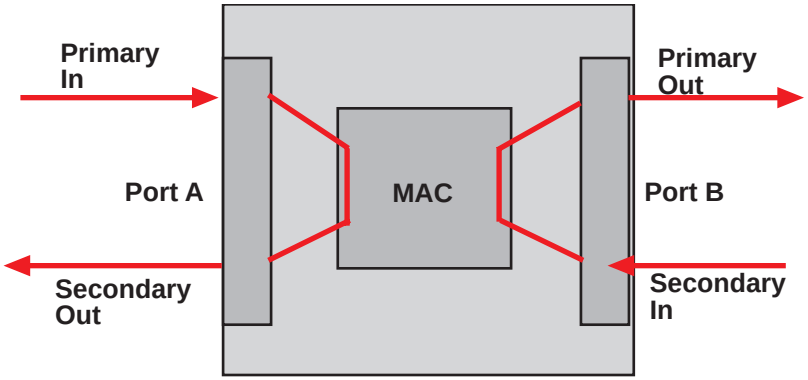


Figure 3-10 Example of Wrap-AB MAC Configuration

Tneg (Time Negotiated)
The Tneg field displays the negotiated token rotation time (in milliseconds) that the devices on the ring established through the token claiming process.

Tnotify
The Tnotify field displays the interval (in seconds) at which the DELHF-UA transmits Neighbor Information Frames (NIFs). The DELHF-UA uses NIFs to periodically announce its address and basic station description.

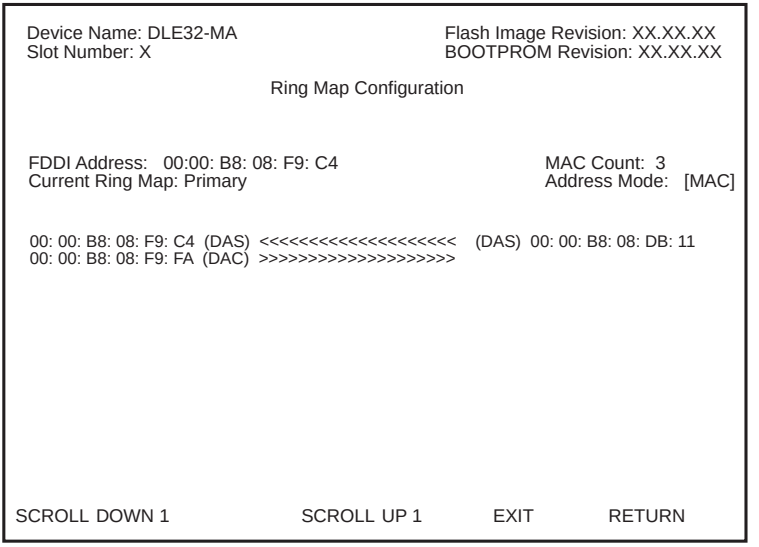
MASTER PORT COUNT
The Master Port Count field displays the number of available M type ports.

3.7 THE RING MAP CONFIGURATION SCREEN

The Ring Map Configuration screen displays FDDI formatted addresses of ring stations in a graphic illustration of the FDDI ring topology, and provides access to a Node Information screen for each device located on the ring.

To access the Ring Map Configuration screen from the DELHF-UA Setup screen, perform the following steps:

1. Use the arrow keys to highlight the **Ring Map Configuration** menu item on the DELHF-UA Setup screen.
2. Press ENTER. The Ring Map Configuration screen, Figure 3-11, displays.



209141

Figure 3-11 The Ring Map Configuration Screen

Under some conditions the display must remain on the screen for at least 30 seconds to accurately reflect ring configuration. A neighbor time-out can take as long as 228 seconds to update on the ring map.

3.7.1 Ring Map Configuration Screen Fields

The Ring Map Configuration screen displays the addresses and sequence of each FDDI device attached to the ring. When first displayed, the station at the upper left corner of the ring is this station (DELHF-UA). The Ring Map Configuration screen displays node class, node address, and twisted and/or wrapped conditions (T for twisted and/or W for wrapped) in parentheses. The following list provides the node class possibilities:

NAS - (Null Attached Station) Isolated station; station not connected to an FDDI Ring.

DAS - (Dual Attached Station) Station does not support M (Master) ports, but does connect directly to an FDDI primary and secondary ring using A and B ports.

DAC - (Dual Attached Concentrator) Station that supports M (Master) ports and provides access for multiple stations. A DAC connects directly to an FDDI ring using A and B ports.

SAS - (Single Attached Station) Station that accesses the primary ring only, via a concentrator.

SAC - (Single Attached Concentrator) Station that accesses the primary ring only and provides access for multiple Single Attached Stations (SAS). Single Attached Concentrators provide the same services as DACs, but without the redundancy of the dual ring topology.

While Local Management updates the ring map, for example, during a ring topology change, the screen displays ??-??-??-??-??-?? to illustrate an undetermined address. You cannot use the scroll commands until Local Management finishes rebuilding the map.

The Ring Map display stops at the first occurrence of an undetermined address, and does not display any known information beyond this point.

