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DIGITAL
MultiSwitch 700MD

DLEHF-MA Interface Module
User's Guide

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Part Number: 9032624

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This manual describes the MultiSwitch 700MD Interface Module and provides information concerning installation, troubleshooting, and the use of Local Management.

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 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.

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Achtung!

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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.

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CLASS 1 LASER TRANSCEIVERS

THE DELF3-UI FAST ETHERNET INTERFACE MODULE AND DEL05-UI FDDI PORT INTERFACE MODULE USE CLASS 1 LASER TRANSCEIVERS. READ THE FOLLOWING SAFETY INFORMATION BEFORE INSTALLING OR OPERATING THESE MODULES.

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 $8 \times 10^{3} \text{ W m}^{2}$ sr-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

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APPENDIX A   SPECIFICATIONS

PREFACE

Welcome to the *DIGITAL MultiSwitch 700MD DLEHF-MA Interface Module User's Guide*. This guide describes the DLEHF-MA Interface Module and provides information concerning installation, troubleshooting, and the use of Local Management.

USING THIS GUIDE

Read through this guide completely to understand the interface module features, capabilities, and Local Management functions.

> In this document, the DLEHF-MA is also referred to as either the "MultiSwitch 700MD" or "module."

STRUCTURE OF THIS GUIDE

This guide is organized as follows:

Chapter 1, **Introduction**, describes the features of the DLEHF-MA.

Chapter 2, **Network Requirements**, explains the network requirements to consider before installing the DLEHF-MA.

Chapter 3, **Installation**, provides instructions on how to install the module in the chassis and connect segments to the device.

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

Chapter 5, **Local Management**, describes how to access Local Management and use of the Local Management screens to manage the DLEHF-MA interface module and the DLM6C-AA chassis.

Appendix A, **Specifications**, contains information on functionality and operating specifications, connector pinouts, environmental requirements, and physical properties.

Appendix B, **DELTX-UI, DELFX-UI and DELF3-UI Specifications**, contains information about DELTX-UI pinouts and information concerning cable types used with the DELFX-UI and DELF3-UI.

Appendix C, **Optional Installations and Mode Switch Bank Settings**, describes how to install optional Fast Ethernet Interface Modules and how to set the Mode Switches.

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 personal injury or death due to an electrical hazard.

RELATED DOCUMENTATION

DIGITAL ATM Modular Interface DELHA-UA User's Guide
DIGITAL FDDI Modular Media Interface DELHF-UA User's Guide
DIGITAL WAN Modular Interface DELHW-UA User's Guide
DIGITAL MultiSwitch 700 DLM6C-AA Overview and Setup Guide
DIGITAL Port Based VLAN User's Guide
DIGITAL OPEN DECconnect Applications Guide or
Cabletron *Cabling Guide*

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.)

• 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	The DELF3-UI uses Class 1 lasers. 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.
	VORSICHT	Einige DELF3-UI benutzen Laser der Klasse 1. Zum Ansehen der Laserausgabe dürfen keine optischen Geräte benutzt werden, da dadurch das Risiko von Augenverletzungen erhöht wird. Vor dem Ansehen des optischen Ausgangsanschlusses muß der Netzwerkadapter vom Stromanschluß getrennt werden.

DANGER	Certains DELF3-UI utilisent des lasers de classe 1. Ne pas utiliser d'instruments optiques pour visualiser la sortie laser, car ces instruments augmentent les risques oculaires. Pour visualiser le port optique, débrancher l'adaptateur secteur.
AVISO	Ciertos DELF3-UI utilizan rayos láser de Clase 1. No utilice instrumentos ópticos para ver la salida láser. El uso de estos instrumentos para tal fin aumenta el peligro para la visión. Cuando mire al puerto óptico de salida, se debe eliminar la alimentación del adaptador de red.

CAUTION	The DLEHF-MA, and the host module are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could damage the Fast Ethernet Interface Module or the host.
ACHTUNG	Das DLEHF-MA und das Hostsystemmodul sind für statische Entladungen empfindlich. Benutzen Sie deshalb ein Antistatikarmband, und beachten Sie während dieses Verfahrens alle diesbezüglichen Vorsichtsmaßnahmen. Bei Nichtbeachtung könnte das schnelle Ethernet-Schnittstellenmodul oder das Hostsystemmodul beschädigt werden.
ATTENTION	Le module DLEHF-MA et le module 'hôte' sont sensibles aux décharges statiques. Utilisez un bracelet antistatique et prenez toutes les précautions nécessaires durant la procédure. Dans le cas contraire, vous risquez d'endommager le module d'interface Fast Ethernet ou le module 'hôte'

PRECAUCIÓN	DLEHF-MA Module y el módulo host son sensibles a las descargas estáticas. Utilice una banda antiestática para el puño y observe todas las precauciones de estática durante este procedimiento. Si no lo hace, podría dañar Fast Ethernet Interface Module o el módulo host.
CAUTION	Failure to observe static safety precautions could cause damage to the DLEHF-MA. Follow static safety handling rules and properly wear the antistatic wrist strap provided with the DLM6C-AA chassis. Do not cut the non-conductive bag to remove the module. Damage could result from sharp objects contacting the board or components.
ACHTUNG	Eine Nichtbeachtung der Sicherheitsmaßnahmen hinsichtlich statischer Entladungen könnte Schäden am DLEHF-MA verursachen. Folgen Sie deshalb den Sicherheitsrichtlinien, und tragen Sie das mit dem DLM6C-AA-Gehäuse gelieferte Antistatikarmband. Benutzen Sie zum Öffnen der nicht-leitfähigen Plastikhülle, in dem sich das Modul befindet, keine scharfen Instrumente, da die Karte oder die Komponenten beschädigt werden könnten.
ATTENTION	Le non respect de consignes de sécurité relative à l'électricité statique peut contribuer à endommager le DLEHF-MA. Respectez ces consignes lors du transport et portez , comme il convient, le bracelet anti-statique fourni avec le chassis DLM6C-AA. Ne coupez pas le sac non-isolant, lorsque vous retirez le module. Vous risquez d'endommager la carte et les composants s'ils sont en contact avec des objets pointus.

PRECAUCIÓN	Si no se observan las precauciones de seguridad estática, se pueden dañar DLEHF-MA. Siga las reglas de transporte de seguridad estática y utilice de manera adecuada la banda antiestática para la muñeca que se proporciona con el chasis DLM6C-AA. No corte la bolsa no conductora para retirar el módulo. La placa o los componentes podrían dañarse si hay un contacto con objetos agudos.
CAUTION	To prevent damaging the backplane connectors in the following step, take care that the module slides in straight and properly engages the backplane connectors.
ACHTUNG	Um die Anschlüsse an der Rückseite bei diesem Schritt nicht zu beschädigen, stellen Sie sicher, daß das Modul gerade eingeschoben und vorsichtig eingesetzt wird.
ATTENTION	Pour éviter d'endommager les connecteurs du « backplane » lors de l'étape suivante, veillez à ce que le module glisse tout droit et s'adapte correctement aux connecteurs du « backplane ».
PRECAUCIÓN	Para evitar dañar los conectores del plano posterior en el paso siguiente, verifique que el módulo se deslice derecho y se adapte correctamente a los conectores del plano posterior.
CAUTION	Do not touch the ends of the fiber optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of the ends causes problems in data transmissions. If the ends become contaminated, blow the surfaces with a canned duster. A fiber port cleaning swab saturated with optical-grade isopropyl alcohol may also be used to clean the ends.

ACHTUNG	Das Ende an beiden Seiten des Glasfaserkabels darf nicht berührt werden oder mit Staub, Schmutz und anderen Stoffen in Berührung kommen, die zur Verunreinigung führen und Datenübertragungsprobleme verursachen könnten. In einem solchen Fall müssen die Enden mit einem eigens dazu bestimmten Staubreiniger (z.B. einem speziellen Staubspray oder einem in Isopropylalkohol getauchten Wattestäbchen) sorgfältig gereinigt werden.
ATTENTION	Evitez de toucher les extrémités des fils en fibre optique et assurez-vous que ceux-ci n'entrent pas en contact avec de la poussière, de la saleté ou autres agents contaminants, pouvant provoquer des erreurs de transmission de données. Si les extrémités sont sales, nettoyez-les à l'aide d'un chiffon. Un tampon de nettoyage de port optique imbibé d'alcool isopropylique peut également être utilisé.
PRECAUCIÓN	No toque los extremos de los filamentos de la fibra óptica, ni permita que dichos extremos entren en contacto con polvo, suciedad u otros contaminantes. La contaminación de los extremos origina problemas en la transmisión de los datos. Si los extremos se contaminan, limpie su superficie con un plumero hermético. Un cepillo especial de limpieza para puertos de fibra óptica con alcohol isopropílico de calidad óptica también puede resultar útil para limpiar los extremos.
CAUTION	Pressing the RESET button resets the device and all current switching being performed by the device halts. The device will be unavailable for up to two minutes during the reset process.
ACHTUNG	Wenn der RESET-Knopf gedrückt wird, wird das Gerät zurückgestellt und alle vom Gerät derzeit ausgeführten Schaltungen werden gestoppt. Das Gerät ist anschließend für bis zu zwei Minuten nicht betriebsbereit.

ATTENTION	L'appui sur le bouton RESET réinitialise l'appareil, provoquant l'arrêt des commutations en cours. L'appareil sera indisponible pendant deux minutes maximum.
PRECAUCIÓN	Al pulsar el botón RESET se reinicia el dispositivo y se detienen todas las conmutaciones que en ese momento esté realizando. El dispositivo no estará disponible durante un máximo de dos minutos mientras dura el proceso de reinicio.
CAUTION	Before altering the COM port settings, ensure that a valid IP address is set for the module or chassis. (Refer to Section 5.15.1.) Read this entire COM port configuration section before changing the settings of the COM port.
ACHTUNG	Bevor Sie die Einstellungen des COM-Ports ändern, stellen Sie sicher, daß für das Modul oder das Gehäuse eine gültige IP-Adresse eingestellt ist. Lesen Sie den gesamten Abschnitt zur COM-Port-Konfiguration, bevor Sie die Einstellungen des COM-Ports ändern.
ATTENTION	Avant de modifier les paramètres du port COM, assurez-vous qu'une adresse IP valable a été attribuée au module ou au châssis. Lisez entièrement la section consacrée à la configuration du port COM avant de modifier ses paramètres.
PRECAUCIÓN	Antes de cambiar los parámetros del puerto COM, asegúrese de haber definido una dirección de IP válida para el módulo y/o el chasis. Lea la sección sobre configuración de puertos COM en su totalidad antes de cambiar ningún parámetro de un puerto de este tipo

| CAUTION | Before setting the operational mode, ensure that the items contained in this caution are fully understood.

The Management Mode of the module will automatically be set to STAND ALONE. The Management Mode field will no longer display on the General Configuration screen, and the module will no longer support Chassis configuration and Module selection screens.

The module has been assigned SNMP community names from the module SNMP Community Names screen. In Standalone management mode, the module does not use the community names of the DLM6C-AA chassis. |
|---|---|
| ACHTUNG | Bevor Sie den Betriebsmodus einstellen, müssen Sie diese Vorsichtshinweise vollständig verstanden haben.

Der Management-Modus des Moduls wird automatisch auf STAND ALONE gesetzt. Das Feld Management-Modus wird nicht mehr auf dem Bildschirm General Configuration (Allgemeine Konfiguration) angezeigt, und das Modul unterstützt keine Gehäusekonfiguration und keine Modulauswahlbildschirme mehr.

Das Modul hat auf dem Bildschirm SNMP Community Names einen SNMP-Community-Namen zugewiesen bekommen. Im Management-Modul Standalone verwendet das Modul die Community-Namen des DLM6C-AA-Gehäuses nicht. |

ATTENTION	Avant de paramétrer le mode opérationnel, lisez avec attention ce qui suit. Le mode de gestion du module sera réglé automatiquement sur STAND ALONE. Le champ Mode de gestion (Management Mode) ne s'affichera plus sur l'écran de configuration générale (General Configuration) et le module ne supportera plus la configuration de châssis et les écrans de sélection de module (Chassis configuration et Module selection). Il a été attribué des noms de communauté SNMP à parti de l'écran correspondant (SNMP Community Names). En mode de gestion autonome (Standalone), le module n'utilise pas les noms de communauté du châssis DLM6C-AA.
PRECAUCIÓN	Antes de definir el modo de funcionamiento, asegúrese de haber comprendido plenamente todos los puntos de esta nota de precaución. El modo de gestión (Management Mode) del módulo se definirá automáticamente como autónomo (STAND ALONE). El campo Management Mode ya no aparecerá en la pantalla de configuración general (General Configuration), y el módulo ya no soportará las pantallas de configuración del chasis (Chassis configuration) y selección de módulos (Module selection). El módulo deberá tener asignados nombres comunitarios SNMP de la pantalla de nombres comunitarios SNMP (SNMP Community Names). En el modo de gestión autónoma, el módulo no utiliza los nombres comunitarios del chasis del DLM6C-AA.

CAUTION	Do **NOT** disable or alter the settings of the COM port while operating the current Local Management (LM) connection through a terminal. Altering the COM port settings disconnects the LM terminal from the port, and ends the LM session. If the DLEHF-MA was previously assigned a valid IP address, reenter LM by establishing a Telnet connection to the device. If the device does not have a valid IP address and the COM port has been disabled or the settings changed, reset NVRAM on the DLEHF-MA (refer to AppendixC) to reestablish COM port communication.
ACHTUNG	Sie dürfen die COM-Port-Einstellungen **NICHT** abschalten oder ändern, während die aktuelle LM-Verbindung (Local Management) über ein Terminal besteht. Das Ändern der COM-Port-Einstellungen trennt das LM-Terminal vom Port und beendet die LM-Sitzung. Wenn dem DLEHF-MA zuvor eine gültige IP-Adresse zugewiesen wurde, gehen Sie wieder zu LM, indem Sie eine Telnet-Verbindung zum Gerät herstellen. Wenn das Gerät keine gültige IP-Adresse hat und der COM-Port abgeschaltet wurde oder wenn die Einstellungen geändert wurden, führen Sie einen NVRAM-Reset auf dem DLEHF-MA durch (siehe Anhang C), um die COM-Port-Kommunikation wiederherzustellen.
ATTENTION	**NE PAS** désactiver ou modifier les paramètres du port COM pendant la connexion Local Management (LM) via un terminal. La modification des paramètres du port COM entraîne la déconnexion du terminal LM de son port, et termine la session LM. Si une adresse IP valable a été attribuée à l'appareil DLEHF, repassez en LM en établissant une connexion Telnet. Si l'appareil ne dispose pas d'une adresse IP valable et que le port COM a été désactivé ou ses paramètres modifiés, réinitialisez la NVRAM sur le DLEHF-MA (voir Annexe C) pour rétablir la communication sur le port COM.

PRECAUCIÓN	**NO** desactive ni cambie los parámetros del puerto COM mientras esté operando la conexión actual de gestió local Local Management (LM) a través de un terminal. Si lo hace, se desconectará el terminal LM del puerto, y se terminará la sesión de LM. Si previamente se había asignado al DLEHF-MA una dirección de IP válida, vuelva a entrar en LM estableciendo una conexión Telnet con el dispositivo. Si el dispositivo no tiene una dirección de IP válida y el puerto COM se ha desactivado o se han cambiado sus parámetros, deberá reiniciar la memoria NVRAM del DLEHF-MA (consulte el Apéndice C) para restablecer las comunicaciones del puerto COM.
CAUTION	If the COM port is reconfigured without a valid IP address set on the module or chassis, the message shown in Figure 5-19 displays. Do not continue unless you fully understand the outcome of this action. If the Warning screen displays, continue on to step 4, otherwise, proceed to step 5.
ACHTUNG	Wenn der COM-Port rekonfiguriert wird, ohne daß auf dem Modul oder dem Gehäuse eine gültige IP-Adresse eingestellt ist, wird die in Abbildung 5-19 gezeigte Meldung angezeigt. Arbeiten Sie nicht weiter, bevor Sie die Auswirkungen dieser Aktion vollständig verstanden haben.
ATTENTION	Si le port COM est reconfiguré sans adresse IP valable pour le module ou le châssis, le message de la Figure 5-19 s'affiche. Ne continuez pas sans avoir bien compris les conséquences de votre action.
PRECAUCIÓN	Si se reconfigura el puerto COM sin haber definido una dirección de IP válida en el módulo o el chasis, aparecerá el mensaje mostrado en la Figura 5-19. No continúe a no ser que entienda perfectamente las consecuencias de esta acción.

CAUTION	Exiting without saving causes the message "NOT SAVED -- PRESS SAVE TO KEEP CHANGES" to display. Exiting without saving causes all edits to be lost.
ACHTUNG	Beenden ohne Speichern verursacht die Meldung "NOT SAVED -- PRESS SAVE TO KEEP CHANGES" (Nicht gespeichert - Drücken Sie Save/Speichern, um die Änderungen zu speichern). Durch Beenden ohne Speichern gehen alle durchgeführten Änderungen verloren.
ATTENTION	Si vous sortez sans enregistrer, le message "NOT SAVED - PRESS SAVE TO KEEP CHANGES" (Non enregistré - Appuyez sur SAVE pour conserver les modifications) s'affiche. Toutes vos modifications seront perdues.
PRECAUCIÓN	Si sale sin guardar, aparecerá el mensaje "NOT SAVED -- PRESS SAVE TO KEEP CHANGES" (NO SE HA GUARDADO - PULSE GUARDAR PARA CONSERVAR LOS CAMBIOS). Si sale sin guardar se perderán todos los cambios.
CAUTION	When the COM port is configured to perform the UPS application, all future Local Management connections must be made by establishing a Telnet connection to the module. Ensure that the module has a valid IP address before saving changes to the COM port application. If the module does not have a valid IP address and the changes are saved, refer to Appendix C for instructions on clearing NVRAM in order to reestablish COM port communications.

ACHTUNG	Wenn der COM-Port für die Ausführung der UPS-Anwendung konfiguriert ist, müssen alle zukünftigen Local-Management-Verbindungen durchgeführt werden, indem eine Telnet-Verbindung zum Modul aufgebaut wird. Stellen Sie sicher, daß das Modul eine gültige IP-Adresse hat, bevor Sie Änderungen in der COM-Port-Anwendung speichern. Wenn das Modul keine gültige IP-Adresse hat und die Änderungen gespeichert wurden, finden Sie im Anhang C Anleitungen zum Löschen des NVRAM, um die COM-Port-Kommunikationen wiederherzustellen.
ATTENTION	Lorsque le port COM est configuré pour une application UPS, toute future connexion Local Management doit se faire en établissant une connexion Telnet au module. Assurez-vous que celui-ci possède une adresse IP valable avant d'enregistrer les modifications apportées au port COM. Si le module n'est pas doté d'une adresse IP valable et que les modifications sont enregistrées, reportez-vous à l'Annexe C pour apprendre comment initialiser la NVRAM avant de rétablir des communications COM.
PRECAUCIÓN	Cuando el puerto COM está configurado para la aplicación UPS, todas las conexiones de gestión local (LM, Local Management) deberán realizarse estableciendo una conexión Telnet con el módulo. Asegúrese de que el módulo tiene una dirección de IP válida antes de guardar los cambios en la aplicación del puerto COM. Si el módulo no tiene una dirección de IP válida y se han guardado los cambios, consulte el Apendice C para obtener instrucciones sobre el borrado del contenido de la memoria NVRAM para restablecer las comunicaciones del puerto COM.
CAUTION	Clearing NVRAM will result in the loss of all user-entered parameters. Do not proceed unless you completely understand this procedure.

ACHTUNG	Das Löschen des NVRAM führt zum Verlust aller vom Benutzer eingegebenen Parameter. Arbeiten Sie nicht weiter, bevor Sie dieses Verfahren vollständig verstanden haben.
ATTENTION	Si vous réinitialisez la NVRAM, tous les paramètres utilisateur seront perdus. N'exécutez donc cette procédure qu'en parfaite connaissance de cause.
PRECAUCIÓN	El borrado del contenido de la memoria NVRAM provocará la pérdida de todos los parámetros introducidos por el usuario. No continúe a no ser que comprenda totalmente este procedimiento.
CAUTION	If the DLEHF-MA is being bridged to an FDDI ring IP Fragmentation should be enabled. If IP Fragmentation is disabled, all FDDI frames that exceed the maximum Ethernet frame size will be discarded.
ACHTUNG	Wenn DLEHF-MA per Bridge an einen FDDI-Ring angeschlossen werden sollte IP-Fragmentierung aktiviert werden. Wenn IP-Fragmentierung deaktiviert wird, werden alle FDDI-Frames, die die maximale Ethernet-Frame-Größe überschreiten, verworfen.
ATTENTION	Si les appareils DLEHF-MA sont reliés (pontage) sur un anneau FDDI, la fragmentation IP doit être active. Dans le cas contraire, toutes les frames FDDI dépassant la taille maximum des frames Ethernet seront ignorées.
PRECAUCIÓN	Si los DLEHF-MA se están puenteando a un anillo FDDI, la fragmentación de IP (IP Fragmentation) deberá estar activada. Si está desactivada todos los marcos FDDI que superen el tamaño máximo de marco de Ethernet se desecharán.
CAUTION	The Network Tools connection to the module will be terminated upon execution of this command.

ACHTUNG	Die Network Tools-Verbindung zum Modul wird bei der Ausführung dieses Befehls beendet.
ATTENTION	La connexion Network Tools au module cessera à l'exécution de cette commande.
PRECAUCIÓN	La conexión de Network Tools con el módulo se terminará al ejecutar este comando.
CAUTION	When installing a DELFX-UI or DELF3-UI module into the host module, remove the rubber plug on the SC connector before proceeding. Be sure to replace the plug once the installation is complete to keep dust/dirt out of the fiber.
ACHTUNG	Vor der Installation eines DELFX-UI- oder DELF3-UI-Moduls in das Hostsystemmodul muß der Gummistöpsel vom SC-Anschlußstecker entfernt werden.
ATTENTION	Lorsque vous installez un module DELFX-UI ou un module DELF3-UI, retirez la prise en caoutchouc placée sur le connecteur SC avant de procéder à l'installation.
PRECAUCIÓN	Al instalar un módulo DELFX-UI o DELF3-UI en el módulo de host, retire el enchufe de caucho del conector SC antes de continuar.
CAUTION	When inserting the Fast Ethernet Interface Module into the motherboard connector ensure that the pins do not bend, as this can damage both the Fast Ethernet Interface Module and the motherboard connector.
ACHTUNG	Beachten Sie, daß das schnelle Ethernet-Schnittstellenmodul gerade in die Hauptplatine eingesetzt wird und die Nadeln nicht gebogen werden. Wird es schräg eingesetzt, könnten sowohl das schnelle Ethernet-Schnittstellenmodul als auch die Hauptplatine beschädigt werden.

ATTENTION	Lorsque vous insérez le module d'interface Fast Ethernet dans le connecteur de de la carte mère, assurez-vous que les broches ne sont pas pliées, car vous risquez d'endommager à la fois le module et le connecteur.
PRECAUCIÓN	Al insertar Fast Ethernet Interface Module en el conector de la placa base, asegúrese de que las patillas no se doblen, ya que esto podría dañar tanto Fast Ethernet Interface Module, como el conector de la placa base.

CHAPTER 1

INTRODUCTION

1.1 DLEHF-MA OVERVIEW

The DLEHF-MA, shown in Figure 1-1, is an interface module for
DIGITAL DLM6C-AA MultiSwitch 700 chassis.

The DLEHF-MA is a high-speed network switch device that supports
IEEE 802.1D switching (bridging) and IEEE 802.1Q switching. Ports 1
and 2 of the DLEHF-MA support optional Fast Ethernet Interface
Modules and can provide uplinks to 100BASE-TX or 100BASE-FX Fast
Ethernet networks. The DLEHF-MA is capable of being equipped with
two High Speed Interface Modules (HSIMs) that provide for additional
connectivity to other high speed networking technologies such as
Asynchronous Transfer Mode (ATM), Wide Area Networks (WANs) and
Fiber Distributed Data Interface (FDDI).