3.7.2 Ring Map Configuration Screen Commands

The following list describes each of the Ring Map Configuration screen commands:

Address Mode [ ]
The Address Mode command allows the user to switch between canonical and MAC format addresses. To toggle between the two address modes, press the SPACE bar.

SCROLL DOWN *n*
The Scroll Down *n* command rotates the ring display, so that the station addresses shift around the ring in a clockwise direction. The *n* controls the number of shifts downstream of the DELHF-UA.

SCROLL UP *n*
The Scroll Up *n* command rotates the ring display, so that the station addresses shift around the ring in a counterclockwise direction. The *n* controls the number of shifts upstream of the DELHF-UA.

When the ring map contains only one station, the **SCROLL UP *n*** and **SCROLL DOWN *n*** commands do not appear.

3.7.2.1 Adjusting the Scroll Number (*n*)

When using the **SCROLL DOWN *n*** or **SCROLL UP *n*** commands, the *n* allows the user to control the number of shifts made with each command execution.

To set the number (*n*) of scrolls, perform the following steps:

1. Using the ARROW keys, highlight the **SCROLL DOWN *n*** or **SCROLL UP *n*** command.
2. Press the SHIFT and + keys (to increment) or the SHIFT and - keys (to decrement) until the number of shifts desired displays.
3. Press ENTER. The ring map scrolls *n* number of shifts.

The scroll number remains the same until it is changed manually, or the Local Management session is terminated.

3.7.3 The Node Information Screen

The Ring Map Node Information screen provides information for each selected node on the Ring Map Configuration screen.

The Ring Map Node Information screen reflects node status at the time the node was selected. The Node Information screen does not change dynamically with network topology changes.

To access the Node Information screen from the Ring Map Configuration screen, use the arrow keys to highlight any node (FDDI address) illustrated on the ring, and press ENTER. The Node Information screen, Figure 3-12, displays.

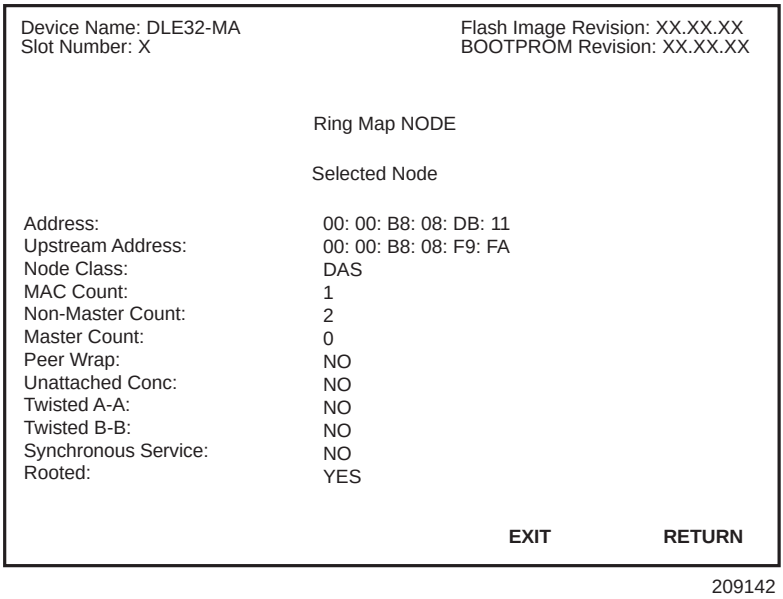


Figure 3-12 The Ring Map Node Information Screen

3.7.4 Node Information Screen Fields

The following list describes each of the Node Information screen fields:

Address
Displays the address of the selected node.

Upstream Address
Displays the address of the selected node's nearest active upstream neighbor (NAUN).

Node Class
Displays the class (NAS, DAS, DAC, SAS, or SAC) of the selected node. For an explanation of these class codes, refer to Section 3.7.1.

MAC Count
Displays the number of MACs (Media Access Controllers) that are physically housed in the selected node.

Non-Master Count
Displays the number of A and B ports on the selected node.

Master Count
Displays the number of M ports controlled by the selected node.

Peer Wrap
Indicates whether a wrap condition exists on a port. A peer wrap does not occur when the A or B port is attached to an M port.

Unattached Conc (DAC Only)
Indicates whether the selected node has no active A or B port.

Twisted A-A
Indicates whether the A port is connected to another A port.

Twisted B-B
Indicates whether the B port is connected to another B port.

Synchronous Service
Indicates whether the selected node uses synchronous bandwidth, which guarantees a certain percentage of the total FDDI bandwidth for real-time applications.

Rooted
Indicates whether the selected node has an active A or B port when one, and only one, end of the fiber link connects to an M port.

3.8 THE DELHF-UA CONFIGURATION SCREEN

To access the DELHF-UA Configuration screen from the DELHF-UA Setup screen, use the arrow keys to highlight the **DELHF-UA Configuration** menu item and press ENTER. The DELHF-UA Configuration screen, Figure 3-13, displays.

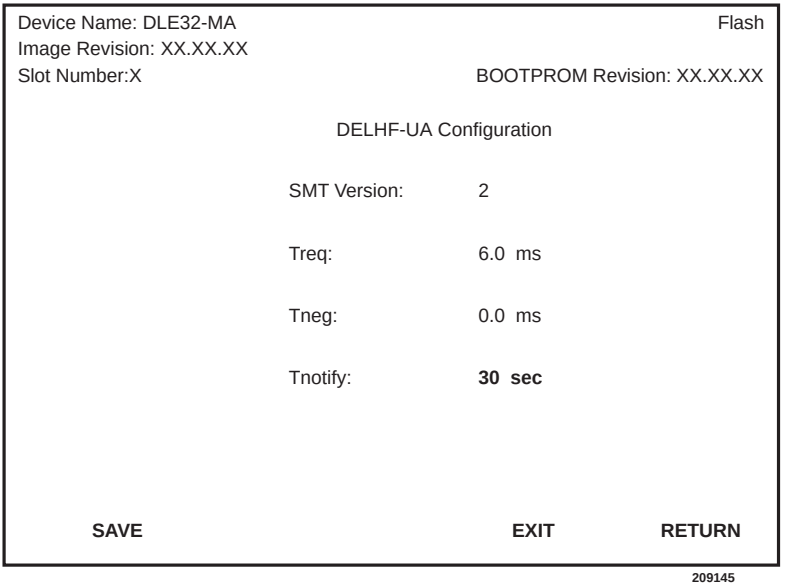


Figure 3-13 The DELHF-UA Configuration Screen

3.8.1 DELHF-UA Configuration Screen Fields

The following list describes each of the DELHF-UA Configuration screen fields:

SMT Version
This field displays the current version of Station Management (SMT) the DELHF-UA is using.

Treq
This field displays the Token Rotation Time (TRT) of the DELHF-UA.

Tneg
This field displays the negotiated token rotation time (in milliseconds) that the stations on the ring established through the token claiming process.

Tnotify
This field displays the interval (in seconds) at which the DELHF-UA transmits Neighbor Information Frames (NIFs). The DELHF-UA uses NIFs to periodically announce its address and basic station description. To change the DELHF-UA Tnotify period from the default thirty seconds, perform the following steps:

1. Use the arrow keys to highlight the **Tnotify** field.
2. Enter a value between 2 and 30.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

The DELHF-UA now sends NIFs at the new interval.

SAVE
This command saves all configuration changes to memory.

3.9 THE FULL DUPLEX CONFIGURATION SCREEN

To access the Full Duplex Configuration screen from the DELHF-UA Setup screen, use the arrow keys to highlight the **Full Duplex Configuration** menu item and press ENTER. The Full Duplex Configuration screen, Figure 3-14, displays.

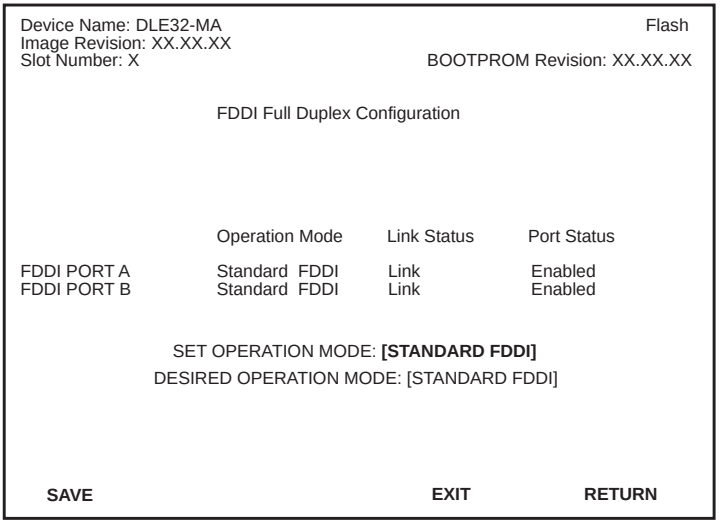


Figure 3-14 The FDDI Full Duplex Configuration Screen

To configure the DELHF-UA to operate in full duplex mode, two FPIMs MUST be installed in the DELHF-UA.

3.9.1 Full Duplex FDDI

Full duplex FDDI is the creation of a 200 Mbps point-to-point link between two FDDI devices that support full duplex FDDI operation. Full duplex FDDI is a technology where the end devices simultaneously transmit and receive data at 100 Mbps. For the DELHF-UA to operate in full duplex mode, specific criteria must be met. Before configuring the DELHF-UA to operate in full duplex mode, ensure that the network configuration meets the following requirements.

- The FDDI device that connects to the DELHF-UA must be a DIGITAL product that supports full duplex FDDI (e.g., another DELHF-UA).
- Full duplex FDDI is a point-to-point link between two devices that support full duplex operation. No other stations may be present on the ring. If a third station is added, the DELHF-UA automatically returns to standard FDDI operation.
- There must be two FPIMs installed in the DELHF-UA to connect to the other full duplex FDDI device. To operate in full duplex mode, one port transmits data while the other receives data simultaneously. DIGITAL recommends that the connection between the two devices be made from the A port of one device, to the B port of the other.