Reset Button

COM Port

System
LED

CPU

HSIM Slots

Port Status
LEDs

Fast Ethernet
Interface Module
Ports 1 and 2
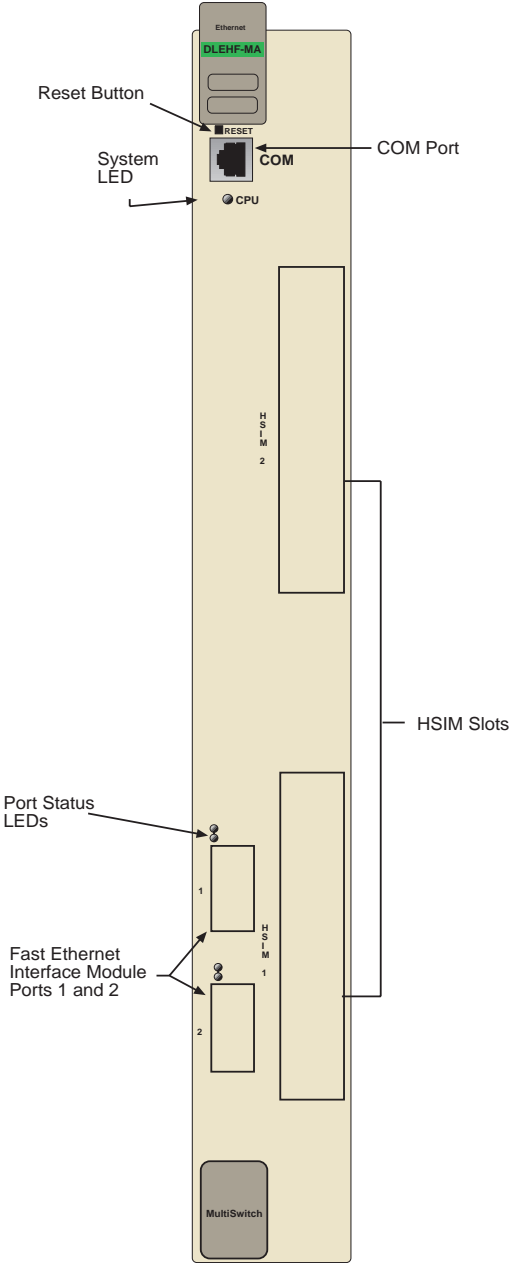
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Figure 1-1   The DLEHF-MA

1.1.1   Connectivity

The DLEHF-MA has two front panel slots (ports 1 and 2) for optional Fast Ethernet Interface Modules to support an uplink to 100 Mbps Ethernet backbones or a high speed connection to a local server.

The DLEHF-MA also has two front panel slots for optional High Speed Interface Modules to provide for additional connectivity to other high speed networking technologies such as ATM, WANs and FDDI.

1.1.2   Full Duplex Switched Ethernet

The optional Fast Ethernet Interface Modules can be configured to operate in Full Duplex Switched Ethernet mode, which provides 200 Mbps of throughput per interface.

1.1.3   Auto-Negotiation

The optional DELTX-UI Fast Ethernet Interface Module can auto-negotiate the type of connection required to provide a link to another device. During Auto-Negotiation, two devices automatically exchange information "telling" each other what their operating capabilities are. The Auto-Negotiation feature targets the maximum capabilities that can be reached between the two devices. For example, a DLEHF-MA DELTX-UI Fast Ethernet Interface Module adjusts to 100 Mbps when the device on the other end of the connection can also adjust between 10 or 100 Mbps. If the device on the other end of the connection can only operate at 10 Mbps, then the DLEHF-MA DELTX-UI Fast Ethernet Interface Module simply adjusts to 10 Mbps operation.

When Auto-Negotiation is supported at both ends of a link, the two devices dynamically adjust to full or half duplex operation based on the maximum capability that can be reached between the two devices. If the device connected to the DLEHF-MA cannot auto-negotiate, the DLEHF-MA Fast Ethernet Interface Module operates according to the capabilities of the other device.

1.1.4   Management

Management of the DLEHF-MA is accomplished using Local Management tools or remote SNMP management stations.

Local Management is accessible through the RS232 COM port on the front panel using a local VT100 terminal, or a remote VT100 terminal via a modem connection, and in-band via a Telnet connection. In-band remote management is possible through any SNMP compliant Network Management Software.

1.1.5   Switching Options

The DLEHF-MA provides IEEE 802.1D switching or IEEE 802.1Q switching between the two Fast Ethernet Interface Modules and High Speed Interface Modules (HSIMs).

THE 802.1Q switching option allows for migration to Virtual Network technologies without requiring the replacement of existing equipment.

1.1.6   Standards Compatibility

The DLEHF-MA is fully compliant with the IEEE 802.3 standard. The optional Fast Ethernet Interface Modules are fully compliant with the IEEE 802.3u standard. The DLEHF-MA provides IEEE 802.1D Spanning Tree Algorithm (STA) support to enhance the overall reliability of the network and protect against "loop" conditions. It also supports a wide variety of industry standard MIBs including RFC 1213 (MIB II), RFC 1271 (RMON), RFC 1317 (RS232 MIB), RFC 1493 (Bridge MIB), RFC 1354 (FIB MIB), and RFC 1573 (Evolution of MIB II Interfaces). A full suite of Cabletron Enterprise MIBs provide a wide array of statistical information to enhance troubleshooting.

1.1.7   Year 2000 Compliance

The DLEHF-MA has an internal clock that can maintain the current time and date beyond the year 1999.

1.1.8   LANVIEW Diagnostic LEDs

LANVIEW diagnostic LEDs serve as an important troubleshooting aid by providing an easy way to observe the status of individual ports and overall network operations. Chapter 4 provides details about the DLEHF-MA LANVIEW LEDs.

1.1.9   Runtime IP Address Discovery

This feature enables the DLEHF-MA to automatically accept an IP address from a BootP server on the network into NVRAM without requiring the user to enter an IP address through Local Management.

When the DLEHF-MA is connected to the network and powered up, Runtime IP Address Discovery (RAD) checks the DLEHF-MA for an IP address. If one has not yet been assigned, RAD checks to see if any of the DLEHF-MA interfaces has a link. If so, RAD sends out Reverse Address Resolution Protocol (RARP) and BootP requests to obtain an IP address from a BootP or RARP server on the network.

The RAD requests start out at an interval of 1 second and double after every transmission until an interval of 300 seconds is reached. At this point, the interval remains at 300 seconds. The RAD requests continue until an IP address is received from a BootP or RARP server, or an IP address is entered using Local Management.

1.2   LOCAL MANAGEMENT FEATURES

Local Management provides the tools that allow management of the DLEHF-MA, the Fast Ethernet Interface Modules, all HSIMs, and the DLM6C-AA chassis. Local Management for the DLEHF-MA provides the features detailed in Sections 1.4.1 through 1.4.6.

1.2.1   Distributed Chassis Management

From a management perspective, the DLM6C-AA MultiSwitch 700 chassis can be viewed as a single entity with a single IP address. Its management functions are distributed to all modules. This means a single module in the chassis, such as the DLEHF-MA, can be used to manage the entire chassis, and any other attached module through Local Management, SNMP, or Telnet applications.

1.2.2   Remote Monitoring (RMON)

The DLEHF-MA supports all Ethernet RMON groups, which include Statistics, Alarms, Events and History. These groups are enabled on all ports by default.

DIGITAL RMON Actions is a vendor specific extension of RMON and provides the ability to set an "Action" on any SNMP MIB variable. The Action can be triggered by any RMON Event and/or Alarm. An example of an Action would be to turn off a MIB-2 interface if a broadcast threshold is crossed.

1.2.3   Broadcast Suppression

Broadcast Suppression allows a user to set a desired limit of receive broadcast frames per port/per second to be forwarded out the other ports on the module up to the set limit. Any broadcast frames above this specified limit are dropped. In the event that broadcast frames are being suppressed, multicast and unicast frames continue to be switched.

1.2.4   Port Redirect Function

The port redirect function, also referred to as "Port Mirroring," is a troubleshooting tool used to map traffic from a single source port or multiple source ports to a destination port(s) within the chassis. This feature functions at the bit level, which allows all packets, including those with errors, to be copied and sent to an analyzer or RMON probe. The analyzer or RMON probe will see the data as if it is directly connected to the LAN segment of the source port(s).

1.2.5   SmartTrunk

The SmartTrunk feature allows the user to set a group of DLEHF-MA interfaces, so they can share the traffic load and effectively increase the bandwidth between connected DLEHF-MAs or other DIGITAL devices supporting the SmartTrunk feature.

For example, the two Fast Ethernet Interface Modules could be grouped to provide a 200 Mbps uplink in standard operation and a 400 Mbps uplink if set to operate in full duplex mode.

1.2.6   Additional Local Management Functions

Local Management also allows the following tasks to be performed:

*   Manage any module installed in the DLM6C-AA via a single terminal connection.

*   Assign an IP address and subnet mask to the DLEHF-MA module and DLM6C-AA chassis.

*   Select a default gateway.

*   Control local and remote access.

*   Designate workstations to receive SNMP traps from the DLEHF-MA module and DLM6C-AA chassis.

*   Configure module specific SNMP MIB objects including the IETF Bridge MIB objects.

Chapter 5 provides detailed information about Local Management of the DLEHF-MA, the optional Fast Ethernet Interface Modules and the DLM6C-AA chassis. The associated High Speed Interface Module user's guide provides detailed information about Local Management of the applicable HSIM.

1.3   OPTIONAL FEATURES

Options for the DLEHF-MA are Fast Ethernet Interface Modules and High Speed Interface Modules to add uplink capability.

DIGITAL provides Fast Ethernet Interface Modules for the DLEHF-MA to support uplinks to 100 Mbps Ethernet backbones or high speed connections to local servers. The Fast Ethernet Interface Modules are listed in Table 1-1.

Table 1-1   Fast Ethernet Interface Modules

P/N	Description	Application
DELTX-UI	Uses RJ45 connector	Supports Category 5 Unshielded Twisted Pair (UTP) cabling with an impedance between 85 and 111 ohms.
DELFX-UI	Uses SC connector	Supports multimode fiber optic cabling.
DELF3-UI	Uses SC connector	Supports single mode fiber optic cabling.

Other Fast Ethernet Interface Modules may be available for the DLEHF-MA. Check the Release Notes included with the DLEHF-MA.

DIGITAL provides High Speed Interface Modules for the DLEHF-MA to provide for additional connectivity to other high speed networking technologies such as ATM, WANs and FDDI. The HSIMs available for the DLEHF-MA are listed in the Release Notes.

CHAPTER 2

NETWORK REQUIREMENTS

Before installing the DLEHF-MA or a Fast Ethernet Interface Module, review the requirements and specifications referred to in this chapter.

The network installation must meet the guidelines to ensure satisfactory performance of this equipment. Failure to follow the guidelines may produce poor network performance.

> The Cabletron *Cabling Guide* and *DIGITAL OPEN DECconnect Applications Guide* referred to in the following sections, can be found at **http://www.networks.digital.com/**

2.1   SmartTrunk

To connect the DLEHF-MA to a network so it can take advantage of the SmartTrunk feature, there are certain rules concerning port connections and configurations that must be followed for proper operation. Section 5.19, describes SmartTrunking and provides the configuration rules.

2.2   100BASE-TX NETWORK

The DLEHF-MA, with a DELTX-UI installed in ports 1 or 2, provides an RJ45 connection that supports Category 5 UTP cabling. The device at the other end of the twisted pair segment must support IEEE 802.3u 100BASE-TX Fast Ethernet operations. The cabling between the devices must meet the test criteria for a 100BASE-TX link for the devices to operate at 100 Mbps. Refer to the Cabletron *Cabling Guide* or *DIGITAL OPEN DECconnect Applications Guide* for details.

> The DLEHF-MA with a DELTX-UI installed is capable of operating at either 10 or 100 Mbps. The DELTX-UI can automatically sense the speed of the other device and adjust its speed accordingly.

2.3   100BASE-FX FIBER OPTIC NETWORK

Ports 1 and 2 of the DLEHF-MA support the DIGITAL DELFX-UI and DELF3-UI fiber optic interface modules. The device at the other end of the fiber optic segment must support the 100BASE-FX Fast Ethernet operations. The cabling between the devices must meet the test criteria for a 100BASE-FX link for the devices to operate at 100 Mbps. Refer to the Cabletron *Cabling Guide* or *DIGITAL OPEN DECconnect Applications Guide* for details.

Multimode Mode Fiber Optic Cable

The test characteristics of a 100BASE-FX segment are covered in the Cabletron *Cabling Guide* or *DIGITAL OPEN DECconnect Applications Guide.*

Single Mode Fiber Cable

The test characteristics of a single mode fiber optic link are similar to those for a multimode fiber optic 100BASE-FX link, with the following exceptions:

• Cable type 8.3/125 μm

• Maximum Length - no more than 5 km from Data Terminal Equipment (DTE) to DTE in half duplex mode, or 20 km from DTE to DTE in full duplex mode.

CHAPTER 3

INSTALLATION

Only qualified personnel should install or service this unit.

This chapter covers the following items:

• Required tools

• Unpacking the DLEHF-MA

• Installing the DLEHF-MA into the DLM6C-AA chassis

• Connecting to the network

3.1   REQUIRED TOOLS

A Phillips screwdriver is required to install the Fast Ethernet Interface Modules in the DLEHF-MA.

3.2   UNPACKING THE DLEHF-MA

1. Open the box and remove the packing material protecting the module (do not remove the module from its non-conductive bag).

2. Verify the contents of the carton as listed in Table 3-1.

Table 3-1   Contents of DLEHF-MA Carton

Item	Quantity
DLEHF-MA	1
Manual Accessory Kit	1
Release Notes	1

3.3   DLEHF-MA OPTIONS

Install any optional equipment before proceeding to
Section 3.4.

If the DLEHF-MA is to be installed with an optional Fast Ethernet
Interface Module, refer to Appendix C for installation instructions. The
installation instructions for the HSIMs available for the DLEHF-MA are
located in the associated HSIM user's guide.

3.4   INSTALLING THE DLEHF-MA INTO THE DLM6C-AA CHASSIS

Failure to observe static safety precautions could cause
damage to the DLEHF-MA. Follow static safety handling rules
and properly wear the antistatic wrist strap provided with the
DLM6C-AA chassis.

Do not cut the non-conductive bag to remove the module.
Damage could result from sharp objects contacting the board
or components.

The DLEHF-MA can be installed in any of the 5 slots that are available.
To install the module, proceed as follows:

1.   Remove the blank panel covering the slot in which the module will be
     installed. All other slots must remain covered to ensure proper airflow
     and cooling. (Save the blank plate in the event you need to remove the
     module.)

2.   Carefully remove the module from the shipping box. (Save the box
     and packing materials in the event the module must be reshipped.)

3.   Locate the antistatic wrist strap shipped with the DLM6C-AA chassis.
     Attach the antistatic wrist strap to your wrist and plug the cable from
     the antistatic wrist strap into the ESD grounding receptacle at the
     upper right corner of the DLM6C-AA.

4. Remove the module from the plastic bag. (Save the bag in the event the module must be reshipped.)

5. Examine the module for damage. If any damage exists, DO NOT install the module. Immediately contact your DIGITAL representative.

> ⚠️ To prevent damaging the backplane connectors in the following step, take care that the module slides in straight and properly engages the backplane connectors.

> 📝 In the following step, ensure that the top plastic locking tab lines up with the desired slot number located on the front panel of the chassis. Refer to Figure 3-1.

6. Locate the slot guides that line up with the number of the slot in which the module will be installed. Install the module in the chassis by aligning the module circuit card between the upper and lower metal rail guides of the desired slot, sliding it into the chassis, and locking down the top and bottom plastic locking tabs, as shown in Figure 3-1.

Figure 3-1   Installing an Interface Module

DLEHF-MA User's Guide

3.5   CONNECTING TO THE NETWORK

This section provides the procedures for connecting fiber optic segments from the network or other devices to the modules.

If the DLEHF-MA is being installed in a network using SmartTrunking, there are rules concerning the network cable and port configurations that must be followed for SmartTrunking to operate properly. Before connecting the cables refer to Section 5.19, for the configuration information.

Ports 1 and 2 of the DLEHF-MA support DELTX-UI, DELFX-UI, or DELF3-UI Fast Ethernet Interface Modules. The DELTX-UI has an RJ45 connector for a twisted pair cable connection. The DELFX-UI has an SC style connector for a multimode fiber optic cable connection. The DELF3-UI has an SC style connector for a single mode fiber optic cable connection.

Refer to Section 3.5.1 to make a twisted pair connection to a DELTX-UI.

Refer to Section 3.5.2 to make a fiber optic connection to a DELFX-UI or a DELF3-UI.

3.5.1   Connecting a Twisted Pair Segment to the DELTX-UI

A DELTX-UI installed in port 1 and/or 2 has an internal crossover switch. If you need a crossover, set the Fast Ethernet Interface Module crossover switch shown in Figure 3-2 to the crossed over position marked with an **X**. If you do not need a crossover, set the Fast Ethernet Interface Module crossover switch shown in Figure 3-2 to the not crossed over position, marked with an =.

The DELTX-UI supports Category 5 UTP cabling with an impedance between 85 and 111 ohms only.

An odd number of crossovers (preferably one) must be maintained between like devices so that the transmit port of one device is connected to the receive port of the other device and vice versa.

Position =
(not crossed over)

Position X
(crossed over)

1. TX+ 5. NC
2. TX-   6. RX-
3. RX+ 7. NC
4. NC   8. NC

= ■ x

10
100

DELTX-UI

1. RX+ 5. NC
2. RX-   6. TX-
3. TX+ 7. NC
4. NC   8. NC

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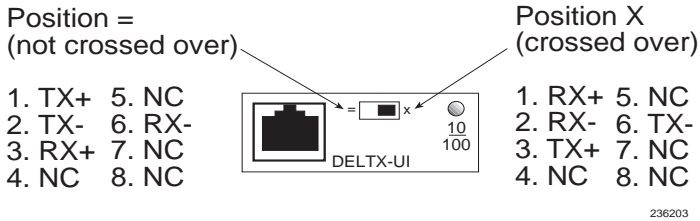
Figure 3-2   DELTX-UI Crossover Switch

Connect a DELTX-UI to a twisted pair segment as follows:

1. Ensure that the device connected to the other end of the segment is powered ON.

2. Connect the twisted pair segment to the module by inserting the RJ45 connector on the twisted pair segment into the RJ45 port on the module shown in Figure 3-2.

3. Verify that a link exists by checking that the port **RX** LED is on (flashing amber, blinking green, or solid green). If the **RX** LED is off, perform the following steps until it is on:

    a. Verify that the 100BASE-TX device at the other end of the twisted pair segment is powered up.

    b. Verify that the RJ45 connector on the twisted pair segment has the proper pinouts.

    c. Check the cable for continuity.

    d. Make sure that the twisted pair connection meets dB loss and cable specifications outlined in the Cabletron *Cabling Guide* or *DIGITAL OPEN DECconnect Applications Guide.*

    e. Confirm that the crossover switch is in the correct position.

If a link is not established, see Chapter 4, before contacting your DIGITAL representative.

3.5.2 Connecting a Fiber Optic Segment to the DELFX-UI and DELF3-UI

The DELFX-UI and DELF3-UI have an SC style network port (see Figure 3-3).

> An odd number of crossovers (preferably one) must be maintained between devices so that the transmit port of one device is connected to the receive port of the other device and vice versa.
>
> If the fiber optic cable being used has SC style connectors that do not resemble MIC style connectors, or has SC connectors on one end and a different type on the other, such as ST connectors, ensure that the proper crossing over occurs.

Fiber Optic Network Connection

1. Remove the protective rubber covers from the fiber optic ports on the applicable port on the module and from the ends of the connectors.

> The DELF3-UI uses Class 1 lasers. 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.

> Do not touch the ends of the fiber optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of the ends causes problems in data transmissions. If the ends become contaminated, blow the surfaces with a canned duster. A fiber port cleaning swab saturated with optical-grade isopropyl alcohol may also be used to clean the ends.

2. Insert one end of the SC connector into the DELFX-UI or the DELF3-UI installed in the DLEHF-MA. See Figure 3-3.

3. At the other end of the fiber optic cable, attach the SC connector to the other device.

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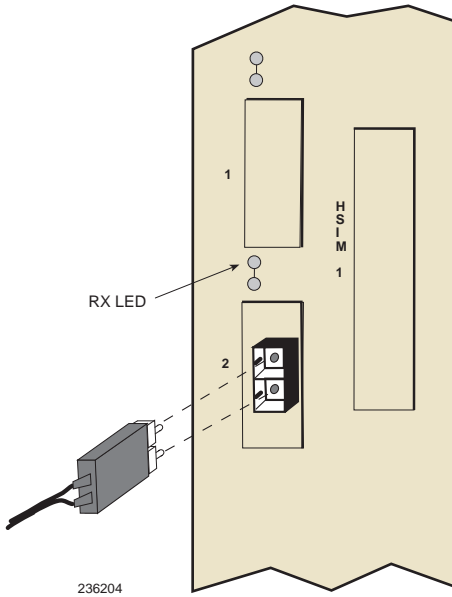
Figure 3-3   DELFX-UI and DELF3-UI Port Connection

4. Verify that a link exists by checking that the port **RX** LED is on (flashing amber, blinking green, or solid green). If the **RX** LED is off and the **TX** LED is not blinking amber, perform the following steps until it is on:

   a. Check that the power is turned on for the device at the other end of the fiber optic cable.

   b. Verify proper crossing over of fiber strands between the applicable port on the DLEHF-MA and the fiber optic device at the other end of the fiber optic cable.

   c. Verify that the fiber connection meets the dB loss specifications outlined in the Cabletron *Cabling Guide* or the *DIGITAL OPEN DECconnect Applications Guide*.

If a link is not established, see Chapter 4, before contacting your DIGITAL representative.

3.6   COMPLETING THE INSTALLATION

The DLEHF-MA is now ready to be set up through Local Management. Refer to Chapter 5 to configure the module and DLM6C-AA chassis.

CHAPTER 4

TROUBLESHOOTING

This chapter provides information concerning the following:

- Using the LANVIEW diagnostic and status monitoring system

- Troubleshooting network and module operational problems

- Using the RESET button

4.1   USING LANVIEW

The DLEHF-MA uses a built-in visual diagnostic and status monitoring system called LANVIEW. The LANVIEW LEDs (Figure 4-1) allow quick observation of the network status to aid in the diagnosing of network problems. Refer to Table 4-1 for a description of the LEDs.

For a functional description of the LANVIEW LED on the optional Fast Ethernet Interface Module (DELTX-UI), refer to Section 4.2.

All LEDs for the High Speed Interface Modules (HSIMs) are located on the HSIM and are described in the associated HSIM user's guide.
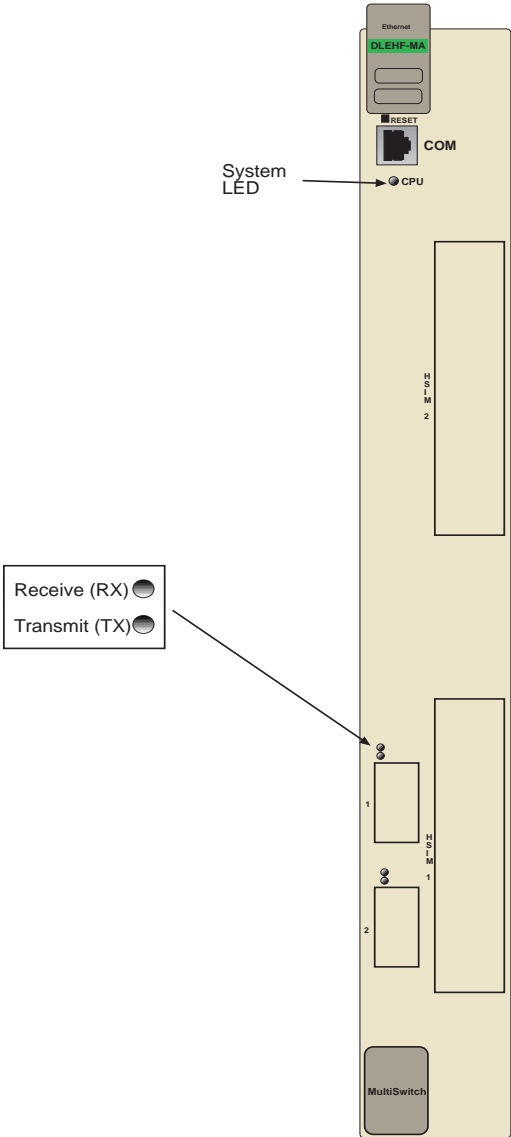
Figure 4-1   LANVIEW LEDs

The terms **flashing**, **blinking**, and **solid** used in the following tables indicate the following:

Flashing indicates an irregular LED pulse.

Blinking indicates a steady LED pulse. (50% on, 50% off)

Solid indicates a steady LED light. No pulsing.

Table 4-1   LANVIEW LEDs

LED	Color	State	Recommended Action
CPU	Off	Power off.	Power up chassis.
	Red	**Blinking**. Hardware failure has occurred.	Contact your DIGITAL representative.
		Solid. Resetting, normal power up reset.	None.
	Amber	**Blinking**. Crippled.	Contact your DIGITAL representative.
		Solid. Testing.	None.
	Green	**Solid**. Functional.	None.
	Amber and Green	Booting. Blinks amber and green while booting.	None.
RX	Off	No link. No activity. Port enabled or disabled.	None.
	Green	**Solid**. Port enabled, link, no activity.	None.
		Blinking. Port disabled, link.	None.
	Amber	**Flashing**. Port enabled, link, activity.	None.
	Red	Diagnostic failure.	Contact your DIGITAL representative.

Table 4-1   LANVIEW LEDs (Continued)

LED	Color	State	Recommended Action
TX	Off	Port enabled, and no activity.	1. Ensure that the STA is enabled and that there is valid link. 2. Contact your DIGITAL representative.
	Green	**Flashing**. Indicates activity. Rate indicates data rate.	None.
	Amber	**Blinking**. Port in standby, link.	1. Ensure that the port is not disabled. 2. Contact your DIGITAL representative for assistance.
	Red	**Flashing**. Indicates collision rate.	None, unless a high rate of collisions is occurring. If so, check network configuration.
		Solid. Diagnostic failure.	Contact your DIGITAL representative.

4.2   DELTX-UI LED

The optional DELTX-UI has one LED labeled 10/100. The 10/100 LED together with the receive LED allows the user to determine the link status and the operating speed of the Fast Ethernet Interface Module. The 10/100 LED and the Receive (RX) LED are shown in Figure 4-2. Table 4-2 and Table 4-3 provide a functional description of the DELTX-UI LED when the RX LED is on or off, respectively.
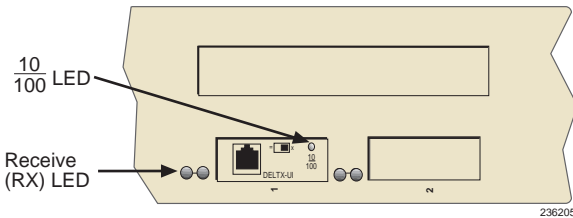
Figure 4-2   DELTX-UI LED

A link exists if the associated port (port 1 or 2) Receive (RX) LED is on.

Table 4-2   DELTX-UI LED Indications When the RX LED Is On

LED	Color	Description
10/100	Off	DELTX-UI is operating at 10 Mbps.
	Green	DELTX-UI is operating at 100 Mbps.

No link exists if the associated port (port 1 or 2) Receive (RX) LED is off.

Table 4-3   DELTX-UI LED Indications When the RX LED Is Off

LED	Color	Description
10/100	Off	No link or no cable attached. DELTX-UI forced to 10 Mbps operation, or is manually set to "auto-negotiate" mode.
	Green	No link or no cable attached. DELTX-UI is forced to 100 Mbps operation.

4.3   TROUBLESHOOTING CHECKLIST

If the DLEHF-MA is not working properly, refer to Table 4-4 for a checklist of possible problems, causes, and recommended actions to resolve the problem.

Table 4-4   Troubleshooting Checklist

Problem	Possible Cause	Recommended Action
All LEDs are OFF.	Loss of Power to the DLM6C-AA chassis.	Check the proper connection of the power cable and its access to a live outlet.
	The DLEHF-MA is not properly installed.	Check the installation.
No Local Management Password screen.	Autobaud enabled.	Press ENTER (RETURN) (may take up to four times).
	Terminal setup is not correct.	Refer to Chapter 5 for proper setup procedures.
	Improper console cable pinouts.	Refer to Appendix A for proper console port pinouts.
Cannot contact the DLEHF-MA from in-band management.	Improper Community Names Table.	Refer to Chapter 5 for Community Names Table setup.
	The DLEHF-MA does not have an IP address.	Refer to Chapter 5 for IP address assignment procedure.
	Port is disabled.	Enable port.
	No link to device.	Check link to device.
Port(s) goes into standby for no apparent reason.	The DLEHF-MA detects a looped condition.	1. Review network design and delete unnecessary loops. 2. Contact your DIGITAL representative if problem continues.
User parameters (IP address, Device and Module name, etc.) are lost when DLEHF-MA is powered down or the front panel RESET button is pressed.	Mode switch (7), NVRAM Reset, was changed sometime before either cycling power or pressing the RESET button, causing the user-entered parameters to reset to factory default settings.	1. Reenter the lost parameters as necessary. 2. Call your DIGITAL representative if problem continues.

4.4   USING THE RESET BUTTON

The RESET button located near the upper plastic locking tab of the module (refer to Figure 4-3) resets the DLEHF-MA processor without affecting the NVRAM.

> ⚠️ Pressing the RESET button resets the device and all current switching being performed by the device halts. The device will be unavailable for up to two minutes during the reset process.
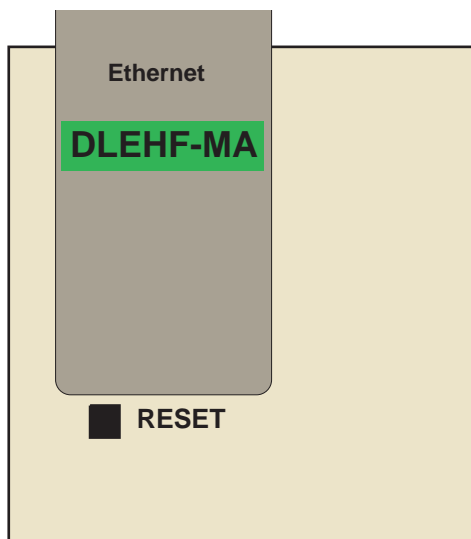
Figure 4-3   RESET Button

To reset the DLEHF-MA processor, use a pen or pencil to press and release the RESET button. The DLEHF-MA goes through the reset process and then reenters the network.

CHAPTER 5
LOCAL MANAGEMENT

This chapter explains how to set up a management terminal to access DLEHF-MA Local Management and how to use the Local Management screens and commands.

5.1   OVERVIEW

Local Management for the DLEHF-MA consists of a series of screens that allow for the management of the module, the attached segments and the DLM6C-AA chassis. The management screens allow the user to perform the following tasks:

- Manage any interface module in the chassis via a connection to a single interface module.

- Assign IP addresses and subnet masks to the DLEHF-MA, and assign an IP address to the DLM6C-AA chassis.

- Control access to the DLEHF-MA and the DLM6C-AA chassis by establishing community names.

- Download a new image of operating software.

- Designate which Network Management Workstations receive SNMP traps from the DLEHF-MA.

- Monitor the environmental status of the DLM6C-AA chassis.

- View switch, interface and RMON statistics.

- Assign ports to operate in standard or full duplex mode.

- SmartTrunking of ports to perform load sharing.

- Configure the Fast Ethernet Interface Modules and the HSIM(s) of the DLEHF-MA.

> If you have a DLEHW-UA installed in your DLEHF-MA, their Local Management screens can only be accessed via their respective ASYNC ports. See the associated HSIM user's guides for more details.

There are three ways to access Local Management:

- Locally using a VT type terminal connected to the COM port of the DLEHF-MA.

- Remotely using a VT type terminal connected through a modem.

- In-band through a Telnet connection.

5.2   LOCAL MANAGEMENT KEYBOARD CONVENTIONS

All key names appear as capital letters in this manual. Table 5-1 explains the keyboard conventions and the key functions that are used.

Table 5-1   Keyboard Conventions

Key	Function
ENTER Key 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.
ESCAPE (ESC) Key	This key allows an escape from a Local Management screen without saving changes. For example, "Press ESC twice" means the ESC key must be pressed quickly two times.
SPACE bar 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.
[–] Key	This key decreases values from a Local Management increment field. For example, "Press [–]" means to press the minus sign key.
DEL Key	The DEL (Delete) key removes characters from a Local Management field. For example, "Press DEL" means to press the Delete key.

5.3   MANAGEMENT TERMINAL SETUP

Use one of the following systems to access Local Management:

• An IBM or compatible PC running a VT series emulation software package

• A Digital Equipment Corporation VT100 type terminal

• A VT type terminal running emulation programs for the Digital Equipment Corporation VT100 series

• A remote VT100 type terminal via a modem connection

• In-band via a Telnet connection

5.3.1   Console Cable Connection

Use the Console Cable Kit provided with the DLM6C-AA chassis to attach the management terminal to the COM port as shown in Figure 5-1.

Connect an IBM PC or compatible device, running the VT terminal emulation, to the DLEHF-MA as follows:

1. Connect the RJ45 connector at one end of the cable (supplied in the kit) to the COM port on the DLEHF-MA.

2. Plug the RJ45 connector at the other end of the cable into the RJ45-to-DB9 adapter (supplied in the kit).

3. Connect the RJ45-to-DB9 adapter to the communications port on the PC.
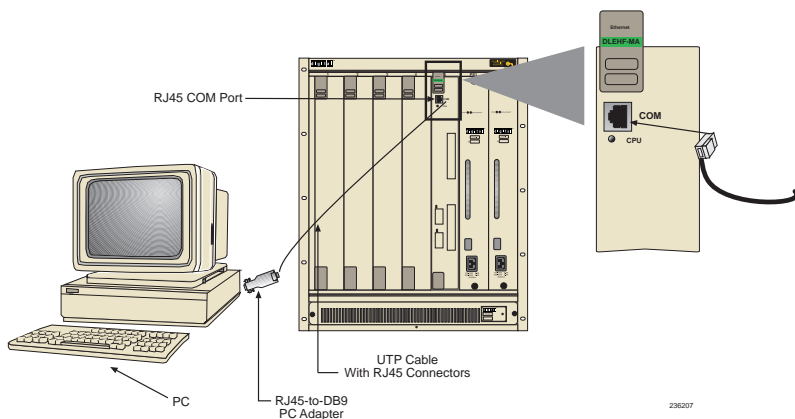
Figure 5-1   Management Terminal Connection

5.3.2   Management Terminal Setup Parameters

Table 5-2 lists the setup parameters for the local management terminal.

Table 5-2   VT Terminal Setup

Display Setup Menu	
Columns ->	80 Columns
Controls ->	Interpret Controls
Auto Wrap ->	No Auto Wrap
Scroll ->	Jump Scroll
Text Cursor ->	Cursor
Cursor Style ->	Underline Cursor Style
General Setup Menu	
Mode ->	VT100, 7 Bit Controls
ID number ->	VT100ID
Cursor Keys ->	Normal Cursor Keys
Power Supply ->	UPSS DEC Supplemental
Communications Setup Menu	
Transmit ->	2400, 4800, 9600, 19200
Receive ->	Receive=Transmit
XOFF ->	XOFF at 64
Bits ->	8 bits
Parity ->	No Parity
Stop Bit ->	1 Stop Bit
Local Echo ->	No Local Echo
Port ->	DEC-423, Data Leads Only
Transmit ->	Limited Transmit
Auto Answerback ->	No Auto Answerback
Keyboard Setup Menu	
Keys ->	Typewriter Keys
Auto Repeat ->	any option
Keyclick ->	any option
Margin Bell ->	Margin Bell
Warning Bell ->	Warning Bell

5.3.3   Telnet Connections

Once the module or chassis has a valid IP address, the user can establish a Telnet session with Local Management from any TCP/IP based station on the network. Telnet connections to the DLEHF-MA require the passwords assigned at the SNMP Community Names screen of either the DLM6C-AA chassis or the module. For additional information about these passwords, refer to Section 5.8. Refer to the instructions included with the Telnet application for information about establishing a Telnet session.

5.3.4   Connecting an Uninterruptible Power Supply

If the DLEHF-MA is connected to an American Power Conversion (APC) Uninterruptible Power Supply (UPS) device for power, a connection from its COM port to the UPS allows monitoring of the UPS power status. The COM port must first be reconfigured to support the UPS connection using the General Configuration LM screen as described in Section 5.15.11. Refer to the UPS documentation for details on how to access the status information.

Use the Console Cable Kit provided with the DLM6C-AA chassis to attach the UPS to the module COM port as shown in Figure 5-2.

Connect the UPS device to the COM port of the DLEHF-MA as follows:

1. Connect the RJ45 connector at one end of the cable to the COM port on the DLEHF-MA.

2. Plug the RJ45 connector at the other end of the cable into the RJ45-to-DB9 male (UPS) adapter, Cabletron Systems Part No. 9372066.

3. Connect the RJ45-to-DB9 male (UPS) adapter to the female DB9 port on the rear of the UPS device (refer to the particular UPS device's user instructions for more specific information about the monitoring connection).

RJ45 COM Port

DB9 Port

COM

CPU

UPS Device

UTP Cable
With RJ45 Connectors

RJ45-to-DB9
UPS Adapter

236208
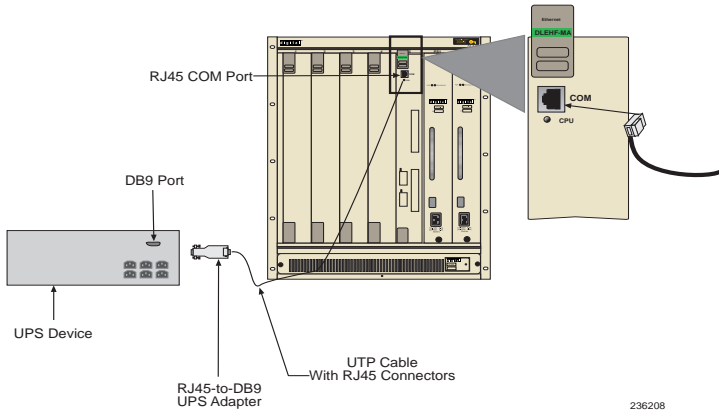
Figure 5-2   Uninterruptible Power Supply (UPS)

5.4   ACCESSING LOCAL MANAGEMENT

Access to Local Management is controlled through the Password screen, Figure 5-3. Whenever a connection is made to the DLEHF-MA the Password screen displays. Before continuing, the user must enter a password which is compared to the previously stored passwords. The level of access allowed the user depends on the password. To set or change passwords refer to Section 5.8. The following steps describe the procedure to access Local Management.

1. Turn on the terminal. Press ENTER until the DLM6C-AA Local Management Password screen (this may take up to four times, because the COM port auto-senses the baud rate of the terminal), Figure 5-3, displays.

MS 700 LOCAL MANAGEMENT

Enter Password:

Event Message Line
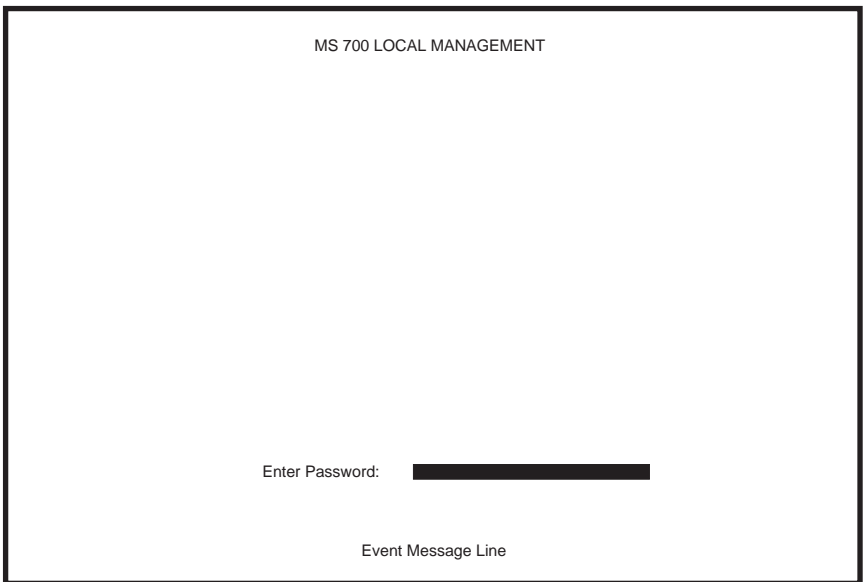
236209

Figure 5-3   Local Management Password Screen

2. Enter the Password and press ENTER. The default super-user access password is "*public*" or press ENTER.

> The user's password is one of the community names specified in the SNMP Community Names screen. Access to certain Local Management capabilities depends on the degree of access accorded that community name. Refer to Section 5.8.

- If an invalid password is entered, the terminal beeps and the cursor returns to the beginning of the password entry field.

- Entering a valid password causes the associated access level to display at the bottom of the screen and the Main Menu screen to display.

- If no activity occurs for several minutes, the Password screen redisplays and the session ends.

5.4.1   Navigating Local Management Screens

The DLEHF-MA Local Management application consists of a series of menu screens. Navigate through Local Management by selecting items from the menu screens.

The DLEHF-MA supports three modes of switch operation. The switching modes are as follows:

- 802.1D SWITCHING (IEEE 802.1D switching)

- 802.1Q SWITCHING (802.1Q port based VLANs)

> Refer to the Release Notes shipped with the product to verify which screens are supported in each of the two available switching modes.

The switch operational mode may be set in either the Chassis Configuration screen (Section 5.7), or the General Configuration screen of the module (Section 5.15). Depending on the Operational Mode set for the module, the hierarchy of Local Management screens differs as shown in Figure 5-4 and Figure 5-5. Refer to the appropriate figure that relates to the Operational Mode that will be set for the module to see the applicable Local Management screen hierarchy.
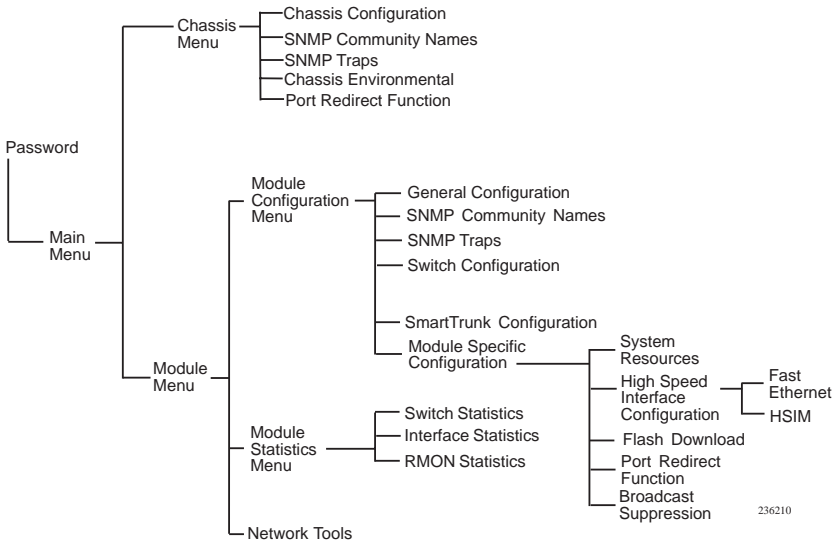
Figure 5-4   802.1D Switching Mode, LM Screen Hierarchy
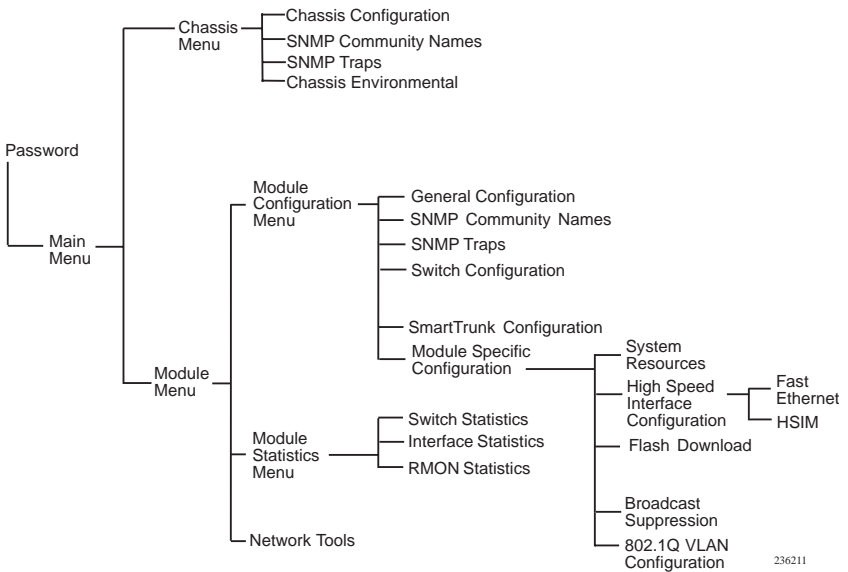
Figure 5-5   802.1Q Switching Mode, LM Screen Hierarchy

5.4.2   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.

5.4.3   Exiting Local Management Screens

There are two ways to exit Local Management (LM).

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

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

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 DLEHF-MA Local Management by repeating steps 1 and 2
    until the Main Menu screen displays.

4. Use the arrow keys to highlight the **RETURN** or **EXIT** command at the
    bottom of the Main Menu screen.

5. Press ENTER. The Password screen displays and the session ends.

5.5   THE MAIN MENU SCREEN

The Main Menu screen is the access point for all Local Management screens for the module and the DLM6C-AA chassis. Figure 5-6 shows the Main Menu screen.
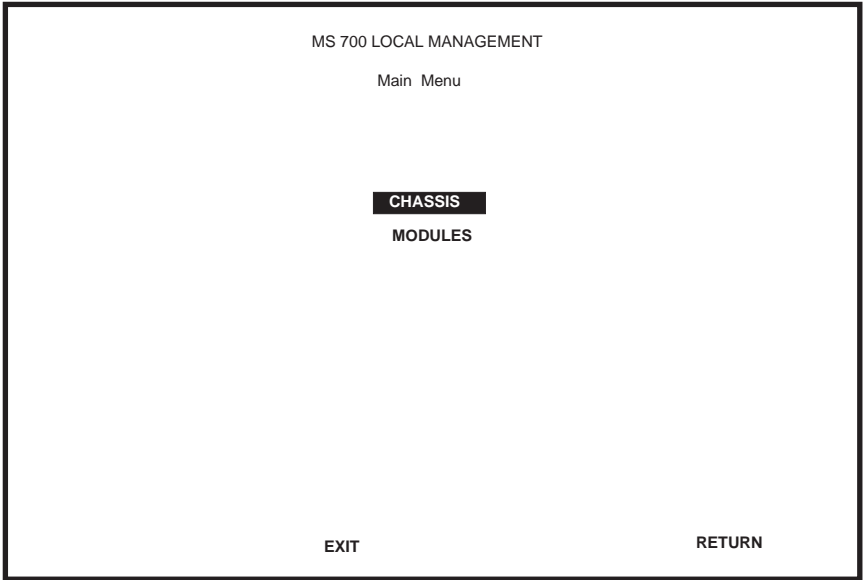
```
                    MS 700 LOCAL MANAGEMENT

                         Main  Menu




                         ┌──────────┐
                         │ CHASSIS  │
                         └──────────┘
                           MODULES








            EXIT                              RETURN

```
                                                        236213

Figure 5-6   Main Menu Screen

The following explains each Main Menu screen item as shown in Figure 5-6:

CHASSIS

The Chassis menu item provides access to the Chassis Menu screen, shown in Figure 5-7, that is used to configure the DLM6C-AA chassis, and to access current chassis power supply and environmental status.

To access the Chassis Menu screen, use the arrow keys to highlight the **CHASSIS** menu item and press ENTER. The Chassis Menu screen displays. For details about the Chassis Menu screen, refer to Section 5.6.

MODULES

The Modules menu item provides access to the Module Selection screen that is used to select individual modules in the chassis for management purposes.

To access the Module Selection screen, use the arrow keys to highlight the **MODULES** menu item and press ENTER. The Module Selection screen displays. For details about the Module Selection screen, refer to Section 5.12.