Making a connection between the A ports of both devices to the B ports of both devices (as is done with a DAS in normal FDDI operation) DOES NOT create a redundant path when using full duplex FDDI.

3.9.2 Full Duplex Configuration Screen Fields

The following list describes each of the Full Duplex Configuration screen fields:

Operation Mode
This is a read-only field that displays the current operating parameters of the port. This field reads “Standard FDDI” or “Full Duplex”.

Link Status
This is a read-only field that will display “Link” or “No Link”.

Port Status
This is a read-only field that will display “Enabled” or “Disabled”.

SET OPERATION MODE
This field toggles between [STANDARD FDDI] and [FULL DUPLEX]. To change the current selection, use the arrow keys to highlight the field and press the SPACE bar.

DESIRED OPERATION MODE
This read-only field displays the desired operation mode of the DELHF-UA. In some cases, the DELHF-UA will not begin operating in full duplex mode immediately. This field confirms that changes to the SET OPERATION MODE field have been saved, and the DELHF-UA is in the process of changing to the operation mode that is displayed in this field.

SAVE
This command saves all configuration changes to memory.

3.9.3 Configuring the DELHF-UA for Full Duplex Operation

To configure the DELHF-UA to operate in full duplex mode, complete the following steps.

1. Use the arrow keys to highlight the **[STANDARD FDDI]** field.
2. Use the SPACE bar to toggle between **[STANDARD FDDI]** and **[FULL DUPLEX]**.

[STANDARD FDDI] is the default setting for the **SET OPERATION MODE** field of the DELHF-UA.

3. With **[FULL DUPLEX]** selected, use the arrow keys to highlight the **SAVE** command at the bottom of the screen, then press ENTER. The "Saved OK" message displays indicating that the changes have been saved to memory.

When the **SAVE** command is executed, both ports of the DELHF-UA begin operating in full duplex mode.

3.10 THE FDDI/ETHERNET TRANSLATION CONFIGURATION SCREEN

To access the FDDI/Ethernet Translation Configuration screen from the DELHF-UA Setup screen, use the arrow keys to highlight the **FDDI/Ethernet Translation Configuration** menu item on the DELHF-UA Setup screen and press ENTER. The FDDI/Ethernet Translation Configuration screen, Figure 3-15, displays.

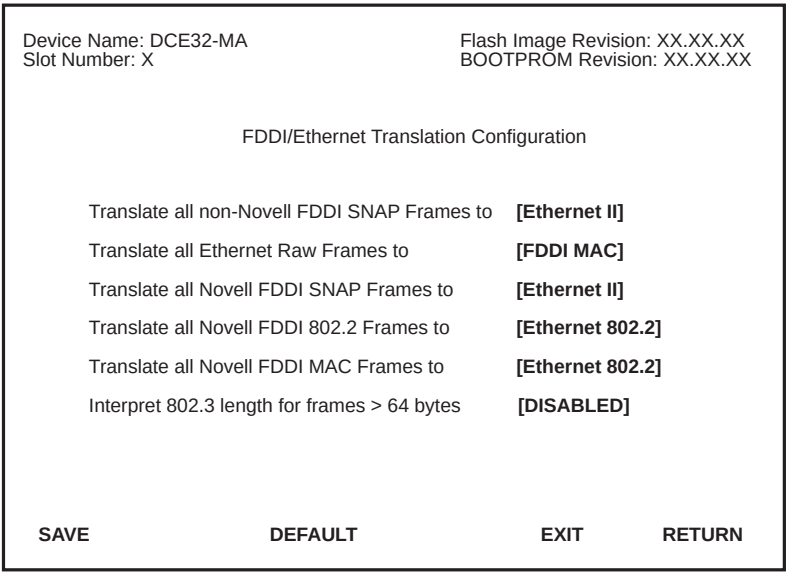


Figure 3-15 The FDDI/Ethernet Translation Configuration Screen

3.10.1 FDDI Translation Configuration Screen Fields

The following list describes each of the FDDI Translation Configuration screen fields:

Translate all non-Novell FDDI SNAP Frames to
This field allows the user to translate all non-Novell FDDI SNAP frames to a specific Ethernet frame type. The Ethernet frame types that are available are as follows:

- **Ethernet II**
- **Ethernet SNAP**

The default setting for the non-Novell FDDI SNAP field is **Ethernet II**.

Translate all Ethernet Raw Frames to
This field allows the user to translate all Ethernet Raw frames to a specific FDDI frame type. The FDDI frame types that are available are as follows:

- **FDDI MAC**
- **FDDI SNAP**
- **FDDI 802.2**

The default setting for the Ethernet Raw field is **FDDI MAC**.

Translate all Novell FDDI SNAP Frames to
This field allows the user to translate all Novell FDDI SNAP frames to a specific Ethernet frame type. The Ethernet frame types that are available are as follows:

- **Ethernet II**
- **Ethernet SNAP**
- **Ethernet 802.3**
- **Ethernet 802.2**

The default setting for the Novell FDDI SNAP field is **Ethernet II**.