5.6   CHASSIS MENU SCREEN

The Chassis Menu screen, Figure 5-7, provides access to Local Management screens that allow you to configure and monitor operating parameters, modify SNMP community names, set SNMP traps, monitor the DLM6C-AA environmental status, and to perform port redirect functions.

```
                    MS 700 LOCAL MANAGEMENT

                         Chassis  Menu




           ┌──────────────────────────────────┐
           │  CHASSIS CONFIGURATION           │
           └──────────────────────────────────┘
             SNMP COMMUNITY NAMES

             SNMP TRAPS

             CHASSIS ENVIRONMENTAL

             PORT REDIRECT FUNCTION






                    EXIT                 RETURN
```
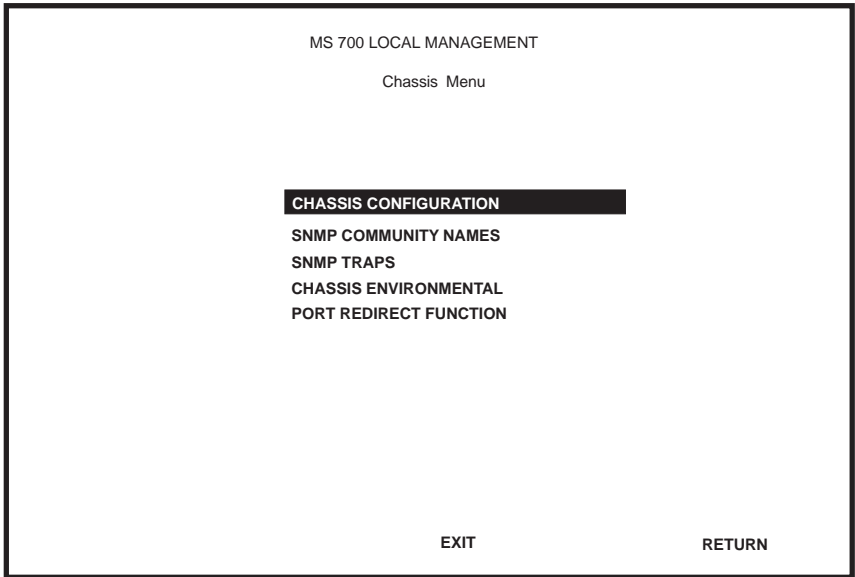
236214

Figure 5-7   Chassis Menu Screen

The following briefly explains each screen accessible from the Chassis
Menu Configuration screen:

CHASSIS CONFIGURATION
The Chassis Configuration screen allows the user to configure operating
parameters for the DLM6C-AA chassis. For details, refer to Section 5.7.

SNMP COMMUNITY NAMES
The SNMP Community Names screen allows the user to enter new,
change, or review the community names used as access passwords for
device management operation. Access is limited based on the password
level of the user. For details, refer to Section 5.8.

SNMP TRAPS

The SNMP Traps screen provides display and configuration access to the table of IP addresses used for trap destinations and associated community names. For details, refer to Section 5.9.

CHASSIS ENVIRONMENTAL

The Chassis Environmental screen provides access to chassis power supply status, power supply redundancy status and chassis fan tray status. For details, refer to Section 5.10.

PORT REDIRECT FUNCTION

The Port Redirect Function screen allows the user to redirect traffic from one or multiple modules and ports in the chassis to a specific destination module or port. For details, refer to Section 5.11.

5.7   CHASSIS CONFIGURATION SCREEN

The Chassis Configuration screen, Figure 5-8, allows the user to set the chassis date and time, IP address and Subnet Mask, the operational mode of all modules installed in the chassis, the screen refresh and lockout times, and to view the chassis uptime.

Access the Chassis Configuration screen from the Chassis Menu screen by using the arrow keys to highlight the **CHASSIS CONFIGURATION** menu item and pressing ENTER. The Chassis Configuration screen displays.

Figure 5-8   Chassis Configuration Screen

The following briefly explains each Chassis Configuration screen field:

MAC Address (Read-Only)
Displays the physical address of the chassis.

Chassis IP Address (Modifiable)
This field allows the IP address to be set for the DLM6C-AA chassis. If an IP address is assigned to the DLM6C-AA chassis all the interface modules installed in the chassis can be managed via this IP address, eliminating the need to assign an IP address to each interface module. To set the IP address, refer to Section 5.7.1.

Subnet Mask (Modifiable)

> Some firmware versions do not support the changing of the chassis subnet mask from the default value. Refer to the Release Notes to ensure that the Subnet Mask field is modifiable.

Displays the subnet mask for the chassis. A subnet mask "masks out" the network bits of the IP address by setting the bits in the mask to 1 when the network treats the corresponding bits in the IP address as part of the network or subnetwork address, or to 0 if the corresponding bit identifies

the host. The DLM6C-AA chassis automatically uses the default subnet mask that corresponds to the IP class that was entered in the IP field. Section 5.7.2 describes how to change the subnet mask from the default value.

Chassis Date (Modifiable)
Contains a value that the chassis recognizes as the current date. When the chassis date is modified and saved all interface modules installed in the chassis are set to this date. To set a new chassis date, refer to Section 5.7.3.

Chassis Time (Modifiable)
Contains a value that the chassis recognizes as the current time. When the chassis time is modified and saved, all interface modules installed in the chassis are set to this time. To enter a new time, refer to Section 5.7.4.

Screen Refresh Time (Modifiable)
Contains the rate at which the screens are updated. This setting determines how frequently (in seconds) information is updated on the screen. To enter a new update time, refer to Section 5.7.5.

Screen Lockout Time (Modifiable)
Contains the maximum number of minutes that the Local Management application displays a module's screen while awaiting input or action from a user. For example, if the number 5 is entered in this field, the user has up to five minutes to respond to each of the specified module's Local Management screens. In this example, after five minutes of "idleness" (no input or action), the terminal "beeps" five times, the Local Management application terminates the session, and the display returns to the Password screen. To enter a new lockout time, refer to Section 5.7.6.

Chassis Uptime (Read-Only)
Displays the total time the chassis has been operating. The chassis uptime is based on which interface module installed in the chassis has been operating for the longest period of time.

Operational Mode (Toggle)
This field allows the user to set all modules in the chassis to operate as an IEEE 802.1Q switch (802.1Q SWITCHING) or a traditional switch (802.1D SWITCHING). In 802.1D SWITCHING mode, the Fast Ethernet

Interface Modules and HSIMs are bridged to each other. When the operational mode is set to 802.1Q SWITCHING, the DLEHF-MA acts as an IEEE 802.1Q switch. The module is able to increase its switching functionality by creating and maintaining port based Virtual LANs (VLANs). To set the operational mode, refer to Section 5.7.7.

5.7.1   Setting the IP Address

To set the IP address, perform the following steps:

1. Use the arrow keys to highlight the **IP Address** field.

2. Enter the IP address into this field using Decimal Dotted Notation (DDN) format.

    For example: 134.141.79.120

3. Press ENTER. If the IP address is a valid format, the cursor returns to the beginning of the IP address field. If the entry is not valid, the Event Message Line displays "INVALID IP ADDRESS OR FORMAT ENTERED". Local Management does not alter the current value and refreshes the IP address field with the previous value.

4. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The "SAVED OK" message displays indicating that the changes have been saved to memory.

5.7.2   Setting the Subnet Mask

If the management workstation that is to receive SNMP traps from the DLM6C-AA is located on a separate subnet, the subnet mask for the DLM6C-AA must be changed from its default.

> Some firmware versions do not support the changing of the chassis subnet mask from the default value. Refer to the Release Notes to ensure that the Subnet Mask field is modifiable.

To change the subnet mask from its default, perform the following steps:

1. Use the arrow keys to highlight the **Subnet Mask** field.

2. Enter the subnet mask into this field using Decimal Dotted Notation (DDN) format.

   For example: 255.255.255.0

3. Press ENTER. If the subnet mask is valid, the cursor returns to the beginning of the Subnet Mask field. If the entry is not valid, the Event Message Line displays "INVALID SUBNET MASK OR FORMAT ENTERED". Local Management does not alter the current value, but it does refresh the Subnet Mask field with the previous value.

4. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The changes are saved to memory.

5.7.3   Setting the Chassis Date

The DLM6C-AA is year 2000 compliant, so the Chassis Date may be set beyond the year 1999. To set the chassis date, perform the following steps:

1. Use the arrow keys to highlight the **Chassis Date** field.

2. Enter the date this format: MM/DD/YYYY

> It is not necessary to add separators between month, day, and year numbers. For example, to set the date to 03/17/1997, type "03171997" in the Chassis Date field.

3. Press ENTER to set the chassis date to the date in the input field.

4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the date entered is a valid format, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current value, but it does refresh the Chassis Date field with the previous value.

> Upon saving the new chassis date, all modules installed in the chassis recognize the new value as the current date.

5.7.4   Setting the Chassis Time

To set the chassis time, perform the following steps:

1. Use the arrow keys to highlight the **Chassis Time** field.

2. Enter the time in an 24-hour format, HH:MM:SS.

> When entering the time in the chassis time field, separators between hours, minutes, and seconds do not need to be added as long as each entry uses two numeric characters. For example, to set the time to 6:45 A.M., type "064500".

3. Press ENTER to set the chassis time to the time in the input field.

4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is a valid format, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current value and refreshes the Chassis Time field with the previous value.

> Upon saving the new chassis time, all modules installed in the chassis recognize the new value as the current time.

5.7.5   Entering a New Screen Refresh Time

The screen refresh time is set from 3 to 99 seconds with a default of 3 seconds. To set a new screen refresh time, perform the following steps:

1.   Use the arrow keys to highlight the **Screen Refresh Time** field.

2.   Enter a number from 3 to 99.

3.   Press ENTER to set the refresh time to the time entered in the input field.

4.   Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is within the 3 to 99 seconds range, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current setting, but it does refresh the Screen Refresh Time field with the previous value.

5.7.6   Setting the Screen Lockout Time

The screen lockout time can be set from 1 to 30 minutes with a default of 15 minutes. To set a new lockout time, perform the following steps:

1.   Use the arrow keys to highlight the **Screen Lockout Time** field.

2.   Enter a number from 1 to 30.

3.   Press ENTER to set the lockout time in the input field.

4.   Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is within the 1 to 30 minutes range, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current setting, but it does refresh the Screen Lockout Time field with the previous value.

5.7.7   Setting the Operational Mode

To set the operational mode of all modules within the chassis, perform the following steps:

1. Use the arrow keys to highlight the **Operational Mode** field.

2. Press the SPACE bar to choose either **802.1Q SWITCHING** (all modules in the chassis will operate as IEEE 802.1Q switches which will allow the creation of port-based VLANs) or **802.1D SWITCHING** (all modules in the chassis will operate as traditional switches).

3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER. The warning screen shown in Figure 5-9 displays.
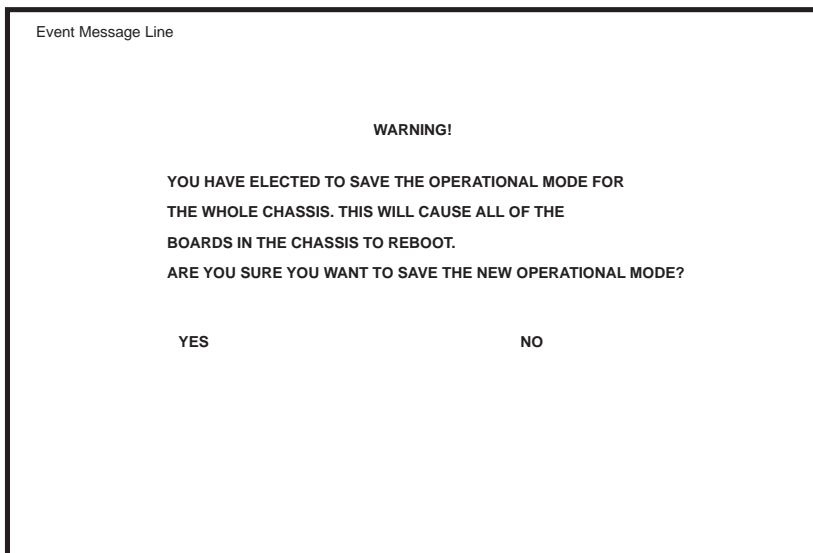
```
 Event Message Line



                              WARNING!

             YOU HAVE ELECTED TO SAVE THE OPERATIONAL MODE FOR
             THE WHOLE CHASSIS. THIS WILL CAUSE ALL OF THE
             BOARDS IN THE CHASSIS TO REBOOT.
             ARE YOU SURE YOU WANT TO SAVE THE NEW OPERATIONAL MODE?


                  YES                              NO




                                                              236216
```

Figure 5-9   Operational Mode Warning Screen

4. Use the arrow keys to highlight the **YES** command and press ENTER. The changes are saved and all the modules installed in the chassis reboot.

If the DLEHF-MA has been set to 802.1Q SWITCHING, refer to the *Port Based VLAN User's Guide* to configure the device for this type of operation.

5.8   SNMP COMMUNITY NAMES SCREEN

The SNMP Community Names menu item allows the user to set Local Management community names. Community names act as passwords to Local/Remote Management and provide security access to the DLM6C-AA. Access to the DLM6C-AA is controlled by enacting any of three different levels of security authorization (read-only, read-write, and super-user).

Super-user access gives the user full management privileges, allows existing passwords to be changed, and all modifiable MIB objects for the Cabletron Container MIB and Internet MIB-II to be edited.

To access the SNMP Community Names screen from the Chassis Menu screen, use the arrow keys to highlight the **SNMP COMMUNITY NAMES** menu item and press ENTER. The SNMP Community Names screen, Figure 5-10, displays.

```
┌──────────────────────────────────────────────────────────────────┐
│ Event Message Line                                                 │
│                       MS 700 LOCAL MANAGEMENT                      │
│                                                                    │
│                       SNMP Community Names                         │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│              Community Name              Access Policy             │
│              public                      read-only                 │
│              public                      read-write                │
│              public                      super-user                │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│     SAVE                      EXIT                      RETURN      │
│                                                                    │
└──────────────────────────────────────────────────────────────────┘
```
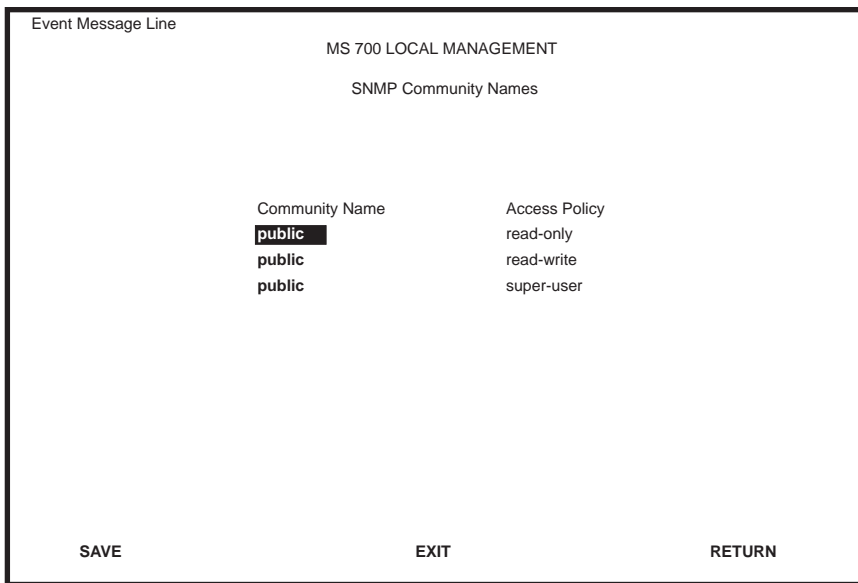
236217

Figure 5-10   SNMP Community Names Screen

The following explains each SNMP Community Names screen field:

Community Name (Modifiable)
Displays the user-defined name through which a user accesses DLM6C-AA management. Any community name assigned here acts as a password to Local/Remote Management.

Access Policy (Read-Only)
Indicates the access accorded each community name. Possible selections are as follows:

read-only	This community name allows read-only access to the DLM6C-AA MIB objects, and excludes access to security-protected fields of read-write or super-user authorization.
read-write	This community name allows read and write access to the DLM6C-AA MIB objects, excluding security protected fields for super-user access only.

super-user   This community name permits read-write
                              access to the DLM6C-AA MIB objects and
                              allows the user to change all modifiable
                              parameters including community names, IP
                              addresses, traps, and SNMP objects.

5.8.1   Establishing Community Names

The password used to access Local Management at the Password screen
must have super-user access in order to view and edit the SNMP
Community Names screen. Using a password with read-only or
read-write access does not allow the user to view or edit the SNMP
Community Names screen.

> Any community name assigned in the SNMP Community
> Names screen is a password to its corresponding level of
> access to Local Management. The community name assigned
> super-user access is the only one that gives the user complete
> access to Local Management.
>
> All passwords assigned in the DLM6C-AA SNMP Community
> Names screen allow access to DLM6C-AA Local Management
> screens, and the Local Management screens of the interface
> modules that are installed in the chassis. To configure the
> interface module to not allow access to DLM6C-AA Local
> Management screens, refer to Section 5.16.

To establish community names, proceed as follows:

1. Use the arrow keys to highlight the **Community Name** field adjacent to
    the selected access level.

2. Enter the password in the field (maximum 31 characters).

3. Press ENTER.

4. Repeat steps 1 through 3 to modify the other community names.

5. Use the arrow keys to highlight **SAVE** at the bottom of the screen and
    press ENTER. The message "SAVED OK" displays. The community
    names are saved to memory and their access modes implemented.

> Exiting without saving causes a "NOT SAVED?" message to display above the **SAVE** command. Edits will be lost if they are not saved before exiting.

6. To exit the screen, use the arrow keys to highlight **RETURN** and press ENTER.

5.9   SNMP TRAPS SCREEN

Since the DLM6C-AA is an SNMP compliant device, it can send messages to multiple Network Management Stations to alert users of status changes. The Chassis SNMP Traps screen is shown in Figure 5-11.

To access the Chassis SNMP Traps screen from the Chassis Menu screen, use the arrow keys to highlight the **SNMP TRAPS** menu item and press ENTER. The SNMP Traps screen displays.

```
Event Message Line
                          MS 700 LOCAL MANAGEMENT

                              SNMP Traps



      Trap Destination        Trap Community Name         Enable Traps
      0.0.0.0                  public                      [NO]
      0.0.0.0                  public                      [NO]
      0.0.0.0                  public                      [NO]
      0.0.0.0                  public                      [NO]
      0.0.0.0                  public                      [NO]
      0.0.0.0                  public                      [NO]
      0.0.0.0                  public                      [NO]
      0.0.0.0                  public                      [NO]




      SAVE                         EXIT                        RETURN
```
1960_96

Figure 5-11   Chassis SNMP Traps Screen

The following explains each field of the SNMP Traps screen:

Trap Destination (Modifiable)
Indicates the IP address of the workstation to receive trap alarms. Up to eight different destinations can be defined.

Trap Community Name (Modifiable)
Displays the community name included in the trap message sent to the
network management station with the associated IP address.

Enable Traps (Toggle)
Enables transmission of the traps to the network management station with
the associated IP address. This field toggles between YES and NO.

5.9.1   Configuring the Trap Table

To configure the trap table, proceed as follows:

1. Using the arrow keys, highlight the appropriate **Trap Destination** field.

2. Enter the IP address of the workstation that is to receive traps. IP address
entries must follow the DDN format.

For example: 134.141.79.121

3. Press ENTER. If an invalid entry is entered "INVALID IP
ENTERED" is displayed in the Event Message Line.

4. Using the arrow keys, highlight the **Trap Community Name** field.
Enter the community name.

5. Press ENTER.

6. Using the arrow keys, highlight the **Enable Traps** field. Press the
SPACE bar to choose either **YES** (send alarms from the chassis to the
workstation), or **NO** (prevent alarms from being sent).

7. Using the arrow keys, highlight the **SAVE** command and press
ENTER. The message "SAVED OK" displays on the screen.

Exiting without saving causes a "NOT SAVED?" message to
appear above the **SAVE** command. Edits will be lost if they are
not saved before exiting.

The designated workstations now receive traps from the DLM6C-AA.

5.10   CHASSIS ENVIRONMENTAL SCREEN

The Chassis Environmental menu item allows the user to view chassis environmental information.

To access the Chassis Environmental Information screen from the Chassis Menu screen, use the arrow keys to highlight the **CHASSIS ENVIRONMENTAL** menu item and press ENTER. The Chassis Environmental Information screen, Figure 5-12, displays.

```
                    MS 700 LOCAL MANAGEMENT

                 Chassis Environmental Information



        Chassis Power Redundancy        Not Available
        Power Supply #1 Status          Normal
        Power Supply #2 Status          Not Installed
        Chassis Fans Status             Normal








                    EXIT                        RETURN
```
236218
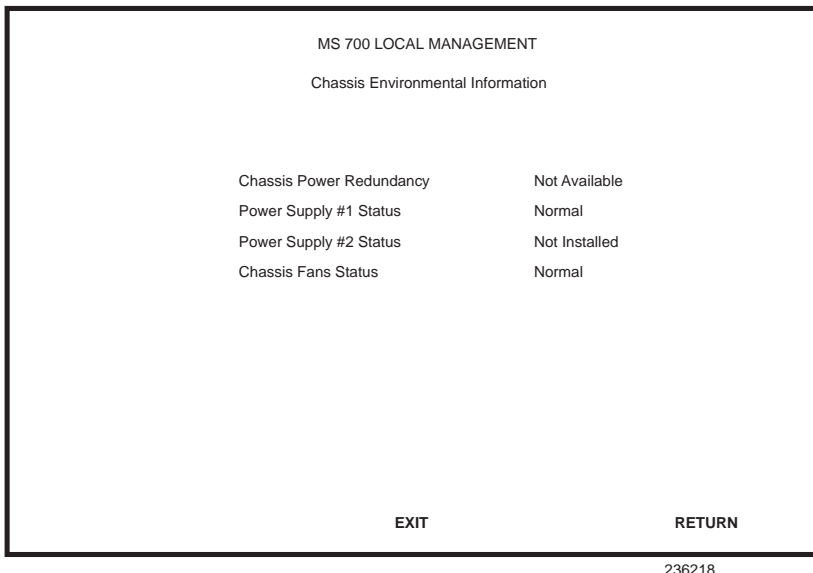
Figure 5-12   Chassis Environmental Information Screen

The following describes each of the Chassis Environmental Information screen fields:

Chassis Power Redundancy (Read-Only)
Displays the current redundancy status of the DLM6C-AA power supplies. This field will read either "Available" or "Not Available".

Power Supply #*X* Status (Read-Only)
Displays the current status of power supplies 1 and 2 for the DLM6C-AA. This field will read either "Normal", "Fault", or "Not Installed".

Chassis Fan Status (Read-Only)
Displays the current status of the DLM6C-AA fan tray. This field will read either "Normal", "Fault", or "Not Installed".

5.11 PORT REDIRECT FUNCTION SCREEN

> The Port Redirect Function screen may only be used if the operational mode of one or more modules has been set to 802.1D SWITCHING. Refer to the Release Notes to verify which operational modes support the Port Redirect Function screen.

The Port Redirect Function screen, Figure 5-13, allows the user to set each one of the modules in the chassis (1 through 5), and the ports (interfaces) of the corresponding module installed, as a source or destination port. A port can be set to have one or more destination port and chassis module slot numbers. For example, port 1 in module (slot) 1 can be set as a source port with three destinations, ports 2, 3, and 4 in module (slot) 3. Traffic from port 1 in module 1 is then automatically redirected to ports 2, 3, and 4 in module 3. Port 1 in module 1 can also serve as a destination port for other ports and modules. The port redirect function is extremely useful for troubleshooting purposes, as it allows traffic to be sent to a particular port(s) where, with the use of an analyzer or RMON probe, all current traffic from the source port(s) can be examined.

> The module number corresponds to the slot number in which the module resides in the DLM6C-AA chassis (1 through 5).

> Although traffic from the source port (including, if desired, errored frames) is sent to the destination port, normal switching is still performed for all frames on the source port.

To access the Port Redirect Function screen from the Chassis Menu screen, use the arrow keys to highlight the **PORT REDIRECT** menu item and press ENTER. The Port Redirect Function screen, Figure 5-13, displays.

```
 Event Message Line
                          MS 700  LOCAL MANAGEMENT

                           Port Redirect Function

        Module Type: DLEHF-MA                      Firmware Revision: xx.xx.xx
        Slot Number: 3                             BOOTPROM Revision: xx.xx.xx

             Source                     Destination              Remap Errors

      Module        Port           Module        Port
        1            1               3             2                   ON
        1            1               3             3                   OFF
        1            1               3             4                   ON
        2            2               1             1                   ON
        2            2               3             3                   ON
        3            3               4             4                   ON
        3            3               5             5                   ON
        3            3               5             8                   ON


          Source Port     [1]        Destination Port    [1]     Status  [ADD]
          Source Module   [1]        Destination Module  [1]     Errors  [ON]

     SAVE          EXIT            NEXT          PREVIOUS          RETURN
```

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Figure 5-13   Port Redirect Function Screen

The following definitions briefly explain each field of the Port Redirect
Function screen:

Source Module (Read-Only)
Displays which modules are currently set as source modules.

Source Port (Read-Only)
Displays which ports (interfaces) are currently set as source ports.

Destination Module (Read-Only)
Displays which modules are currently set as destination modules.

Destination Port (Read-Only)
Displays which ports are currently set as destination ports.

Remap Errors (Read-Only)
Shows whether destination ports and modules are receiving errored
frames and valid traffic (ON) or just valid traffic (OFF).

Source Port [*n*] (Selectable)
Allows a selected port [*n*] to be configured as a source port.

Source Module [*n*] (Selectable)
Allows a selected module [*n*] to be configured as a source module.

Destination Port [*n*] (Selectable)
Allows a selected port [*n*] to be configured as a destination port.

Destination Module [*n*] (Selectable)
Allows a selected module [*n*] to be configured as a destination module.

Status (Toggle)
Allows the user to add or delete the source/destination modules and ports selected in the Source/Destination Modules and Ports fields.

Errors (Toggle)
Allows the user to configure the source modules and ports to either send errored frames and valid traffic to selected destination modules and ports (ON), or to drop errored frames, and send only valid traffic to the destination modules and ports (OFF). The default setting of this field is ON. For information on how to change the default setting, refer to Section 5.11.2.

5.11.1 Displaying the Source and Destination Entries

There can be more than one Port Redirect Function screen depending on the number of port redirect entries. Each screen displays up to ten port redirect entries. If there is more than one screen of redirect entries, the **NEXT** and/or **PREVIOUS** command is displayed at the bottom of the screen, allowing the user to navigate to the next or previous screen.

For example, with three screens of entries, the **NEXT** command is displayed at the bottom of the first screen. In the second screen, the **NEXT** and **PREVIOUS** commands are displayed. In the last screen, only the **PREVIOUS** command is displayed.

To display the next screen, use the arrow keys to highlight **NEXT**. Press ENTER and the next screen of entries is displayed.

To display the previous screen, use the arrow keys to highlight **PREVIOUS**. Press ENTER to view the entries in the previous screen.

5.11.2 Changing Source and Destination Ports

Add or delete source/destination module and port entries as follows:

1. Use the arrow keys to highlight the **Source Module** field.

2. Press the SPACE bar or BACKSPACE one or more times to increment or decrement the module number displayed in the brackets [*n*] until the appropriate module number is displayed.

3. Use the arrow keys to highlight the **Source Port** field.

4. Press the SPACE bar or BACKSPACE one or more times to increment or decrement the port number displayed in the brackets [*n*] until the appropriate port number is displayed.

5. Use the arrow keys to highlight the **Destination Module** field.

6. Use the SPACE bar or BACKSPACE to step to the appropriate module number for the destination module.

7. Use the arrow keys to highlight the **Destination Port** field.

8. Use the SPACE bar or BACKSPACE to step to the appropriate port number for the destination port.

9. Use the arrow keys to highlight the **Status** field.

10. Use the SPACE bar to toggle between the **ADD** and **DEL** (delete) settings. Press ENTER. This adds or deletes the port selections made in steps 2 and 4 and also updates the screen Source Port and Destination Port list.

11. Use the arrow keys to highlight the **Errors** field.

12. Use the SPACE bar to toggle between the **ON** and **OFF** settings. Press ENTER. **ON** forces the source module(s) and port(s) to forward errored frames and valid traffic to the destination module(s) and port(s). **OFF** suppresses errored frames from being sent to the destination modules and ports while allowing valid traffic to pass.

> If more than one module and port is to be redirected, repeat steps 1 through 10 for each additional setting, then go to step 13 to save all the new settings at once.

13. Use the arrow keys to highlight **SAVE** at the bottom of the screen. Press ENTER. The message "SAVED OK" is displayed.

5.12   MODULE SELECTION SCREEN

The Module Selection screen is the access point to Local Management for all modules installed in the MultiSwitch 700 chassis. By selecting a module, the Module Menu for the selected device displays. Figure 5-14 shows the Module Selection screen.

To access the Module Selection screen from the Main Menu screen, use the arrow keys to highlight the **MODULES** menu item and press ENTER.

```
                        MS 700 LOCAL MANAGEMENT

                           Module Selection



        Slot #            Module Name      Serial #      Hardware Revision

         <1>               DLEHF-MA        123456789           XXX
          2                DLE32-MA        123456789           XXX
          3                DLE32-MA        123456789           XXX
          4                DLE28-MA        123456789           XXX
          5




                              EXIT                         RETURN
```
236220

Figure 5-14   Module Selection Screen

The following explains each Module Selection screen field as shown in Figure 5-14:

Slot
The Slot # field displays the slot in which the module is installed. The module number enclosed in < > characters indicates the module to which the management terminal is connected.

Module Name
The Module Name field displays the type of interface module that is installed in each slot.

Serial #

Indicates the serial number of the module. The serial number of the device is necessary when calling your DIGITAL representative.

Hardware Revision

Reflects the hardware version of the module.

5.12.1   Selecting a Module

To select an individual module to perform Local Management functions, proceed as follows:

1. Use the arrow keys to highlight the desired module number in the Slot # field.

2. Press ENTER, the applicable Module Menu screen displays. Proceed to Section 5.13.

5.13   DLEHF-MA MODULE MENU SCREEN

The Module Menu screen is the access point for all Local Management screens for the DLEHF-MA. Figure 5-15 shows the DLEHF-MA Module Menu screen.

```
                    MS 700 LOCAL MANAGEMENT

                         Module  Menu

  Module Type: DLEHF-MA                  Firmware Revision:     XX.XX.XX
  Slot Number: X                         BOOTPROM Revision: XX.XX.XX


                  MODULE CONFIGURATION

                  MODULE STATISTICS

                  NETWORK TOOLS









                        EXIT                          RETURN
```
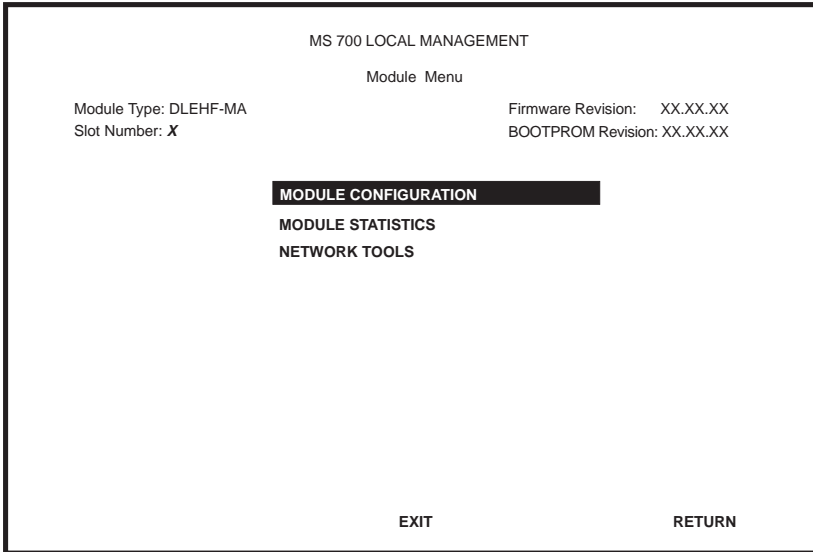
236221

Figure 5-15   Module Menu Screen

The following explains each Module Menu screen field as shown in Figure 5-15:

MODULE CONFIGURATION
The Module Configuration screen provides access to the Local Management screens that are used to configure the DLEHF-MA and also provides access to the Module Specific Configuration Menu screen. The Module Specific Configuration Menu screen provides access to the screens that allow the user to check the DLEHF-MA resources and set operating parameters specific to each port. For details about the Module Configuration Menu screen, refer to Section 5.14. For details about the Module Specific Configuration Menu screen, refer to Section 5.20.

MODULE STATISTICS

The Module Statistics screen provides statistics and performance information for the DLEHF-MA. For details about this screen, refer to Section 5.27.

NETWORK TOOLS

The Network Tools function resides on the DLEHF-MA and consists of a series of commands that allow the user to access and manage network devices. Section 5.31 explains how to use the Network Tools utility.

5.14 MODULE CONFIGURATION MENU SCREEN

The Module Configuration Menu screen, Figure 5-16, provides access to Local Management screens that allow you to configure and monitor operating parameters, modify SNMP community names, set SNMP traps, configure switch parameters and configure the DLEHF-MA ports.

To access the Module Configuration Menu screen from the Module Menu screen, use the arrow keys to highlight the **MODULE CONFIGURATION** menu item and press ENTER. The Module Configuration Menu screen displays.

> The Switch Configuration and SmartTrunk Configuration menu items display only if the operational mode of the chassis or the DLEHF-MA has been set to 802.1D SWITCHING or 802.1Q SWITCHING. Refer to Section 5.7.7 for instructions on configuring the chassis to operate in these modes and Section 5.15.9, for instructions on configuring the DLEHF-MA to operate in these modes.

```
                        MS 700 LOCAL MANAGEMENT

                        Module Configuration  Menu

  Module Type: DLEHF-MA                    Firmware Revision:     XX.XX.XX
  Slot Number: X                           BOOTPROM Revision: XX.XX.XX


                        GENERAL CONFIGURATION

                        SNMP COMMUNITY NAMES

                        SNMP TRAPS

                        SWITCH CONFIGURATION

                        SMARTTRUNK CONFIGURATION

                        MODULE SPECIFIC CONFIGURATION






                             EXIT                         RETURN
```
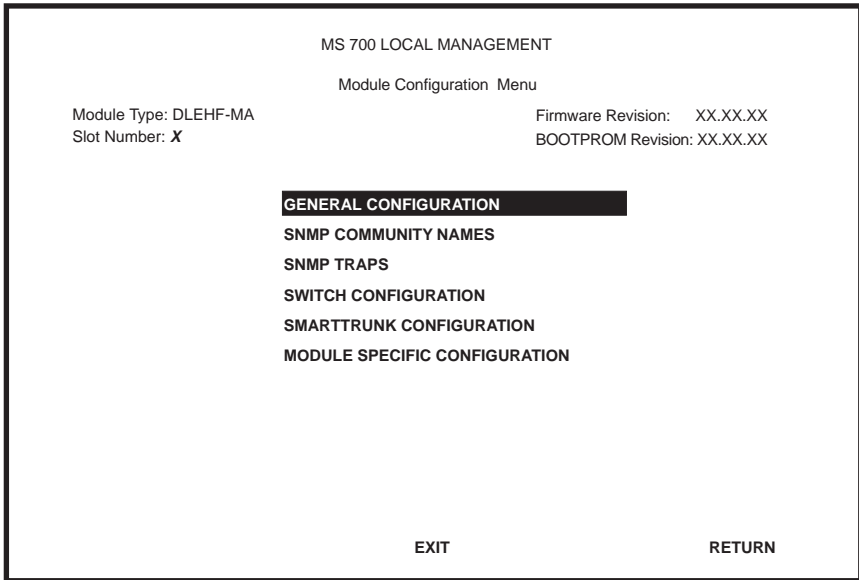
236222

Figure 5-16   Module Configuration Menu Screen

The following briefly explains each screen accessible from the Module
Configuration Menu screen:

GENERAL CONFIGURATION
The General Configuration screen allows the user to monitor and
configure operating parameters for the DLEHF-MA. For details, refer to
Section 5.15.

SNMP COMMUNITY NAMES
The SNMP Community Names screen allows the user to enter new, change, or
review the community names used as access passwords for Local/Remote
management operation. Access is limited based on the password level of the
user. For details, refer to Section 5.16.

SNMP TRAPS
The SNMP Traps screen provides display and configuration access to the
table of IP addresses used for trap destinations and associated community
names. For details, refer to Section 5.17.

SWITCH CONFIGURATION
The Switch Configuration screen provides basic setup options for customizing switch operation. For details, refer to Section 5.18.

SMARTTRUNK CONFIGURATION
The SmartTrunk Configuration screen allows the user to logically group interfaces together to create higher bandwidth uplinks. For details, refer to Section 5.19.

MODULE SPECIFIC CONFIGURATION
The Module Specific Configuration Menu screen allows the user to configure ports or check system resources specific to the DLEHF-MA. For details, refer to Section 5.20.

5.15   GENERAL CONFIGURATION SCREEN

The General Configuration screen, Figure 5-17, allows the user to set the system date and time, IP address and subnet mask, the default gateway, the TFTP gateway IP address, the operational mode, the management mode, and the COM port configuration. The General Configuration screen also allows the user to clear NVRAM and enable or disable IP fragmentation.

To access the General Configuration screen from the Module Configuration Menu screen, use the arrow keys to highlight the **GENERAL CONFIGURATION** menu item and press ENTER. The General Configuration screen, Figure 5-17, displays.

```
Event Message Line
                           MS 700 LOCAL MANAGEMENT

                              General Configuration
        Module Type: DLEHF-MA                    Firmware Revision:     XX.XX.XX
        Slot Number: X                           BOOTPROM Revision: XX.XX.XX


   MAC Address:              00-00-ID-00-00-00      Module Date:        07/11/1997
   IP Address:              000.000.000.000         Module Time:        14:23:00
   Subnet Mask:             255.255.0.0             Screen Refresh Time:  30 sec.
   Default Gateway:         NONE DEFINED            Screen Lockout Time:  15 min.
   TFTP Gateway IP Addr:    0.0.0.0                 Module Uptime XX D  XX H  XX M

   Operational Mode: [802.1D SWITCHING]             Management  Mode: [DISTRIBUTED]


   Com 1:  [ENABLED]      Application:      [LM]

   Clear NVRAM     [NO]     IP Fragmentation  [ENABLED]



       SAVE                          EXIT                        RETURN
```
236223

Figure 5-17   General Configuration Screen

The following briefly explains each General Configuration screen field:

MAC Address (Read-Only)
Displays the physical address of the module.

IP Address (Modifiable)
This display allows the IP address to be set for the DLEHF-MA. To set the IP address, refer to Section 5.15.1.

Subnet Mask (Modifiable)
Displays the subnet mask for the module. A subnet mask "masks out" the network bits of the IP address by setting the bits in the mask to 1 when the network treats the corresponding bits in the IP address as part of the network or subnetwork address, or to 0 if the corresponding bit identifies the host. For details about how to change the subnet mask from its default value, refer to Section 5.15.2.

Default Gateway (Modifiable)
Displays the default gateway for the DLEHF-MA. This field is not defined until an appropriate value is entered. For details about why and how to set the default gateway, refer to Section 5.15.3.

TFTP Gateway IP Addr (Modifiable)
Displays and allows the user to set the TFTP Gateway IP address for the DLEHF-MA. To set the TFTP Gateway IP address, refer to Section 5.15.4.

Module Date (Modifiable)
Contains a value that the module recognizes as the current date. To set a new module date, refer to Section 5.15.5.

Module Time (Modifiable)
Contains a value that the module recognizes as the current time. To enter a new time, refer to Section 5.15.6.

Screen Refresh Time (Modifiable)
Contains the rate at which the screens are updated. This setting determines how frequently (in seconds) information is updated on the screen. To enter a new update time, refer to Section 5.15.7.

Screen Lockout Time (Modifiable)
Contains the maximum number of minutes that the Local Management application displays a module's screen while awaiting input or action from a user. For example, if the number 5 is entered in this field, the user has up to five minutes to respond to each of the specified module's Local Management screens. In this example, after five minutes of "idleness" (no input or action), the terminal "beeps" five times, the Local Management application terminates the session, and the display returns to the Password screen. To enter a new lockout time, refer to Section 5.15.8.

Module Uptime (Read-Only)
Displays the total time that the module has been operating.

Operational Mode (Modifiable)
This field allows the user to set the DLEHF-MA to operate as a traditional switch (802.1D SWITCHING) or an IEEE 802.1Q switch (802.1Q SWITCHING).

In 802.1D Switching mode, the Fast Ethernet Interface Module(s), and HSIM port(s) are bridged to each other. In 802.1Q Switching mode, the DLEHF-MA acts as an IEEE 802.1Q switch, which allows the creation of port-based VLANs. For details on how to select the Operational Mode, refer to Section 5.15.9.

Management Mode (Toggle)
This field toggles between DISTRIBUTED and STAND ALONE. The default field is DISTRIBUTED.

In DISTRIBUTED mode, Local Management is entered via the DLM6C-AA password screen, and all chassis configuration screens are available to the user. All other modules installed in the chassis that are set for distributed management may also be accessed via a connection to a single COM port on one of the modules. The user can then manage all modules within the chassis and the chassis itself.

> If the user is establishing a remote connection (i.e., Telnet or SNMP) using the IP address of the module, the chassis LM screens will not be available. The LM screens for all other modules will also be inaccessible. To access ALL local management screens, the IP address of the chassis must be used to establish the connection.

In STAND ALONE mode, the module is isolated from the chassis configuration screens, and the module may not be accessed from a module that is in DISTRIBUTED mode. This provides additional security for any module to which the user may wish to restrict access.

For details on how to select the Management Mode, refer to Section 5.15.10.

Com (Modifiable)
This field allows the user to enable or disable the COM port. The selection toggles between ENABLED and DISABLED. The default is

ENABLED. For details about setting up the COM port, refer to
Section 5.15.11.

Application (Toggle)

Displays the application set for the COM port. This field allows you to set
the application that the COM port will support, which includes:

• Local Management (LM) via a terminal or modem connection

• Uninterruptible Power Supply (UPS)

The UPS setting allows you to use the COM port to monitor an American
Power Conversion Smart Uninterruptible Power Supply (UPS). For UPS
connections, the baud rate is automatically set to 2400.

The baud rate setting for LM is automatically sensed.

For details about how to configure the COM port for various applications,
refer to Section 5.15.11.

Clear NVRAM (Toggle)

This allows the user to reset NVRAM to the factory default settings. All
user-entered parameters, such as IP address and Community Names are
then replaced with DLEHF-MA default configuration settings. For
details, refer to Section 5.15.12.

IP Fragmentation (Toggle)

This field allows the user to enable or disable IP Fragmentation. The
default setting for this field is ENABLED. If traffic from the DLEHF-MA
will be bridged to an FDDI ring, IP Fragmentation should be enabled. If
IP Fragmentation is disabled, all FDDI frames that exceed the maximum
Ethernet frame size will be discarded. For details on enabling or disabling
IP Fragmentation refer to Section 5.15.13.

5.15.1   Setting the IP Address

To set the IP address, perform the following steps:

> If the DLM6C-AA chassis has been assigned an IP address, it is not necessary to assign an IP address to the DLEHF-MA. All installed modules have the same IP address as the chassis. If a separate IP address for the module is desired, proceed as follows:

1. Use the arrow keys to highlight the **IP Address** field.

2. Enter the IP address into this field using Decimal Dotted Notation (DDN) format.

   For example: 134.141.79.120

3. Press ENTER. If the IP address is a valid format, the cursor returns to the beginning of the IP address field. If the entry is not valid, the Event Message Line displays "INVALID IP ADDRESS OR FORMAT ENTERED". Local Management does not alter the current value and refreshes the IP address field with the previous value.

4. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The warning screen shown in Figure 5 displays.

```
                          WARNING!

    YOU HAVE ELECTED TO SAVE ONE OR MORE CONFIGURATION
    ITEMS THAT REQUIRE RESETTING THIS MODULE.


    ARE YOU SURE YOU WANT TO CONTINUE?

                 YES                    NO



                                                   236224
```

5. Use the arrow keys to highlight the **SAVE** command, then press
ENTER. The warning screen shown in Figure 5 displays.

WARNING!

YOU HAVE ELECTED TO SAVE ONE OR MORE CONFIGURATION
ITEMS THAT REQUIRE RESETTING THIS MODULE.

ARE YOU SURE YOU WANT TO CONTINUE?

YES   **NO**

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---

6. Use the arrow keys to highlight the **YES** command and press ENTER.
The changes are saved and the module reboots.

5.15.2   Setting the Subnet Mask

If the management workstation that is to receive SNMP traps from the
DLEHF-MA is located on a separate subnet, the subnet mask for the
DLEHF-MA must be changed from its default.

To change the subnet mask from its default, perform the following steps:

1. Use the arrow keys to highlight the **Subnet Mask** field.

2. Enter the subnet mask into this field using Decimal Dotted Notation
(DDN) format.

For example: 255.255.255.0

3. Press ENTER. If the subnet mask is valid, the cursor returns to the
beginning of the Subnet Mask field. If the entry is not valid, the Event
Message Line displays "INVALID SUBNET MASK OR FORMAT
ENTERED". Local Management does not alter the current value, but
it does refresh the Subnet Mask field with the previous value.

4. Use the arrow keys to highlight the **SAVE** command and press ENTER. The warning screen shown back in Figure 5 displays.

5. Use the arrow keys to highlight the **YES** command and press ENTER. The changes are saved and the module reboots.

5.15.3   Setting the Default Gateway

If the SNMP management station is located on a different IP subnet than the DLEHF-MA, a default gateway must be specified. When an SNMP Trap is generated, the DLEHF-MA sends the Trap to the default gateway. To set the default gateway, perform the following steps:

1. Use the arrow keys to highlight the **Default Gateway** field.

2. Enter the IP address of the default gateway using the DDN format.

For example: 134.141.79.121

3. Press ENTER. If the default gateway entered is a valid format, the cursor returns to the beginning of the Default Gateway field. If the entry is not valid, the Event Message Line displays "INVALID DEFAULT GATEWAY OR FORMAT ENTERED". Local Management does not alter the current value, but it does refresh the Default Gateway field with the previous value.

4. Use the arrow keys to highlight the **SAVE** command.

5. Press ENTER. The Event Message Line at the top of the screen displays "SAVED OK".

5.15.4   Setting the TFTP Gateway IP Address

If the network TFTP server is located on a different IP subnet than the DLEHF-MA, a gateway IP address must be specified. To set the TFTP Gateway IP address, perform the following steps:

1. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.

2. Enter the IP address of the TFTP gateway using the DDN format.

   For example: 134.141.80.122

3. Press ENTER. If the TFTP gateway IP address entered is a valid format, the cursor returns to the beginning of the TFTP Gateway IP Address field. If the entry is not valid, the Event Message Line displays "INVALID TFTP GATEWAY IP ADDRESS OR FORMAT ENTERED". Local Management does not alter the current value, but it does refresh the TFTP Gateway IP Address field with the previous value.

4. Use the arrow keys to highlight the **SAVE** command.

5. Press ENTER. The Event Message Line at the top of the screen displays "SAVED OK".

5.15.5 Setting the Module Date

The module is year 2000 compliant, so the module date may be set beyond the year 1999.

> If the DLM6C-AA chassis has been assigned a chassis date, it is not necessary to assign a module date to the DLEHF-MA. All installed modules recognize the chassis date of the DLM6C-AA.

To set the module date, perform the following steps:

1. Use the arrow keys to highlight the **Module Date** field.

2. Enter the date in this format: MM/DD/YYYY

> It is not necessary to add separators between month, day, and year numbers. For example, to set the date to 03/17/1997, type "03171997" in the Module Date field.

3. Press ENTER to set the module date to the date in the input field.

4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the date entered is a valid format, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current value, but it does refresh the Module Date field with the previous value.

5.15.6   Setting the Module Time

To set the module time, perform the following steps:

> If the DLM6C-AA chassis has been assigned a chassis time, it is not necessary to assign a module time to the DLEHF-MA. All installed modules recognize the chassis time of the DLM6C-AA.

1. Use the arrow keys to highlight the **Module Time** field.

2. Enter the time in this format: HH:MM:SS

> When entering the time in the system time field, separators between hours, minutes, and seconds do not need to be added as long as each entry uses two numeric characters. For example, to set the time to 6:45 A.M., type "064500" in the Module Time field.

3. Press ENTER to set the module time to the time in the input field.

4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is a valid format, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current value and refreshes the Module Time field with the previous value.

5.15.7   Entering a New Screen Refresh Time

The screen refresh time is set from 3 to 99 seconds with a default of 3 seconds. To set a new screen refresh time, perform the following steps:

1.   Use the arrow keys to highlight the **Screen Refresh Time** field.

2.   Enter a number from 3 to 99.

3.   Press ENTER to set the refresh time to the time entered in the input field.

4.   Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is within the 3 to 99 seconds range, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current setting, but it does refresh the Screen Refresh Time field with the previous value.

5.15.8   Setting the Screen Lockout Time

The screen lockout time can be set from 1 to 30 minutes with a default of 15 minutes. To set a new lockout time, perform the following steps:

1.   Use the arrow keys to highlight the **Screen Lockout Time** field.

2. Enter a number from 1 to 30.

3. Press ENTER to set the lockout time in the input field.

4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER.

If the time entered is within the 1 to 30 minutes range, the Event Message Line at the top of the screen displays "SAVED OK". If the entry is not valid, Local Management does not alter the current setting, but it does refresh the Screen Lockout Time field with the previous value.

5.15.9 Setting the Operational Mode

Before setting the operational mode, ensure that the items contained in this caution are fully understood.

The Management Mode of the module will automatically be set to STAND ALONE. The Management Mode field will no longer display on the General Configuration screen, and the module will no longer support Chassis configuration and Module selection screens.