Translate all Novell FDDI 802.2 Frames to
This field allows the user to translate all Novell FDDI 802.2 frames to a specific Ethernet frame type. The Ethernet frame types that are available are as follows:

- **Ethernet II**
- **Ethernet SNAP**
- **Ethernet 802.3**
- **Ethernet 802.2**

The default setting for the Novell FDDI 802.2 field is **Ethernet 802.2**.

Translate all Novell FDDI MAC Frames to
This field allows the user to translate all Novell FDDI MAC frames to a specific Ethernet frame type. The Ethernet frame types that are available are as follows:

- **Ethernet II**
- **Ethernet SNAP**
- **Ethernet 802.3**
- **Ethernet 802.2**

The default setting for the Novell FDDI MAC field is **Ethernet 802.2**.

The Interpret 802.3 Length for Frames > 64 Bytes
This field allows the user to enable the DELHF-UA to examine the length field of an 802.3 Ethernet frame to determine if the sending device has added padding to a frame that contains more than the Ethernet minimum of 64 bytes. If padding has been added, the DELHF-UA removes any padding before sending the frame onto the FDDI ring.

The DELHF-UA automatically checks for padding all Ethernet frames that are the minimum 64 bytes in length.

The Interpret 802.3 length for frames > 64 bytes field toggles between the following options:

- **[DISABLED]** (default setting)
- **[ENABLED]**

If you retain the default setting of **[DISABLED]**, the DELHF-UA only examines 802.3 frames that are the Ethernet minimum 64 bytes in length. This allows for optimal switching performance, as the DELHF-UA assumes all frames over 64 bytes in length contain no padding.

If this field is set to **[ENABLED]** the DELHF-UA examines ALL 802.3 frame length fields to determine whether any of the frames contain padding. In this setting, the DELHF-UA removes unnecessary padding from any 802.3 frame, regardless of the size. Refer to Section 3.10.4 for information on when to set this field to **[ENABLED]**. Section 3.10.5 describes how to perform this task.

SAVE
This command saves all configuration changes to memory.

DEFAULT
This command sets all translation types to their default values.

3.10.2 Setting Frame Translation Types

To change the frame translations from the default settings, perform the following steps:

1. Use the arrow keys to highlight the desired frame type field, located inside the brackets.
2. Use the SPACE bar to toggle between the available choices.
3. With the desired frame type selected, use the arrow keys to highlight the **SAVE** command at the bottom of the screen, then press ENTER. The "Saved OK" message appears indicating that the changes have been saved to memory.

3.10.3 Setting the Frame Translation Types to the Default Values

To return the frame translations to the default settings, perform the following steps:

1. Use the arrow keys to highlight the **DEFAULT** command at the bottom of the screen and press ENTER.
2. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER. The "Saved OK" message appears indicating that the changes have been saved to memory.

3.10.4 When to Set the Interpret 802.3 Length for Frames > 64 Bytes Field to [ENABLED]

In most network configurations, the default setting of **[DISABLED]** is appropriate. Some Ethernet devices, however, add padding to frames that are larger than the Ethernet minimum of 64 bytes. If network problems arise with the DELHF-UA switching frames that contain padding, this field may need to be set to **[ENABLED]**. If you are not sure what is causing the problem, contact your DIGITAL representative.

3.10.5 Setting the Interpret 802.3 Length Field to [ENABLED]

To enable the Interpret 802.3 length for frames > 64 bytes, perform the following steps:

1. Use the arrow keys to highlight the **Interpret 802.3 length for frames > 64 bytes** field.
2. Use the SPACE bar to toggle the choices until **[ENABLED]** displays.
3. Use the arrow keys to highlight the **SAVE** command located at the bottom of the screen.
4. Press ENTER. The configuration changes are saved to memory.

To disable the Interpret 802.3 length for frames > 64 bytes field, perform the steps above while using the SPACE bar to toggle the options until **[DISABLED]** displays.

CHAPTER 4

LANVIEW LEDs

4.1 USING THE LANVIEW LEDS

This chapter describes how to use the LANVIEW LEDs to monitor the DELHF-UA status and diagnose DELHF-UA problems. Figure 4-1 shows the location of the DELHF-UA LEDs.

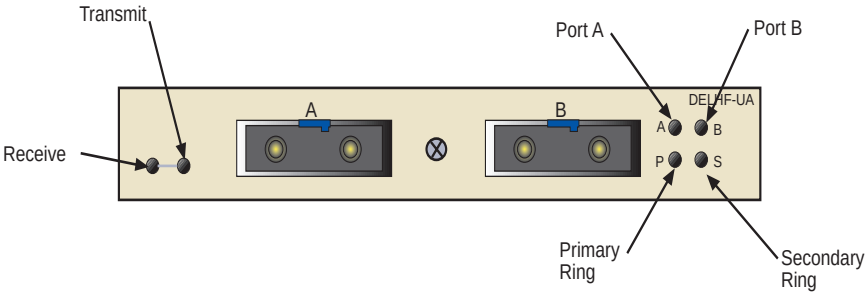


Figure 4-1 DELHF-UA LANVIEW LEDs

Table 4-1 DELHF-UA Transmit and Receive LEDs

LED	Color	Definition
Transmit	Green (Flashing) Amber (Flashing) Off	Transmitting Standby No activity
Receive	Amber Off	Receiving No activity

The following table describes the four possible states of the port A and port B LEDs of the DELHF-UA.

Table 4-2 Port A and Port B LED States and Definitions

Color	Definition
Green	Valid link to port and port enabled
Amber	Port disabled via management
Off	No valid link or no cable attached
Red	Possible hardware or FDDI ring failure

The A and B LEDs will sometimes flash red briefly while performing diagnostics. If they remain red for several minutes, however, it could indicate a hardware failure. If the LEDs remain red, contact your DIGITAL representative.

The following table defines the different conditions that the DELHF-UA can be in depending on the status (colors) of the A, B, P, and S LEDs respectively. Refer to Section 4.2 for more detailed definitions of the LED states.

If the DELHF-UA P and S LEDs remain red for several minutes the DELHF-UA could have a hardware problem. Contact your DIGITAL representative.

Table 4-3 A, B, P, S LED Definitions

A	B	P	S	Definition
Green	Green	Green	Off	Through-A
Green	Green	Off	Green	Through-B
Green	Off/Amber	Green	Amber	Wrap-A
Off/Amber	Green	Green	Amber	Wrap-B
Off	Green	Green	Amber	Dual Homed (Default)
Off	Green	Green	Off	Dual Homed (Modified)
Off/Amber	Off/Amber	Off	Off	Isolated
Green	Green	Amber	Amber	Twisted Ring (A-A, B-B)
Green	Off/Amber	Amber	Amber	Twisted Ring (A-A)/Wrap-A
Off/Amber	Green	Amber	Amber	Twisted Ring (B-B)/Wrap-B
Green	Green	Green	Green	Full Duplex
Green	Off	Green	Off	Wrap S (Port A)
Off	Green	Green	Off	Wrap S (Port B)

4.2 DELHF-UA LED STATE DEFINITIONS

- **Through-A** - The flow of the primary ring is entering the MAC from port A (primary ring in) and exiting through port B (primary ring out). The secondary ring is isolated from the MAC with the flow entering from port B (secondary ring in) and exiting through port A (secondary ring out).
- **Through-B** - The flow of the primary ring is entering the MAC from port B (primary ring in) and exiting through port A (primary ring out). The secondary ring is isolated from the MAC with the flow entering from port A (secondary ring in) and exiting through port B (secondary ring out).
- **Wrap-A** - The flow of the primary ring is entering through port A (primary in) and is wrapped by the DELHF-UA, causing the ring to exit through port A (secondary out). Port B is disconnected from the ring. If the DELHF-UA LED state indicates "Wrap-A" the ring has lost the redundancy of the secondary ring due to the wrapped condition. This configuration should be repaired, as additional problems could isolate stations from the FDDI ring.
- **Wrap-B** - The flow of the primary ring is entering through port B (secondary in) and is wrapped by the DELHF-UA, causing the ring to exit through port B (primary out). Port A is disconnected from the ring. If the DELHF-UA LED state indicates "Wrap-B" the ring has lost the redundancy of the secondary ring due to the wrapped condition. This configuration should be repaired, as additional problems could isolate stations from the FDDI ring.
- **Isolated** - Both port A and port B are isolated from the ring.
- **Dual Homed (Default)** - The flow of the primary ring is entering through port B (primary in) and is wrapped by the DELHF-UA, causing the ring to exit through port B (secondary out). Port A is in standby mode, and will take over the functions of port B if port B leaves the ring. This LED sequence is the default setting if the DELHF-UA is configured to be a dual homed device.

- **Dual Homed (Modified)** - The flow of the primary ring is entering through port B (primary in) and is wrapped by the DELHF-UA, causing the ring to exit through port B (secondary out). Port A is in standby mode, and will take over the functions of port B if port B leaves the ring. This dual homed LED sequence is set by setting the OID **ctsmtmibDualHomeWrpLEDStatus** to off.
- **Twisted Ring (A-A, B-B)** - This condition indicates that the A port of the DELHF-UA is connected to the A port of another device, and the B port of the DELHF-UA is connected to the B port of the other device. This is an undesirable ring condition and should be repaired as some stations could be isolated from the primary ring.
- **Twisted Ring (A-A)/Wrap-A** - This condition indicates that the A port of the DELHF-UA is connected to the A port of another device. It also indicates that the A port has wrapped, combining the primary and secondary rings into a single ring. This is an undesirable ring condition and should be repaired as some stations could be isolated from the primary ring.
- **Twisted Ring (B-B)/Wrap-B** - This condition indicates that the B port of the DELHF-UA is connected to the B port of another device. It also indicates that the B port has wrapped, combining the primary and secondary rings into a single ring. This is an undesirable ring condition and should be repaired as some stations could be isolated from the primary ring.
- **Full Duplex** - The DELHF-UA has been configured to operate in full duplex mode. For more information on full duplex mode for the DELHF-UA refer to Chapter 3, **Local Management**.
- **Wrap S (Port A)** - The DELHF-UA has only one FPIM installed. The FPIM is installed in port A.
- **Wrap S (Port B)** - The DELHF-UA has only one FPIM installed. The FPIM is installed in port B.