The module has been assigned SNMP community names from the module SNMP Community Names screen. In Standalone management mode, the module does not use the community names of the DLM6C-AA chassis.

To set the Operational Mode, proceed as follows:

1. Use arrow keys to highlight the **Operational Mode** field.

2. Press the SPACE bar to step to the appropriate operation mode, (**802.1D SWITCHING**, **802.1Q SWITCHING**.

3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER. The warning screen shown back in Figure 5 displays.

4. Use the arrow keys to highlight the **YES** command and press ENTER. The changes are saved and the module reboots.

Upon saving the new operational mode, the module will reboot.

If the DLEHF-MA has been set to **802.1Q SWITCHING**, refer to the *Port Based VLAN User's Guide* to configure the device for this type of operation.

5.15.10 Setting the Management Mode

Upon saving the new operational mode, the module will reboot.

If the module will be set to STAND ALONE, ensure the following procedures have been completed:

The module has been assigned a unique IP address that has been saved (i.e., the module has rebooted and the new IP address is active).

The module has been assigned SNMP community names from the module SNMP Community Names screen. In STAND ALONE management mode, the module does not use the community names of the DLM6C-AA chassis.

To set the Management Mode, proceed as follows:

1. Use arrow keys to highlight the **Management Mode** field.

2. Press the SPACE bar to step to the appropriate management mode, (**DISTRIBUTED** or **STAND ALONE**).

3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen and press ENTER. The warning screen shown back in Figure 5 displays.

4. Use the arrow keys to highlight the **YES** command and press ENTER. The changes are saved and the module reboots.

5.15.11 Configuring the COM Port

Upon power up, the COM port is configured to the default settings of ENABLED and LM.

Before altering the COM port settings, ensure that a valid IP address is set for the module or chassis. (Refer to Section 5.15.1.) Read this entire COM port configuration section before changing the settings of the COM port.

The DLEHF-MA COM port supports the following applications:

- Local Management connections

- American Power Conversion Uninterruptible Power Supply (UPS)
  connections

To configure the COM port, proceed as follows:

1. Use the arrow keys to highlight the **Com 1** field.

> Do **NOT** disable or alter the settings of the COM port while
> operating the current Local Management (LM) connection
> through a terminal. Altering the COM port settings disconnects
> the LM terminal from the port, and ends the LM session. If the
> DLEHF-MA was previously assigned a valid IP address, reenter
> LM by establishing a Telnet connection to the device. If the
> device does not have a valid IP address and the COM port has
> been disabled or the settings changed, reset NVRAM on the
> DLEHF-MA (refer to Appendix C) to reestablish COM port
> communication.

2. Press the SPACE bar to choose either **ENABLED** or **DISABLED**.
The COM port must be **ENABLED** if it will be used for Local
Management or UPS applications. Select **DISABLED** if you wish to
disable the COM port for additional module security.

3. Use the arrow keys to highlight **SAVE**, then press ENTER.

> When the DLM6C-AA chassis is assigned a valid IP address all
> the interface modules installed share this same address.

> If the COM port is reconfigured without a valid IP address set on the
> module or chassis, the message shown in Figure 5-18 displays.
> Do not continue unless you fully understand the outcome of this
> action. If the Warning screen displays, continue on to step 4,
> otherwise, proceed to step 5.

WARNING

THE COM PORT HAS BEEN RECONFIGURED AND THERE IS NO IP
ADDRESS SET FOR THIS DEVICE. YOU WILL NO LONGER BE ABLE
TO MANAGE THIS BOARD. DO YOU STILL WISH TO RECONFIGURE
THIS COM PORT?

YES   **NO**
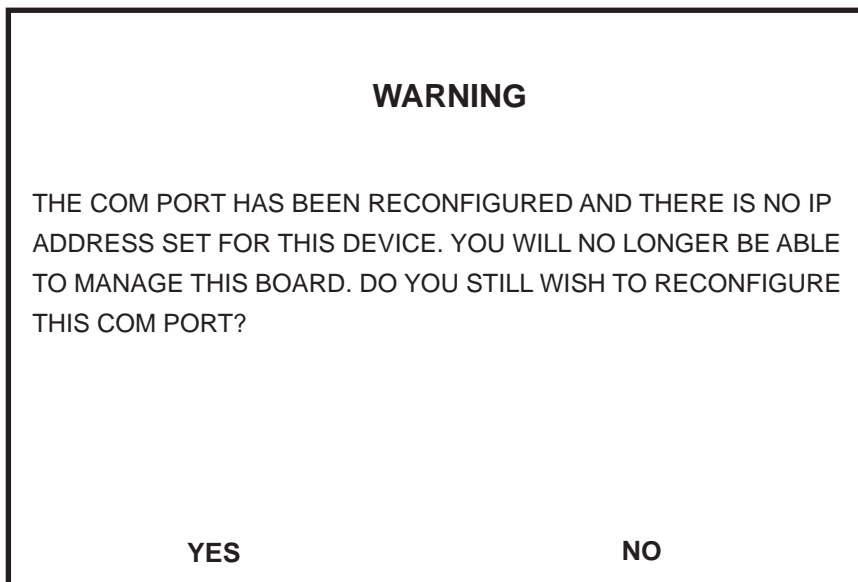
236225

Figure 5-18   COM Port Warning Screen

4. Use the arrow keys to highlight **YES**. Press ENTER.

5. If you **ENABLED** the port, proceed to Section 5. If you **DISABLED**
the port, use the arrow keys to highlight **SAVE** at the bottom of the
screen, then press ENTER. When the message "SAVED OK"
displays, the edits are saved.Changing the Com Port Application

Exiting without saving causes the message "NOT SAVED --
PRESS SAVE TO KEEP CHANGES" to display. Exiting without
saving causes all edits to be lost.

5.15.11.1 Changing the Com Port Application

After enabling the COM port as described in Section 5.15.11, you can
select one of the applications supported by the COM port: LM or UPS.
The default application is LM.

To change the COM port application:

1. Use the arrows keys to highlight the **Application** field.

2. Use the SPACE bar or BACKSPACE to step through the available settings until the operation you require displays. Table 5-3 lists the available settings and their corresponding applications.

Table 5-3. COM Port Application Settings

Setting	Application
LM	Local Management Session
UPS	APC Power Supply SNMP Proxy

3. Press ENTER to accept the application.

⚠️ When the COM port is configured to perform the UPS application, all future Local Management connections must be made by establishing a Telnet connection to the module. Ensure that the module has a valid IP address before saving changes to the COM port application. If the module does not have a valid IP address and the changes are saved, refer to Appendix C for instructions on clearing NVRAM in order to reestablish COM port communications.

4. Use the arrow keys to highlight **SAVE** at the bottom of the screen, then press the ENTER key.

5. When the message "SAVED OK" displays, the edits are saved.

5.15.12 Clearing NVRAM

> ⚠️ Clearing NVRAM will result in the loss of all user-entered parameters. Do not proceed unless you completely understand this procedure.

Clearing NVRAM allows the user to clear all user-entered parameters, such as IP address and Community Names, from NVRAM.

Clear NVRAM as follows:

1. Use the arrow keys to highlight the **Clear NVRAM** field.

2. Use the SPACE bar to toggle the field to **YES**.

3. Use the arrow keys to highlight **SAVE** at the bottom of the screen.

4. Press ENTER. The warning shown in Figure 5-19 displays.

5. Use the arrow keys to highlight **YES** and press ENTER. The message "CLEARING NVRAM. REBOOT IN PROGRESS..." displays.

The DLEHF-MA clears NVRAM and reboots. All user-entered parameters default to factory settings.

WARNING

YOU HAVE ELECTED TO CLEAR NVRAM. THIS WILL CLEAR
ALL SYSTEM DEFAULTS INCLUDING BUT NOT LIMITED TO
IP ADDRESS, INTERFACE CONFIGURATION, AND COM PORT
CONFIGURATION, THEN REBOOT THIS MODULE.
ARE YOU SURE YOU WANT TO CLEAR NVRAM?

YES   **NO**
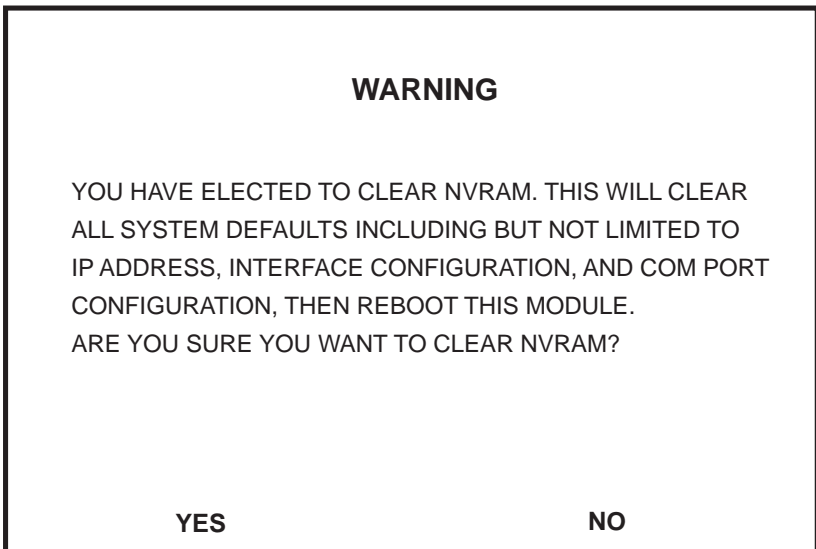
236226

Figure 5-19   Clear NVRAM Warning Screen

5.15.13 Enabling/Disabling IP Fragmentation

To enable or disable IP fragmentation, proceed as follows:

1. Use the arrow keys to highlight the **IP Fragmentation** field.

2. Press the SPACE bar to choose either **ENABLED** or **DISABLED**.

3. Use the arrow keys to highlight the **SAVE** command.

4. Press ENTER. The Event Message Line at the top of the screen displays "SAVED OK".

> If the DLEHF-MA is being bridged to an FDDI ring IP Fragmentation should be enabled. If IP Fragmentation is disabled, all FDDI frames that exceed the maximum Ethernet frame size will be discarded.

5.16 SNMP COMMUNITY NAMES SCREEN

The SNMP Community Names menu item allows the user to set Local/Remote Management community names. Community names act as passwords to Local/Remote Management and are agents of security access to the DLEHF-MA. Access to the DLEHF-MA is controlled by enacting any of three different levels of security authorization (read-only, read-write, and super-user).

> If the DLM6C-AA has been assigned community names, it is not necessary to assign community names to the individual modules installed in the chassis unless you wish to limit access to DLM6C-AA chassis screens by assigning different community names to the module. When this is done, access is limited to the screens specific to the module the terminal is attached to and the Local Management session will begin at the Module Menu screen.
>
> Super-user access gives the user full management privileges, allows existing passwords to be changed, and all modifiable MIB objects for the Cabletron Container MIB and Internet MIB-II to be accessed.

To access the SNMP Community Names screen from the Module Configuration Menu screen, use the arrow keys to highlight the **SNMP COMMUNITY NAMES** menu item and press ENTER. The SNMP Community Names screen, Figure 5-20, displays.
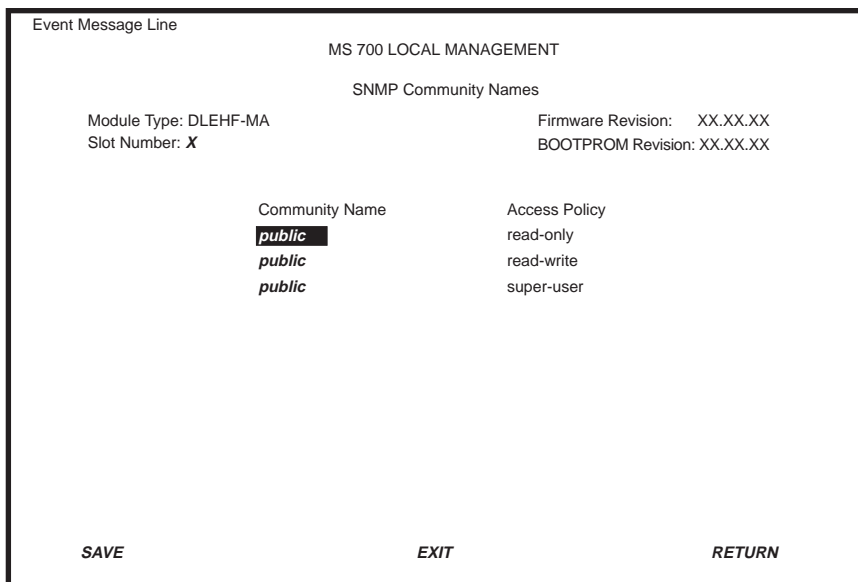
```
Event Message Line
                        MS 700 LOCAL MANAGEMENT

                         SNMP Community Names

     Module Type: DLEHF-MA                 Firmware Revision:    XX.XX.XX
     Slot Number: X                        BOOTPROM Revision: XX.XX.XX



                  Community Name            Access Policy
                  public                    read-only
                  public                    read-write
                  public                    super-user










     SAVE                        EXIT                       RETURN
```
236227

Figure 5-20   SNMP Community Names Screen

The following explains each SNMP Community Names screen field:

Community Name (Modifiable)

Displays the user-defined name through which a user accesses
DLEHF-MA management. Any community name assigned here acts as a
password to Local/Remote Management.

Access Policy (Read-Only)

Indicates the access accorded each community name. Possible selections
are as follows:

read-only   This community name allows read-only access
                           to the DLEHF-MA MIB objects, and excludes
                           access to security-protected fields of read-write
                           or super-user authorization.

read-write   This community name allows read and write
                           access to the DLEHF-MA MIB objects,
                           excluding security protected fields for
                           super-user access only.

super-user   This community name permits read-write
                              access to the DLEHF-MA MIB objects and
                              allows the user to change all modifiable
                              parameters including community names, IP
                              addresses, traps, and SNMP objects.

5.16.1 Establishing Community Names

The password used to access Local Management at the Password Screen
must have super-user access in order to view and edit the SNMP
Community Names screen. Using a password with read-only or
read-write access does not allow the user to view or edit the SNMP
Community Names screen.

> Any community name assigned in the SNMP Community
> Names screen is a password to its corresponding level of
> access to Local/Remote Management. The community name
> assigned super-user access is the only one that gives the user
> complete access to Local/Remote Management.

To establish community names, proceed as follows:

1. Use the arrow keys to highlight the **Community Name** field adjacent
to the selected access level.

2. Enter the password in the field (maximum 31 characters).

3. Press ENTER.

4. Repeat steps 1 through 3 to modify the other community names.

5. Use the arrow keys to highlight **SAVE** at the bottom of the screen and
press ENTER. The message "SAVED OK" displays. The community
names are saved to memory and their access modes implemented.

> Exiting without saving causes a "NOT SAVED?" message to
> display. Edits will be lost if they are not saved before exiting.

5.17   SNMP TRAPS SCREEN

Since the DLEHF-MA is an SNMP compliant device, it can send
messages to multiple network management stations to alert users of status
changes. The SNMP Traps screen is shown in Figure 5-21.

> It is only necessary to assign SNMP traps if the user desires
> the traps to be sent to different addresses than those assigned
> in Section 5.9 which details how to set SNMP traps for the
> DLM6C-AA chassis.

To access the SNMP Traps screen from the Module Configuration Menu
screen, use the arrow keys to highlight the **SNMP TRAPS** menu item and
press ENTER. The SNMP Traps screen displays.

```
 Event Message Line
                              MS 700 LOCAL MANAGEMENT

                                    SNMP Traps

          Module Type: DLEHF-MA                 Firmware Revision:    XX.XX.XX
          Slot Number: X                        BOOTPROM Revision: XX.XX.XX


          Trap Destination          Trap Community Name        Enable Traps
          0.0.0.0                    public                       [NO]
          0.0.0.0                    public                       [NO]
          0.0.0.0                    public                       [NO]
          0.0.0.0                    public                       [NO]
          0.0.0.0                    public                       [NO]
          0.0.0.0                    public                       [NO]
          0.0.0.0                    public                       [NO]
          0.0.0.0                    public                       [NO]




          SAVE                        EXIT                      RETURN

                                                                   236228
```

Figure 5-21   SNMP Traps Screen

The following explains each field of the SNMP Traps screen:

Trap Destination (Modifiable)
Indicates the IP address of the workstation to receive trap alarms. Up to
eight different destinations can be defined.

Trap Community Name (Modifiable)
Displays the community name included in the trap message sent to the
network management station with the associated IP address.

Enable Traps (Toggle)
Enables transmission of the traps to the network management station with
the associated IP address. This field toggles between YES and NO.

5.17.1   Configuring the Trap Table

To configure the trap table, proceed as follows:

1. Using the arrow keys, highlight the appropriate **Trap Destination**
    field.

2. Enter the IP address of the workstation that is to receive traps. IP
    address entries must follow the DDN format.

    For example: 134.141.79.121

3. Press ENTER. If an invalid entry is entered "INVALID IP
    ENTERED" is displayed in the Event Message Line.

4. Using the arrow keys, highlight the **Trap Community Name** field.
    Enter the community name.

5. Press ENTER.

6. Using the arrow keys, highlight the **Enable Traps** field. Press the
    SPACE bar to choose either **YES** (send alarms from the module to the
    workstation), or **NO** (prevent alarms from being sent).

7. Using the arrow keys, highlight the **SAVE** command and press
    ENTER. The message "SAVED OK" displays on the screen.

> Link traps may be disabled by using Network Tools. Refer to
> Section 5.31 for more details.

The designated workstations now receive traps from the DLEHF-MA.

5.18   SWITCH CONFIGURATION SCREEN

The Switch Configuration screen displays only if the operational mode of the chassis or the DLEHF-MA has been set to 802.1D SWITCHING or 802.1Q SWITCHING. Refer to Section 5.7.7 for instructions on configuring the chassis to operate in this mode and Section 5.15.9 for instructions on configuring the DLEHF-MA to operate in this mode.

The Switch Configuration screen, Figure 5-22, provides the basic setup options to make a switch operational in your network.

To access the Switch Configuration screen from the Module Configuration Menu screen, use the arrow keys to highlight the **SWITCH CONFIGURATION** menu item and press ENTER. The Switch Configuration screen, Figure 5-22, displays ports 1 through 8.

Ports 1 through 4 on the screen represent the optional Fast Ethernet Interface Modules and HSIMs (Ports 1 and 2 correspond to the Fast Ethernet slots and ports 3 and 4 correspond to the HSIM slots). Ports 5 through 8 represent the backplane connections that the module has with the DLM6C-AA chassis. The module has a direct connection to every other slot in the chassis.

```
Event Message Line
                             MS 700 LOCAL MANAGEMENT

                                Switch Configuration

        Module Type: DLEHF-MA                     Firmware Revision:    XX.XX.XX
        Slot Number: X                            BOOTPROM Revision: XX.XX.XX


        Switch  Address:  00-00-1D-00-00-00       Type of STA:        [IEEE]
        Number of Ports:   8                      Age Time  (sec):    300

        Port #            MAC Address             State             Status

        1                 00-00-1D-00-00-00       learning          [ENABLED]
        2                 00-00-1D-00-00-01       listening         [ENABLED]
        3                 00-00-1D-00-00-02       blocking          [ENABLED]
        4                 00-00-1D-00-00-03       disabled          [DISABLED]
        5                 00-00-1D-00-00-04       listening         [ENABLED]
        6                 00-00-1D-00-00-05       listening         [ENABLED]
        7                 00-00-1D-00-00-06       listening         [ENABLED]
        8                 00-00-1D-00-00-07       listening         [ENABLED]

        SAVE                        EXIT                            RETURN
```

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Figure 5-22   Switch Configuration Screen

The following describes each field of the Switch Configuration screen:

Switch Address (Read-Only)
Displays the MAC address of the switch.

Number of Ports (Read-Only)
Displays the total number of switched ports on the module.

Type of STA (Selectable)
Allows the user to set the method that switches use to decide which switch is the controlling (Root) switch when two or more switches exist in parallel (Spanning Tree Algorithm). Valid entries include IEEE, DEC, and NONE. To set the STA, refer to Section 5.18.1.

Age Time (Modifiable)
Allows the user to set the amount of time (in seconds) the DLEHF-MA will keep an address in its switch table before discarding it. The modules will discard an address from their switch table if they do not receive a valid packet from the applicable address in the amount of time specified in the Age Time field. To change the Age Time field from the default value of 300 seconds, refer to Section 5.18.2.

Port # (Read-Only)
Lists each switch port on the module.

MAC Address (Read-Only)
Displays the hardware address assigned to each listed port.

State (Read-Only)
Disabled: Management disabled this interface. No traffic is received or forwarded while the interface is disabled.

Learning: The switch is learning the network addresses on this interface. The switch enters the learning state when the Transparent Database is created (during start-up or after being deleted), or when the Spanning Tree Algorithm detects a network topology change.

Listening: The switch is not adding information to the Transparent Database. The switch is monitoring BPDU traffic while preparing to move from the learning to the forwarding state.

Forwarding: The switch is on line and this interface is forwarding traffic.

Blocking: This interface will not forward any traffic through the switch because a loop condition has been detected by the STA.

Status (Toggle)
Allows the user to disable or enable a port by setting the status of the listed interface to either ENABLED or DISABLED. To set the port status, refer to Section 5.18.3.

5.18.1 Setting the STA

The Spanning Tree Algorithm (STA) setting allows the user to set the method that the switches use to decide which is the controller (Root) switch when two or more switches are in parallel. The available selections are IEEE, DEC, and NONE.

To set the STA, proceed as follows:

1. Use the arrow keys to highlight the **Type of STA** field.

2. Use the SPACE bar to step to the appropriate setting (**IEEE**, **DEC**, or **NONE**).

3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.

4. Press ENTER. The message "SAVED OK" is displayed.

5.18.2   Setting the Age Time

To set the Age Time, proceed as follows:

1. Use the arrow keys to highlight the **Age Time** field.

2. Enter the desired Age Time in increments of 10. The available Age Time range is 10 seconds to 1,000,000 seconds with the default value being 300 seconds.

3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.

4. Press ENTER. The message "SAVED OK" is displayed.

5.18.3   Setting (Enabling or Disabling) the Port Status

To set the status of an interface (port), proceed as follows:

Disabling the port status of a backplane connection will block the module from passing user traffic to the applicable module slot in the DLM6C-AA chassis. However, SNMP and other management traffic (e.g., ping and Telnet traffic) will still pass via the backplane to the applicable module slot.

1. Use the arrow keys to highlight the **Status** field of the port.

2. Use the SPACE bar to toggle to either **ENABLED** or **DISABLED**.

3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.

4. Press ENTER. The message "SAVED OK" is displayed.

5.19   SmartTrunk CONFIGURATION

Before discussing the SmartTrunk Configuration screen and how to use it, it is necessary to understand what SmartTrunk is and the port connection and configuration rules that must be followed. Failure to follow these rules will produce poor network performance. For SmartTrunk configuration rules, proceed to Section 5.19.1.

5.19.1   SmartTrunk Configuration Rules

The following rules must be followed when installing the DLEHF-MA to operate in a network configuration using SmartTrunking. These rules also apply to other devices that support the SmartTrunk application.

1. Only ports designated as NETWORK ports, through Local or Remote Management screens, will be considered for SmartTrunking.

2. All non-SmartTrunking interfaces MUST be designated as USER ports.

3. A maximum of 12 ports may be used per instance, and there may only be 8 instances per device.

4. If three or more devices are connected together for SmartTrunking, then the ports that connect any of the two devices together MUST be designated as USER ports to prevent a network loop condition. The port with the least amount of bandwidth available would be the port(s) that should be designated a USER port.

5. You cannot loop front panel ports back to the same standalone device. If the devices are modules residing in a chassis, then you cannot loop back to the same module in the same chassis or to different modules within that chassis. This includes all backplane interfaces that may display on the SmartTrunk Configuration screen.

6. Enabling Spanning Tree is a requirement before enabling SmartTrunk. Spanning Tree will 'block' any ports not used by SmartTrunk that are looped. This can include NETWORK and USER ports. The reason for the blocking of a NETWORK port is that the port at the other end of the link may be configured as a USER port.

Other Considerations

- If a network loop exists and SmartTrunk becomes disabled, and Spanning Tree is operational, then the Spanning Tree algorithm will respond and block the necessary ports.

- If SmartTrunk becomes disabled, and a network loop exists, and Spanning Tree is not-operational (disabled), then an infinite packet loop would occur, taking down the network.

- If a port is disabled and as a result SmartTrunk is no longer active, then all traffic is redirected over the remaining port(s).