CHAPTER 5
SPECIFICATIONS

This chapter lists the operating specifications for the DELHF-UA. Cabletron Systems reserves the right to change these specifications at any time without notice.

5.1 FIBER OPTIC INTERFACE

Depending on the FPIM, interfaces have the following characteristics:

5.1.1 Multimode Specifications

Table 5-1 Multimode Transmitter Specifications

Multimode Transmitter	
Optical wavelength	1330 nm typical
Optical output	-20.0 dBm minimum -14.0 dBm maximum
Optical rise time	3.5 ns maximum
Optical fall time	3.5 ns maximum
Spectral width	140 nm typical
Supply current	150 mA maximum

Table 5-2 Multimode Receiver Specifications

Multimode Receiver	
Optical wavelength	1330 nm typical
Optical input (avg. sensitivity)	-31.0 dBm minimum -14.0 dBm maximum
Output rise time	3 ns maximum
Output fall time	3 ns maximum
Supply current	150 mA maximum

Table 5-3 Multimode Receiver (Signal Detect) Specifications

Multimode Receiver (Signal Detect)	
Assert power	-33.0 dBm typical -31.0 dBm maximum
Assert time	10 µs typical 100 µs maximum
Deassert power	-36.0 dBm typical -45.0 dBm minimum
Deassert time	10 µs typical 350 µs maximum
Hysteresis	1.5 dB minimum

5.1.2 Single Mode Specifications

Table 5-4 Single Mode Transmitter Specifications

Single Mode Transmitter	
Optical wavelength	1330 nm typical
Optical output	-20.0 dBm minimum -14.0 dBm maximum
Optical rise time	3.5 ns maximum
Optical fall time	3.5 ns maximum
Spectral width	150 nm maximum
Supply current	150 mA maximum

Table 5-5 Single Mode Receiver Specifications

Single Mode Receiver	
Optical wavelength	1330 nm typical
Optical input (avg. sensitivity)	-31.0 dBm minimum -14.0 dBm maximum
Output rise time	3 ns maximum
Output fall time	3 ns maximum
Supply current	115 mA maximum

Table 5-6 Single Mode Receiver (Signal Detect) Specifications

Single Mode Receiver (Signal Detect)	
Assert power	-33.0 dBm typical -31.0 dBm maximum
Assert time	10 µs typical 100 µs maximum
Deassert power	-36.0 dBm typical -45.0 dBm minimum
Deassert time	10 µs typical 350 µs maximum
Hysteresis	1.5 dB minimum

5.2 UNSHIELDED TWISTED PAIR (UTP) SPECIFICATIONS

Table 5-7 UTP Transmitter Specifications

UTP Transmitter	
Amplitude	1.080 Vpk maximum 0.920 Vpk minimum
Rise time	2 ns minimum 4 ns maximum
Fall time	2 ns minimum 4 ns maximum
Rise/Fall variation	0.5 ns maximum
Overshoot	5% maximum
Droop (14 symbols)	3% maximum

Table 5-8 UTP Receiver (Signal Detect)

UTP Receiver (Signal Detect)	
Assert time	10 µs typical 100 µs maximum
Deassert time	10 µs typical 350 µs maximum

5.3 SHIELDED TWISTED PAIR (STP) TRANSMITTER SPECIFICATIONS

Table 5-9 STP Transmitter Specifications

STP Transmitter	
Amplitude	1.285 Vpk maximum 1.165 Vpk minimum
Rise time	3 ns minimum 5 ns maximum
Fall time	3 ns minimum 5 ns maximum
Rise/Fall variation	0.5 ns maximum
Overshoot	5% maximum

Table 5-10 STP Receiver (Signal Detect) Specifications

STP Receiver (Signal Detect)	
Assert time	10 µs typical 100 µs maximum
Deassert time	10 µs typical 350 µs maximum

5.4 CABLE SPECIFICATIONS

The FDDI Physical Layer Medium Dependent (PMD), Twisted Pair Physical Layer Medium Dependent (TP-PMD), and Single Mode Fiber Physical Layer Medium Dependent (SMF-PMD) ANSI standards define cable requirements as follows:

Multimode Fiber

Core diameter:	62.5 µm nominal
Cladding diameter:	128.0 µm maximum 122.0 µm minimum
Cable attenuation:	ð 2.5 dB/km typical

Single Mode Fiber

Core diameter:	8.7 µm +/- 0.5 µm
Cladding diameter:	127.0 µm maximum
Cable attenuation:	ð 0.5 dB/km typical

5.4.1 Multimode Fiber Optic Cable Length

The PMD FDDI standard specifies the following:

Maximum total cable length:	100 km (62 miles) — dual ring 200 km (124 miles) — wrapped
Maximum multimode cable length between adjacent nodes:	2 km (1.2 miles)