- If three or more interface modules, such as the DLEHF-MA, or standalone devices are connected together in a loop condition and all the ports that connect the loop are set to NETWORK, the results are unpredictable. In this case all ports are assigned as NETWORK ports and none are configured as USER ports. This is deemed an illegal configuration.

- If a network loop exists when a port is disabled, then SmartTrunk will reconfigure the remaining ports and continue to distribute traffic.

- If a device has multiple instances to separate modules installed in the same chassis, the results are unpredictable. DIGITAL does not recommend implementing this type of configuration.

5.19.2   SmartTrunk Configuration Screen

The SmartTrunk Configuration screen displays only if the operational mode of the chassis or the DLEHF-MA has been set to 802.1D SWITCHING or 802.1Q SWITCHING. Refer to Section 5.7.7 for instructions on configuring the chassis to operate in this mode and Section 5.15.9 for instructions on configuring the DLEHF-MA to operate in this mode.

The SmartTrunk Configuration screen, Figure 5-23, allows the user to logically group interfaces together between devices to achieve greater bandwidth between the devices.

To access the SmartTrunk Configuration Screen from the Module Configuration Menu screen, use the arrow keys to highlight the

SMARTTRUNK CONFIGURATION menu item and press ENTER. The SmartTrunk Configuration Screen displays.

> Interfaces with the Port Name "Backplane" and "Host" may display on this screen. These ports may not be used for SmartTrunking.

```
 Event Message Line
                         MS 700 LOCAL MANAGEMENT

                       Smart Trunk Configuration Screen

     Module Type: DLEHF-MA                Firmware Revision:    XX.XX.XX
     Slot Number: X                       BOOTPROM Revision: XX.XX.XX

     Port #   Port Name   Connection    SmartTrunk State    Instance   # STPorts
     1        Fast Enet   [NETWORK]     SmartTrunking          1          2
     2        Fast Enet   [NETWORK]     SmartTrunking          1          2
     3        Wan         [USER]        None                   0          0
     4        Wan         [USER]        None                   0          0




          ENABLE                    EXIT                    RETURN
```

                                                                    236230

Figure 5-23   SmartTrunk Configuration Screen

The following explains each field of the SmartTrunk Configuration Screen:

Port # (Read-only)
Identifies the number of the port.

Port Name (Read-only)
These are the names assigned, by DIGITAL, for all bridging interfaces.

Connection (Toggle)
Enables the connection type for the interface. This field toggles between USER and NETWORK. USER is not used for load sharing; NETWORK is used for load sharing. At least two ports must be designated as NETWORK to perform load sharing.

SmartTrunk State (Read-only)
Displays the current operating state of the port — None, Blocking, or
SmartTrunking. None means that the port is operating as a normal switch
port. Blocking means that the port is load sharing, but in the blocked
mode. SmartTrunking means that the port is load sharing.

Instance (Read-only)
Identifies the ports that are grouped together to share traffic load (load
sharing). In Figure 5-23, ports 1 and 2 make up a group identified as
Instance **1** that together share traffic.

 # STPorts (Read-only)
Identifies which ports are grouped (an instance). For example, in
Figure 5-23 Instance **1** consists of 2 ST ports (ports 1 and 2).

5.19.3   Enabling the Connection

To enable the Connection type, proceed as follows:

1. Use the arrow keys to highlight the **Connection** field for the selected
   port(s).

2. Press the SPACE bar to select **USER** or **NETWORK**.

3. Use the arrows keys to highlight the **ENABLE** command at the bottom
   of the screen.

4. Press ENTER. The message "SAVED OK" is displayed.

5.20   MODULE SPECIFIC CONFIGURATION SCREEN

The Module Specific Configuration screen, Figure 5-24, allows the user
to select one of several screens to, among other things, configure ports or
check system resources specific to the DLEHF-MA.

To access the Module Specific Configuration screen from the Module
Configuration Menu screen, use the arrow keys to highlight the
MODULE SPECIFIC CONFIGURATION menu item and press
ENTER. The Module Specific Configuration screen displays.

The Broadcast Suppression menu item displays only if the operational mode of the chassis or the DLEHF-MA has been set to 802.1D SWITCHING or 802.1Q SWITCHING. Refer to Section 5.7.7 for instructions on configuring the chassis to operate in this mode and Section 5.15.9 for instructions on configuring the DLEHF-MA to operate in this mode.
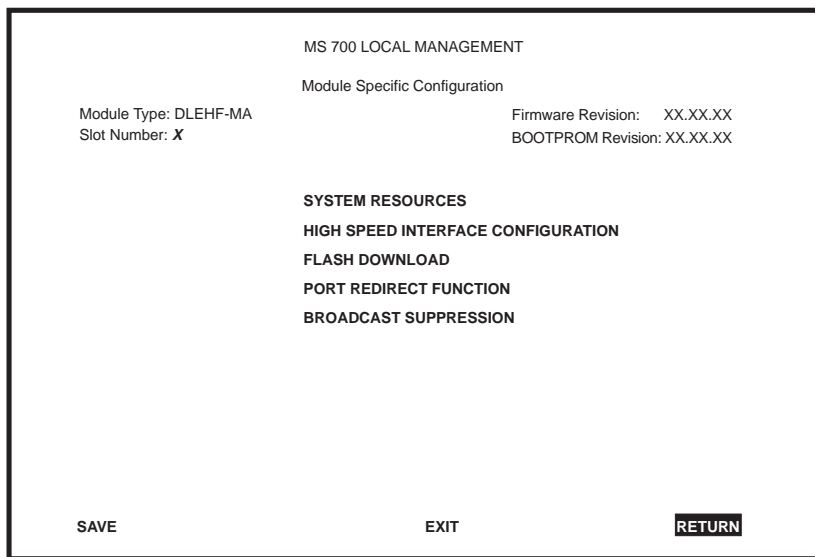
```
                        MS 700 LOCAL MANAGEMENT

                    Module Specific Configuration
Module Type: DLEHF-MA                    Firmware Revision:     XX.XX.XX
Slot Number: X                           BOOTPROM Revision: XX.XX.XX


                    SYSTEM RESOURCES

                    HIGH SPEED INTERFACE CONFIGURATION

                    FLASH DOWNLOAD

                    PORT REDIRECT FUNCTION

                    BROADCAST SUPPRESSION








    SAVE                          EXIT                RETURN
```
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Figure 5-24   Module Specific Configuration Screen

The following explains each field of the Module Specific Configuration screen:

SYSTEM RESOURCES
The System Resources screen displays the amount of FLASH memory, DRAM, and NVRAM installed, available memory, and information on DLEHF-MA operation. For details, refer to Section 5.21.

HIGH SPEED INTERFACE CONFIGURATION
The High Speed Interface Configuration Menu screen provides access to the Fast Ethernet Interfaces screen and the HSIM screens. For details, refer to Section 5.22.

FLASH DOWNLOAD

The FLASH Download screen allows the user to download a new firmware image to FLASH memory on the DLEHF-MA from a TFTP server. For details, refer to Section 5.24.

PORT REDIRECT FUNCTION

The Port Redirect Function screen allows the user to redirect traffic from one or multiple ports to a specific destination port. For details, refer to Section 5.25.

BROADCAST SUPPRESSION

The Broadcast Suppression screen allows the user to set a desired limit of receive broadcast frames per port per second. For details, refer to Section 5.26.

802.1Q VLAN CONFIGURATION

This menu item will only display if the module has been configured to operate as an IEEE 802.1Q switch. When selected, this menu item opens the VLAN Main Menu screen. For details, refer to the *DIGITAL MultiSwitch* 700 *Port Based VLAN User's Guide*. Section 5.15.9 describes how to configure the module to function as an 802.1Q switch.

5.21   SYSTEM RESOURCES SCREEN

The System Resources screen, Figure 5-25, provides information concerning the processor used in the DLEHF-MA and the amount of FLASH memory, DRAM, and NVRAM that is installed and how much of that memory is available.

To access the System Resources screen from the Module Specific Configuration screen, use the arrow keys to highlight the **SYSTEM RESOURCES** menu item and press ENTER. The System Resources screen displays.

```
Event Message Line
                        MS 700 LOCAL MANAGEMENT

                            System Resources

       Module Type: DLEHF-MA                  Firmware Revision:    XX.XX.XX
       Slot Number: 1                         BOOTPROM Revision: XX.XX.XX

                        CPU Type: i960 HT 25Mhz

           Flash Memory Installed:  4 MB       Available:       XXXXX Bytes

           DRAM Installed:          20 MB      Available:       XXXXX Bytes

           NVRAM Installed:         XX KB      Available:        XXXXX Bytes

                        Current Switch Utilization: 66%
                        Peak Switch Utilization: 75%

                        Reset Peak Switch Utilization: [NO]



       SAVE                         EXIT                        RETURN
```

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Figure 5-25   System Resources Screen

The following briefly explains each field of the System Resources screen:

CPU Type (Read-only)
Indicates the microprocessor used in the DLEHF-MA.

Flash Memory Installed (Read-only)
Indicates the amount of FLASH memory installed in the DLEHF-MA and how much is currently available.

DRAM Installed (Read-only)
Indicates the amount of DRAM installed in the DLEHF-MA and how much of it is currently available.

NVRAM Installed (Read-only)

Indicates the amount of NVRAM installed in the DLEHF-MA and how much of it is currently available.

Current Switch Utilization (Read-only)

Shows how much (percentage of switch capacity) the DLEHF-MA is currently being used.

Peak Switch Utilization (Read-only)

Shows the peak percentage of maximum switching capacity, since last reset.

Reset Peak Switch Utilization (Toggle)

Allows the user to reset the Peak Switch Utilization field. The switch may be set to either YES or NO. YES resets the Peak Switch Utilization field to zero.

5.21.1 Resetting the Peak Switch Utilization

To reset the peak switch utilization to zero, proceed as follows:

1. Use the arrow keys to highlight the **Reset Peak Switch Utilization** field.

2. Press the SPACE bar to select **YES**.

3. Use the arrows keys to highlight the **SAVE** command at the bottom of the screen.

4. Press ENTER. The message "SAVED OK" is displayed.

5.22 HIGH SPEED INTERFACE CONFIGURATION MENU SCREEN

This screen does not display unless one, or both, Fast Ethernet Interface modules and an HSIM are installed.

This screen will also not display if the HSIM that is installed is a DLEHW-UA. Access to their Local Management screens is via their respective ASYNC ports. Refer to the associated HSIM user's guides for more details.

To access the High Speed Interface Configuration Menu screen, Figure 5-26, from the Module Specific Configuration screen, use the

arrow keys to highlight the **HIGH SPEED INTERFACE CONFIGURATION** menu item and press ENTER. The High Speed Interface Configuration Menu screen displays.

```
                        MS 700 LOCAL MANAGEMENT

                  High Speed Interface Configuration Menu
Module Type: DLEHF-MA                    Firmware Revision:    XX.XX.XX
                                         BOOTPROM Revision: XX.XX.XX




                        FAST ETHERNET INTERFACES
                               HSIMS






     SAVE                          EXIT                   RETURN
```

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Figure 5-26   High Speed Interface Configuration Menu Screen

The following briefly explains each screen accessible from the High Speed Interface Configuration Menu screen:

FAST ETHERNET INTERFACES
Displays the types of Fast Ethernet Interface Modules installed in ports 1 and 2, their current operating mode, and indicates if the ports are linked. This screen also allows the user to enable or disable Auto-Negotiation and set the Advertised Ability.

HSIMS
Displays the types of interfaces installed in the High Speed Interface Module (HSIM) slots. The HSIM screens are depicted in their associated user's guides.

5.23 HIGH SPEED INTERFACE CONFIGURATION SCREEN

> The High Speed Interface Configuration screen, Figure 5-27, applies only to Fast Ethernet Interface Module ports 1 and 2. This screen supports the DELTX-UI, DELFX-UI and DELF3-UI Fast Ethernet Interface Modules that operate at 100 Mbps.

If you are configuring an HSIM which is installed in the DLEHF-MA, use the arrow keys to highlight the **HSIMS** menu item and press ENTER. Then refer to the applicable HSIM User's Guide for further information.

The High Speed Interface Configuration screen displays the types of Fast Ethernet Interface Modules installed in ports 1 and 2, their current operating mode, and indicates if the ports are linked. This screen also allows the user to enable or disable Auto-Negotiation and set the Advertised Ability.

To access the High Speed Interface Configuration screen from the High Speed Interface Configuration Menu screen, use the arrow keys to highlight the **FAST ETHERNET INTERFACES** menu item and press ENTER. The High Speed Interface Configuration screen displays.

```
┌─────────────────────────────────────────────────────────────────────┐
│  Event Message Line                                                   │
│                          MS 700 LOCAL MANAGEMENT                      │
│                                                                       │
│                     High Speed Interface Configuration                │
│     Module Type: DLEHF-MA                    Firmware Revision:    XX.XX.XX │
│     Slot Number: X                           BOOTPROM Revision: XX.XX.XX │
│                                                                       │
│                          Port 1                      Port 2           │
│     Port Type            DELTX-UI                    Unknown          │
│     Link Status          Link                        No Link          │
│     Current Oper. Mode   100Base-TXFD                [N/A]            │
│     Desired Oper. Mode   [Auto-Negotiation]          [N/A]            │
│     Advertised Ability   [100Base-TXFD]  [Disabled]  [N/A]            │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│      SAVE                    EXIT                      RETURN         │
└─────────────────────────────────────────────────────────────────────┘
```

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Figure 5-27   High Speed Interface Configuration Screen for the DLEHF-MA

The following briefly explains each field of the High Speed Interface Configuration screen:

Port Type (Read-Only)
Displays the name of the interface (DELFX-UI, DELTX-UI or DELF3-UI) installed in ports 1 and 2. Figure 5-27 shows that there is a DELTX-UI interface installed in port 1 and no interface, indicated by Unknown, in Port 2.

Link Status (Read-Only)
Indicates whether or not there is a physical connection from this port to another 10BASE-T or 100BASE-TX/FX device. One of the following values is displayed:

• Link – There is a link signal present and a valid physical connection to another 10BASE-T or 100BASE-TX/FX device.

• No Link – There is no link signal present and there is no valid physical connection to another device.

Current Oper. Mode (Read-only)

This field displays the current operating mode of ports 1 and 2. Depending on the interface installed (100BASE-FX or 100BASE-TX) this field displays the following:

- With a 100BASE-FX interface: 100Base-FX or 100Base-FXFD (full duplex).

- With a 100BASE-TX interface: Unknown, 10Base-T, 10Base-TFD (full duplex), 100Base-TX, or 100Base-TXFD (full duplex).

Desired Oper. Mode (Selectable)

This field allows the user to select the desired operational mode for an interface in port 1 or 2. The field toggles between 100Base-FX and 100Base-FXFD (full duplex) when an DELFX-UI or DELF3-UI is installed. Section 5.23.1 describes how to configure a port with a DELFX-UI or DELF3-UI.

> In normal operation, the port with a DELTX-UI installed automatically establishes a link with the device at the other end of the segment without requiring user setup. However, LM provides the option of manually configuring that port.

If a DELTX-UI is installed, the field toggles to Auto-Negotiation, 10Base-T, 10Base-TFD (full duplex), 100Base-TX, and 100Base-TXFD (full duplex). In normal operation, the port with a DELTX-UI installed is capable of auto-negotiating the operational mode and no further user setup is required. Section 5.23.3 describes how to configure a DELTX-UI.

Advertised Ability (Selectable)

During auto-negotiation, the DELTX-UI "tells" the device at the other end of the segment what its capabilities are. The capabilities of a port (1 or 2) with a DELTX-UI installed are 10BASE-T, 10BASE-TFD (full duplex mode), 100BASE-TX and 100BASE-TXFD (full duplex mode). In normal operation, with all capabilities enabled, the DELTX-UI "advertises" that it has the ability to operate in any mode. The Network Manager may choose to set up the port so that only a portion of the available capabilities are advertised and the others are disabled. For example, only 100BASE-TX and 100BASE-TXFD might be enabled so that only devices that operate at 100 Mbps can communicate with that port. Section 5.23.5 describes how to enable or disable advertised modes.

5.23.1 Configuring a DELTX-UI or DELF3-UI in Port 1 or 2

When a DELFX-UI or a DELF3-UI is installed in port 1 or 2, it must be manually set to operate in the same technology as the device at the other end of the connected segment. Section 5.23.2 provides instructions for manually configuring the port with a DELFX-UI or DELF3-UI interface.

5.23.2 Setting the DELFX-UI and DELF3-UI Desired Operational Mode

Use this field to set the active technology. This field toggles between 100Base-FX and 100Base-FXFD (full duplex). To set the active technology through Local Management, proceed as follows:

1. Use the arrow keys to highlight the **Desired Oper. Mode** field.

2. Use the SPACE bar to select **100Base-FX** or **100Base-FXFD** (full duplex).

3. Press ENTER. The port now operates in the chosen mode.

4. Use the arrow keys to highlight the **SAVE** command. Press ENTER. The message "SAVED OK" displays and Local Management saves the changes to memory.

5.23.3 Configuring a DELTX-UI in Port 1 or 2

In normal operation, a port (1 or 2) with a DELTX-UI interface automatically establishes a link with the device at the other end of the segment and no user setup is required. Section 5.23.4 and Section 5.23.5 provide instructions for manually configuring the port with a DELTX-UI installed.

5.23.4 Setting the DELTX-UI Desired Operational Mode

Use this field to set the active technology. This field toggles between Auto-Negotiation, 10Base-T, 10Base-TFD (full duplex), 100Base-TX, and 100Base-TXFD (full duplex). If Auto-Negotiation is selected, the DELTX-UI automatically sets the active technology. To manually set the active technology through Local Management, proceed as follows:

1. Use the arrow keys to highlight the **Desired Oper. Mode** field.

2. Use the SPACE bar to select the desired mode. Press ENTER. If any mode other than Auto-Negotiation is selected, the port only operates in the chosen mode and auto-negotiation is disabled.

3. Use the arrow keys to highlight the **SAVE** command. Press ENTER. The message "SAVED OK" displays and Local Management saves the changes to memory. The selected mode is displayed in both the Desired Operational Mode field and the Current Operational Mode field.

5.23.5   Setting the DELTX-UI Advertised Ability

In normal operation, a port (1 or 2) with a DELTX-UI auto-negotiates to the highest speed possible. Under some circumstances, the Network Administrator may want the port to advertise only some of the available modes and not operate in other modes. This field steps between 10Base-T, 10Base-TFD (full duplex), 100Base-TX, and 100Base-TXFD (full duplex). To set the advertised ability, proceed as follows:

1. Use the arrow keys to highlight the **Advertised Ability** field.

2. Use the SPACE bar to select the desired mode.

3. Use the RIGHT-ARROW key to move across to the **Enabled/Disabled** field to the right of the selection.

4. Use the SPACE bar to select **Enabled** or **Disabled**. Press ENTER. Continue this process until you have completed enabling or disabling the advertised modes.

5. Use the arrow keys to highlight the **SAVE** command. Press ENTER. Local Management saves the changes to memory.

5.24   FLASH DOWNLOAD SCREEN

The Flash Download screen, shown in Figure 5-28, allows the user to clear the information stored in the DLEHF-MA FLASH memory and download a new image file from a TFTP server. Before downloading a new image to the module, load the image onto the network TFTP server.

The user may also force the download of an image by changing the position of Switch 6 located inside the device. Refer to Section C.2 for details. If Switch 6 is toggled, the TFTP server must be located on a Fast Ethernet port.

For information on how to set up a workstation as a TFTP server, refer to the specific workstation documentation.

Boot PROM downloads (.hex) cannot be done through HSIM ports. If downloading through an HSIM, runtime download must be used. Firmware based downloads (.fls) can be done through any port.

To access the Flash Download screen from the Module Specific Configuration screen, use the arrow keys to highlight the **FLASH DOWNLOAD** menu item and press ENTER. The Flash Download screen displays.

```
 TFTP DOWNLOAD. WILL COMMIT TO FLASH. REBOOT IN PROGRESS...
                       MS 700 LOCAL MANAGEMENT

                            Flash Download
     Module Type: DLEHF-MA                Firmware Revision:    XX.XX.XX
     Slot Number: X                       BOOTPROM Revision: XX.XX.XX




                   Download Method:  [TFTP]
               Reboot After Download:  [YES]
               TFTP Gateway IP Addr:  134.141.79.123
               Last Image Server IP:  134.141.79.121
              Last Image File Name:  /tftpboot/6E128.hex
                Download Server IP:  134.141.79.121
              Download File Name:  /tftpboot/6M146.hex



     EXECUTE                    EXIT                      RETURN
```

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Figure 5-28   Flash Download Screen

Download Server IP and Download File Name are displayed only when TFTP or RUNTIME are selected in Download Method.

The following briefly explains each field of the Flash Download screen:

Download Method (Selectable)
This field toggles between TFTP, RUNTIME and BOOTP. If set for BOOTP, the module sends out a BootP request to determine the IP address of the TFTP server and the filename of the image to be downloaded. If set for TFTP or RUNTIME, the DLEHF-MA attempts a TFTP download based on the IP address and filename entered in the fields at the bottom of the Flash Download screen. Section 5.24.1 describes how to download using TFTP. Section 5.24.2 describes how to download using RUNTIME. Section 5.24.3 describes how to download using BootP.

Reboot After Download (Modifiable when **RUNTIME** is chosen only)
This field notifies the user that the DLEHF-MA will reboot after the
download is complete. If a RUNTIME Download is performed this field
toggles between YES and NO. If YES is selected, the module reboots
after the download is completed. If NO is selected the module will
continue using the existing the firmware image. The module stores the
new firmware image in FLASH memory. When the module or
DLM6C-AA chassis is reset, the module will boot from FLASH memory
using the new image.

TFTP Gateway IP Addr (Selectable)
This field shows the IP address of the TFTP gateway defined in the
General Configuration screen in Section 5.15.4.

Last Image Server IP (Read-only)
This field shows the IP address of the server used for the previous FLASH
Download.

Last Image File Name (Read-only)
This field shows the complete path and file name of the last image
downloaded to FLASH.

If TFTP or RUNTIME is selected as the download method (Figure 5-28),
the following two additional fields appear:

Download Server IP (Modifiable)
The IP address of the TFTP server to be used for the FLASH download is
entered in this field.

Download File Name (Modifiable)
The complete TFTP Server path and file name of the new image is entered
in this field.

5.24.1   Image File Download Using TFTP

Set the DLEHF-MA to download to FLASH using TFTP as follows:

1. Use the arrow keys to highlight the **Download Method** field.

2. Use the SPACE bar to select **TFTP**.

3. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.

4. Set the IP address of the TFTP gateway server (this defaults to the same IP address as that set in the TFTP Gateway IP Addr field on the General Configuration screen).

5. Use the arrow keys to highlight the **Download Server IP** field.

6. Enter the IP address of the TFTP server using the DDN format.

   For example: 134.141.79.121

7. Use the arrow keys to highlight the **Download File Name** field.

8. Enter the complete path and file name of the image stored on the download server.

   For example: /tftpboot/6M146.hex

9. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen and press ENTER. The message "TFTP DOWNLOAD. WILL COMMIT TO FLASH. REBOOT IN PROGRESS..." displays in the event message line at the top of the screen and the new image is downloaded into FLASH memory.

5.24.2   Image File Download Using RUNTIME

Set the DLEHF-MA to download to FLASH using RUNTIME as follows:

1. Use the arrow keys to highlight the **Download Method** field.

2. Use the SPACE bar to select **RUNTIME**.

3. Use the arrow keys to highlight the **Reboot After Download** field.

4. Use the SPACE bar to select either **YES** or **NO**. Select **YES** if you want the module to reboot after the download is completed. Select **NO** if you want the module to store the new image in FLASH memory until the module is manually reset.

5. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.

6. Set the IP address of the TFTP gateway server (this defaults to the same IP address as that set in the TFTP Gateway IP Addr field on the General Configuration screen).

7. Use the arrow keys to highlight the **Download Server IP** field.

8. Enter the IP address of the TFTP server using the DDN format.

    For example: 134.141.79.121

9. Use the arrow keys to highlight the **Download File Name** field.

10. Enter the complete path and file name of the image stored on the download server.

    For example: /tftpboot/6M146.fls

11. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen and press ENTER. The message "RUNTIME DOWNLOAD. WILL COMMIT TO FLASH." displays in the event message line at the top of the screen and the new image is downloaded into FLASH memory.

5.24.3   Image File Download Using BootP

Set the DLEHF-MA to download to FLASH using BootP as follows:

1. Use the arrow keys to highlight the **Download Method** field.

2. Use the SPACE bar to select **BOOTP**.

3. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.