5.4.2 Single Mode Fiber Optic Cable Length

The SMF-PMD FDDI standard specifies the following:

Maximum total cable length:	100 km (62 miles) — dual ring 200 km (124 miles) — wrapped
Single mode cable length between adjacent nodes:	40 km (24 miles) maximum 25 km (15 miles) typical

5.4.3 Twisted Pair Cable Length

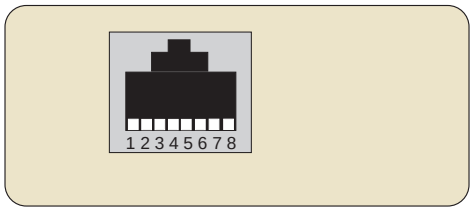
The TP-PMD FDDI standard specifies the following:

Maximum total cable length:	100 km (62 miles) — dual ring 200 km (124 miles) — wrapped
Maximum twisted pair cable length between adjacent nodes:	100 m (328.1 feet)

5.5 TWISTED PAIR PINOUT CONFIGURATION

This section provides the RJ45 pinout configuration for Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP) Physical Layer Medium Dependent (PMD) ports.

When connecting two twisted pair ports together, a transmit and receive cross-over must occur between the two devices (within the cable).



1. Transmit +
2. Transmit -
3. N/A
4. N/A
5. N/A
6. N/A
7. Receive +
8. Receive -

Figure 5-1 RJ45 TP-PMD Port

APPENDIX A
FPIM SPECIFICATIONS

This appendix describes the FDDI Port Interface Modules (FPIMs).

A.1 DEL00-UI AND DEL01-UI

The DEL00-UI and DEL01-UI, shown in Figure A-1, provide a multimode fiber connection. The DEL00-UI uses a MIC style connector and the DEL01-UI uses an SC type connector. The specifications for both devices are listed in Table A-1.

Table A-1 DEL00-UI and DEL01-UI Specifications

Parameter	Typical Value	Worst Case	Worst Case Budget	Typical Budget
Receive Sensitivity	-30.5 dBm	-28.0 dBm	NA	NA
Peak Input Power	-7.6 dBm	-8.2 dBm	NA	NA
50/125 µm fiber	-13.0 dBm	-15.0 dBm	13.0 dB	17.5 dB
62.5/125 µm fiber	-10.0 dBm	-12.0 dBm	16.0 dB	20.5 dB
100/140 µm fiber	-7.0 dBm	-9.0 dBm	19.0 dB	23.5 dB
Error Rate	Better than 10^{10}			

The link distance is up to 2 kilometers on the multimode fiber optic cable as specified by ANSI MMF-PMD.

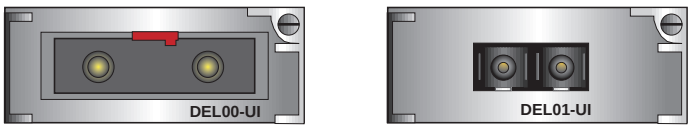
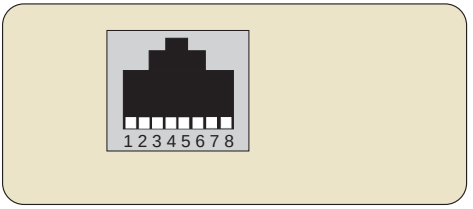


Figure A-1 The DEL00-UI and DEL01-UI

A.2 DEL02-UI

The DEL02-UI, shown in Figure A-3, has an RJ45 connector supporting an Unshielded Twisted Pair (UTP) connection. The pinouts are listed in Figure A-2.



1. Transmit +	5. N/A
2. Transmit -	6. N/A
3. N/A	7. Receive +
4. N/A	8. Receive -

Figure A-2 DEL02-UI Pinouts

The link distance is up to100 meters on unshielded twisted pair cable as specified by ANSI TP-PMD.

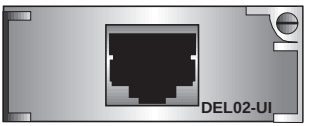


Figure A-3 The DEL02-UI

A.3 DEL05-UI

The DEL05-UI, shown in Figure A-4, provides a singlemode fiber connection. The DEL05-UI uses a MIC style connector. The specifications for this device are listed in Table A-2.

Table A-2 DEL05-UI Specifications

Parameter	Typical Value	Minimum	Maximum
Transmitter Peak Wave Length	1300 nm	1270 nm	1330 nm
Spectral Width	60 nm	-	100 nm
Rise Time	3.0 ns	2.7 ns	5.0 ns
Fall Time	2.5 ns	2.2 ns	5.0 ns
Duty Cycle	50.1%	49.6%	50.7%
Bit Error Rate	Better than 10^{10}		

The link distance is up to 40 kilometers (maximum) and 25 kilometers (typical) on single mode fiber-optic cable as specified by ANSI SMF-PMD.

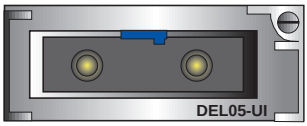


Figure A-4 The DEL05-UI

9032632 Printed in U.S.A.