4. Set the IP address of the TFTP gateway server (this defaults to the same IP address set in the TFTP Gateway IP Addr field in the General Configuration screen).

5. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen and press ENTER. The message "BOOTP DOWNLOAD. WILL COMMIT TO FLASH. REBOOT IN PROGRESS..." displays in the event message line at the top of the screen and the new image is downloaded into FLASH memory.

5.25 PORT REDIRECT FUNCTION SCREEN

The Port Redirect Function screen may only be used if the operational mode of one or more modules has been set to 802.1D SWITCHING. Refer to the Release Notes to verify which operational modes support the Port Redirect Function screen.

The Port Redirect Function screen, Figure 5-29, allows the user to set each one of the ports on the DLEHF-MA as a source or destination port. A port can be set to have one or more destination ports. For example, port 1 can be set as a source port with three destinations, ports 2, 3, and 4. Traffic from port 1 is then automatically redirected to ports 2, 3, and 4. Port 1 can also serve as a destination port for other ports. The port redirect function is extremely useful for troubleshooting purposes, as it allows traffic to be sent to a particular port(s) where, with the use of an analyzer or RMON probe, all current traffic from the source port(s) can be examined.

Although all traffic from the source port (including, if desired, errored frames) is sent to the destination port, normal switching is still performed for all frames on the source port.

To access the Port Redirect Function screen from the Module Specific Configuration screen, use the arrow keys to highlight the **PORT REDIRECT FUNCTION** menu item and press ENTER. The Port Redirect Function screen displays.
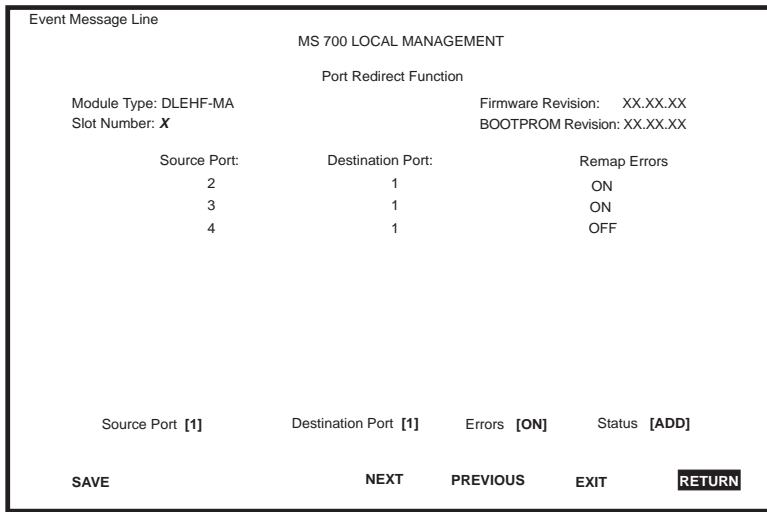
```
Event Message Line

                          MS 700 LOCAL MANAGEMENT

                            Port Redirect Function

      Module Type: DLEHF-MA                    Firmware Revision:    XX.XX.XX
      Slot Number: X                           BOOTPROM Revision: XX.XX.XX

              Source Port:        Destination Port:          Remap Errors
                  2                       1                      ON
                  3                       1                      ON
                  4                       1                      OFF




              Source Port [1]      Destination Port [1]    Errors [ON]    Status [ADD]

      SAVE                              NEXT      PREVIOUS      EXIT       RETURN
```

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Figure 5-29   Port Redirect Function Screen

The following definitions briefly explain each field of the Port Redirect
Function screen:

Source Port (Read-only)
Shows which ports are currently set as source ports.

Destination Port (Read-only)
Shows which ports are currently set as destination ports.

Remap Errors (Read-only)
Shows whether destination ports are receiving errored frames and valid
traffic (ON) or just valid traffic (OFF).

Source Port [*n*] (Selectable)
Allows a selected port [*n*] to be changed to a source port.

Destination Port [*n*] (Selectable)
Allows a selected port [*n*] to be changed to a destination port.

Errors (Toggle)

Allows the user to configure the source ports to either send errored frames and valid traffic to selected destination ports (ON), or to drop errored frames, and send only valid traffic to the destination ports (OFF). The default setting of this field is ON.

Status (Selectable)

Allows you to add or delete the source and destination ports selected in the Source Port [*n*] and Destination Port [*n*] fields.

5.25.1   Displaying the Source and Destination Entries

There can be more than one Port Redirect Function screen depending on the number of port redirect entries. Each screen displays up to 10 port redirect entries. If there is more than one screen of redirect entries, the **NEXT** and/or **PREVIOUS** command is displayed at the bottom of the screen, allowing the user to navigate to either the next or previous screen.

5.25.2   Changing Source and Destination Ports

Add or delete source port and destination port entries as follows:

1. Use the arrow keys to highlight the **Source Port** field.

2. Press the SPACE bar or BACKSPACE one or more times to increment or decrement the port number displayed in the brackets [*n*] until the appropriate port number is displayed.

3. Use the arrow keys to highlight the **Destination Port** field.

4. Use the SPACE bar or BACKSPACE to step to the appropriate port number for the destination interface.

5. Use the arrow keys to highlight the **Errors** field.

6. Use the SPACE bar to toggle between the **ON** and **OFF** settings. Press ENTER. **ON** forces the source module and port to forward errored frames and valid traffic to the destination module(s) and port(s). **OFF** suppresses errored frames from being sent to the destination module(s) and port(s), and only allows valid traffic to pass to the destination module(s) and port(s).

7. Use the arrow keys to highlight the **Status** field.

8. Use the SPACE bar to toggle between the **ADD** and **DEL** (delete) settings. Press ENTER. This adds or deletes the port selections made in steps 2 and 4 and also updates the screen Source Port and Destination Port list.

> If more than one port is to be redirected, repeat steps 1 through 8 for each additional setting, then go to step 9 to save all the new settings at once.

9. Use the arrow keys to highlight **SAVE** at the bottom of the screen. Press ENTER. The message "SAVED OK" is displayed. This saves the new settings and updates the Source Port and Destination Port read-only fields.
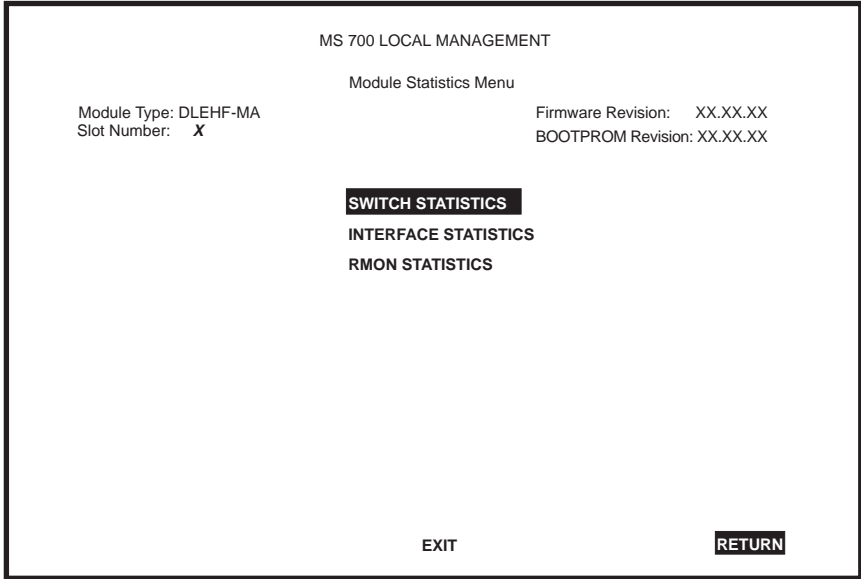
5.26 BROADCAST SUPPRESSION SCREEN

> The Broadcast Suppression screen displays only if the operational mode of the chassis or the DLEHF-MA has been set to 802.1D SWITCHING or 802.1Q SWITCHING. Refer to Section 5.7.7, for instructions on configuring the chassis to operate in this mode and Section 5.15.9, for instructions on configuring the DLEHF-MA to operate in this mode.

The Broadcast Suppression screen, Figure 5-30, allows the user to set a desired limit of receive broadcast frames per port per second. Any broadcast frames received above the desired threshold, during the one second period of time, will be dropped.

Access the Broadcast Suppression screen from the Module Specific Configuration screen by using the arrow keys to highlight the **BROADCAST SUPPRESSION** menu item and then pressing ENTER. The Broadcast Suppression screen displays.

```
Event Message Line
                          MS 700 LOCAL MANAGEMENT

                          Broadcast Suppression

        Module Type: DLEHF-MA                 Firmware Revision:    XX.XX.XX
        Slot Number: X                        BOOTPROM Revision: XX.XX.XX

   Port #    Total RX      Peak Rate     Time Since Peak    Threshold    Reset Peak
     1     12345678910     150000         999:23:59          150000        [NO]
     2     12345678910     150000         999:23:59          150000        [NO]
     3     12345678910     150000         999:23:59          150000        [NO]
     4     12345678910     150000         999:23:59          150000        [NO]




            SAVE                    EXIT                      RETURN

                                                              236237
```

Figure 5-30   Broadcast Suppression Screen

The following explains each field of the Broadcast Suppression screen:

Port # (Read-only)
Identifies the number of the port.

Total RX (Read-Only)
Displays the total number of broadcast frames received.

Peak Rate (Read-Only)
Displays the number of broadcast frames received per second.

Time Since Peak (Read-Only)
Displays the time since peak broadcast frames received.

Threshold (Modifiable)
Allows the user to set the desired limit of receive broadcast frames that will be forwarded per port per second.

Reset Peak (Toggle)

Allows the user to reset the Peak Rate field. Resetting the peak rate also resets the Time Since Peak field. The Reset Peak field toggles between YES and NO.

5.26.1   Setting the Threshold

To set the Threshold, proceed as follows:

1. Use the arrow keys to highlight the **Threshold** field for the selected port.

2. Type in the numbers for the desired limit in increments of 10. Press ENTER.

3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.

4. Press ENTER. The message "SAVED OK" is displayed.

5.26.2   Resetting the Peak Rate

To reset the Peak Rate field to zero, proceed as follows:

1. Use the arrow keys to highlight the **Reset Peak** field for the selected port.

2. Press the SPACE bar to select **YES**.

3. Use the arrows keys to highlight the **SAVE** command at the bottom of the screen.

4. Press ENTER. The message "SAVED OK" is displayed.

5.27   MODULE STATISTICS MENU SCREEN

The Module Statistics Menu screen, Figure 5-31, provides access to screens that allow the user to obtain switch statistics about frame traffic through each interface, to view MIB-II statistics from each interface, and to view RMON Statistics gathered by the RMON agent embedded in the DLEHF-MA.

To access the Module Statistics Menu from the Module Menu screen, use the arrow keys to highlight the **MODULE STATISTICS** menu item and press ENTER. The Module Statistics Menu screen displays.

The Switch Statistics menu item displays only if the operational mode of the chassis or the DLEHF-MA has been set to 802.1D SWITCHING or 802.1Q SWITCHING. Refer to Section 5.7.7 for instructions on configuring the chassis to operate in this mode and Section 5.15.9 for instructions on configuring the DLEHF-MA to operate in this mode.

MS 700 LOCAL MANAGEMENT

Module Statistics Menu

Module Type: DLEHF-MA
Slot Number: **X**

Firmware Revision: XX.XX.XX
BOOTPROM Revision: XX.XX.XX

SWITCH STATISTICS

INTERFACE STATISTICS

RMON STATISTICS

EXIT

RETURN

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Figure 5-31   Module Statistics Menu Screen

The Module Statistics Menu screen displays the following items:

SWITCH STATISTICS
The Switch Statistics screen lists the number of frames received, transmitted, filtered, and forwarded by each interface. For details, refer to Section 5.28.

INTERFACE STATISTICS
The Interface Statistics screen provides the MIB-II statistics for each switched interface, on an interface-by-interface basis. For details, refer to Section 5.29.

RMON STATISTICS

The RMON Statistics screen displays all the statistics gathered by the embedded RMON agent built-in to the DLEHF-MA. For details, refer to Section 5.30.

5.28 SWITCH STATISTICS SCREEN

The Switch Statistics screen displays only if the operational mode of the chassis or the DLEHF-MA has been set to 802.1D SWITCHING or 802.1Q SWITCHING. Refer to Section 5.7.7 for instructions on configuring the chassis to operate in this mode and Section 5.15.9, for instructions on configuring the DLEHF-MA to operate in this mode.

Ports 5 through 8 represent the backplane connections that the DLEHF-MA has with the DLM6C-AA chassis. The module has a direct connection to every other slot in the chassis.

The Switch Statistics screen, Figure 5-32, lists the number of frames received, transmitted, filtered, and forwarded by each interface, including backplane interfaces.

To access the Switch Statistics screen from the Module Statistics Menu screen, use the arrow keys to highlight the **SWITCH STATISTICS** menu item and press ENTER. The Switch Statistics screen displays.

```
Event Message Line
                        MS 700 LOCAL MANAGEMENT

                          Switch Statistics

     Module Type: DLEHF-MA                    Firmware Revision:    XX.XX.XX
     Slot Number: X                           BOOTPROM Revision: XX.XX.XX

     Port #          Frames Rcvd      Frames Txmtd      Frames Fltrd    Frames Frwded
            1            100              100               0               100
            2            100              100               0               100
            3            100              100               0               100
            4            100              100               0               100
            5            100              100               0               100
            6            100              100               0               100
            7            100              100               0               100
            8            100              100               0               100




                 CLEAR COUNTERS                   EXIT            RETURN
```

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Figure 5-32   Switch Statistics Screen

The Switch Statistics screen displays the following items:

Port # (Read-Only)
Identifies the interface or port number.

Frames Rcvd (Read-Only)
Displays the number of frames received by the interface.

Frames Txmtd (Read-Only)
Displays the number of frames transmitted by the interface.

Frames Fltrd (Read-Only)
Displays the number of frames filtered by the interface.

Frames Frwded (Read-Only)
Displays the number of frames forwarded by the interface.

CLEAR COUNTERS (Command)
This command is used to reset all statistic counters to zero. For details on
how to use this field, refer to Section 5.28.1.

5.28.1 Using the Clear Counters Command

To reset all the statistics counters to zero, perform the following steps:

1. Use the arrow keys to highlight the **CLEAR COUNTERS** field.

2. Press ENTER, the counters for the selected interface are reset to zero.

5.29   THE INTERFACE STATISTICS SCREEN

The Interface Statistics screen is used to gather MIB-II statistics for the DLEHF-MA Fast Ethernet Interface Modules and all backplane interfaces.

> DIGITAL HSIMs gather their own statistics, and may be viewed via the Local Management screens of the applicable HSIM. Refer to your HSIM documentation for information on how to access these screens.

To access the Interface Statistics screen, use the arrow keys to highlight the **INTERFACE STATISTICS** menu item on the Module Statistics Menu screen and press ENTER. The Interface Statistics screen, Figure 5-33, displays.

```
Event Message Line
                           MS 700 LOCAL MANAGEMENT

                              Interface  Statistics
      Module Type: DLEHF-MA                          Firmware Revision:    XX.XX.XX
      Slot Number: X                                 BOOTPROM Revision: XX.XX.XX

      Interface: 1          Name:  Fast Ethernet Frontpanel

   InOctets:                  7500456     Address:          00-00-00-00-00-00
   InUnicast:                    6789     Last Change:      xx days 00:00:00
   InNonUnicast:                    0     Admin Status:     Up
   InDiscards:                      0     Oper Status:      Down
   InErrors:                        0
   InUnknownProtos:                 0     MTU:              1514
   OutOctets:                       0     Speed:            100000000
   OutUnicast:                      0
   OutNonUnicast:                   0
   OutDiscards:                     0     Link Status:      No Link
   OutErrors:                       0     Duplex Mode:      Standard
   OutQLen:                         0

       Interface: [ 1]          CLEAR COUNTERS      EXIT         RETURN
```

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Figure 5-33   Interface Statistics Screen

The following definitions explain each field of the Interface Statistics screen:

Interface (Read-only)
This field displays the interface number for which statistics are currently being displayed. Figure 5-33 shows the Interface field displaying 1. This represents port 1 of the module. To view other interface statistics, refer to Section 5.29.1.

Name (Read-only)
The Name field displays the type of interface for which statistics are being displayed.

InOctets (Read-only)
This field displays the total number of octets (bytes) that have been received on the interface. This includes all octets from bad frames.

InUnicast (Read-only)
The InUnicast field displays the total number of frames received that had a unicast destination address.

InNonUnicast (Read-only)
This field displays the total number of frames received that had a broadcast or multicast destination address.

InDiscards (Read-only)
The InDiscards field displays the total number of inbound frames that were discarded, even though the frames contained no errors. This field may increment because the switch needed to free up buffer space, or the switch was being overutilized.

InErrors (Read-only)
This field displays the total number of inbound frames that have been discarded because they contained errors. This field represents the total number of errored frames, regardless of the cause of the error.

InUnknownProtos (Read-only)
The InUnknownProtos field displays the total number of frames that were discarded because the frames were in an unknown, or unsupported, format.

OutOctets (Read-only)
This field displays the total number of octets (bytes) that have been transmitted from the Interface. This includes all Frame Check Sequence (FCS) octets.

OutUnicast (Read-only)
The OutUnicast field displays the total number of frames transmitted that were sent to a single address.

OutNonUnicast (Read-only)
This field displays the total number of frames transmitted to a broadcast or multicast address.

OutDiscards (Read-only)
The OutDiscards field displays the total number of outbound frames that were discarded, even though the frames contained no errors. This field may increment, because the switch needed to free up buffer space, or the switch was being overutilized.

OutErrors (Read-only)
This field displays the total number of outbound frames discarded because they contained errors. This field represents the total number of errored frames, regardless of the cause of the error.

OutQLen (Read-only)
The OutQLen field displays the length of the frame queue. This field represents the capacity of the queue.

Address (Read-only)
This field displays the MAC Address of the interface that is currently being displayed.

Last Change (Read-only)
This field displays the last time that the interface was reset.

Admin Status (Read-only)
This field displays the current status of the interface. If this field displays **Testing**, no frames may be passed on this interface.

Oper Status (Read-only)
This field displays the current status of the interface. If this field displays **Testing**, no frames may be passed on this interface.

MTU (Read-only)
The maximum transmission unit (MTU) field displays the maximum data field size (in octets) that a frame may contain to be received or transmitted from this interface.

Speed (Read-only)
The Speed field displays the interface's theoretical maximum bandwidth in bits per second.

Link Status (Read-only)
This field displays the current link status of the interface. This field will read either Link or No Link.

Duplex Mode (Read-only)
This field indicates whether the interface is operating in normal or full duplex mode. This field will read either Standard or Full Duplex.

Interface [*nn*] (Command)
This command is used to enter an interface number for viewing statistics.
For instructions on how to use this command, refer to Section 5.29.1.

CLEAR COUNTERS (Command)
This command is used to reset all statistic counters to zero. For details on
how to use this field, refer to Section 5.29.2.

5.29.1   Displaying Interface Statistics

To display the statistics for any interface, proceed as follows:

1. Use the arrow keys to highlight the **Interface [*nn*]** field at the bottom
    of the screen.

2. Press the SPACE bar to increment (or press the DEL [delete] key to
    decrement) the interface number.

3. Press ENTER (neither the **Interface #** fields nor the statistics will
    change until ENTER is pressed).

5.29.2   Using the Clear Counters Command

To reset all the statistics counters of the selected interface to zero, perform
the following steps:

1. Use the arrow keys to highlight the **CLEAR COUNTERS** field.

2. Press ENTER, the counters for the selected interface are reset to zero.

5.30   RMON STATISTICS SCREEN

RMON statistics for each Fast Ethernet Interface Module, on a
interface-by-interface basis, are viewed through the RMON Statistics
screen shown in Figure 5-34.

To access the RMON Statistics screen, use the arrow keys to highlight the
RMON STATISTICS menu item on the Module Statistics Menu screen
and press ENTER. The RMON Statistics screen displays.

```
Event Message Line
                              MS 700 LOCAL MANAGEMENT

                                 RMON  Statistics
          Module Type: DLEHF-MA                     Firmware Revision:    XX.XX.XX
          Slot Number: X                            BOOTPROM Revision: XX.XX.XX

          RMON Index:    1                    Owner:   monitor
          Data Source:    IfIndex.1           Status:    valid

          Drop Events:                 0      Total Packets:             0
          Collisions:                  0      Total Octets:              0
          Broadcast Pkts:              0      64 Octets:                 0
          Multicasts:                  0      65   -   127 Octets:       0
          CRC Align Errors:            0      128   -   255 Octets:      0
          Undersized Pkts:             0      256   -   511 Octets:      0
          Oversized Pkts:              0      512   -   1023 Octets:     0
          Fragments:                   0      1024  -   1518 Octets:     0
          Jabbers:                     0


            Index:  [ 1 ]         CLEAR COUNTERS        EXIT        RETURN

                                                                  236241
```

Figure 5-34   RMON Statistics Screen

The following definitions explain each field of the RMON Statistics screen:

RMON Index (Read-only)
This field displays the current Fast Ethernet interface for which statistics are being shown. The DLEHF-MA has an embedded RMON agent that gathers statistics for each interface on the module.

Data Source (Read-only)
This field displays the source of the statistics data that is currently being displayed on the screen. Figure 5-34 shows that the data source for this RMON index is Interface 1 (port 1) by displaying the name IfIndex.1. If the screen was displaying RMON statistics for Interface 2 (port 2), the name displayed would be IfIndex.2.

Owner (Read-only)
This field displays the name of the entity that last configured the device.

Status (Read-only)
The Status field displays the current operating status of the displayed interface. This field will display "valid" or "invalid".

Drop Events (Read-only)

This field displays the total number of times that the RMON agent was forced to discard frames due to the lack of available switch resources.

> The Drop Events field does not display the number of frames dropped, it only displays the number of times that the RMON agent was forced to discard frames.

Collisions (Read-only)

This field displays the total number of collisions that have occurred on this interface.

Broadcast Pkts (Read-only)

The Broadcast Pkts field displays the total number of good frames that were directed to the broadcast address. The value of this field does not include multicast frames.

Multicasts (Read-only)

The Multicast Pkts field displays the total number of good frames received that were directed to a multicast address. The value of this field does not include frames directed to the broadcast address.

CRC Align Errors (Read-only)

This field displays the number of frames with bad Cyclic Redundancy Checks (CRC) received from the network. The CRC is a 4-byte field in the data frame that ensures that the data received is the same as the data that was originally sent.

Undersized Pkts (Read-only)

This field displays the number of frames received whose size was less than the minimum Ethernet frame size of 64 bytes, not including preamble, but have a valid CRC.

Oversized Pkts (Read-only)

This field displays the number of frames received whose size exceeded 1518 data bytes, not including preamble, but have a valid CRC.

Fragments (Read-only)
This field displays the number of received frames that are not the minimum number of bytes in length or received frames that had a bad Frame Check Sequence (FCS), were less than 64 bytes in length (excluding framing bits, but including FCS bytes), and have an invalid CRC.

> It is normal for the Fragments field to increment. This is because the RMON agent increments the field when runts (undersized frames) are detected (which are normal occurrences due to collisions) and when noise hits occur.

Jabbers (Read-only)
This field displays the total number of frames that were greater than 1518 bytes and had either a bad FCS or a bad CRC.

Total Packets (Read-only)
This field displays the total number of frames (including bad frames, broadcast frames, and multicast frames) received on this interface.

Total Octets (Read-only)
This field displays the total number of octets (bytes) of data, including those in bad frames, received on this interface.

64 Octets (Read-only)
Displays the total number of frames, including bad frames, received that were 64 bytes in length (excluding framing bits, but including FCS bytes).

65 - 127 Octets (Read-only)
Displays the total number of frames, including bad frames, received that were between 65 and 127 bytes in length (excluding framing bits, but including FCS bytes).

128 - 255 Octets (Read-only)
Displays the total number of frames, including bad frames, received that were between 128 and 255 bytes in length (excluding framing bits, but including FCS bytes).

256 - 511 Octets (Read-only)

Displays the total number of frames, including bad frames, received that were between 256 and 511 bytes in length (excluding framing bits, but including FCS bytes).

512 - 1023 Octets (Read-only)

Displays the total number of frames, including bad frames, received that were between 512 and 1023 bytes in length (excluding framing bits, but including FCS bytes).

1024 - 1518 Octets (Read-only)

Displays the total number of frames, including bad frames, received that were between 1024 and 1518 bytes in length (excluding framing bits, but including FCS bytes).

Index [*nn*] (Command)

This command is used to enter an index number for viewing statistics. For instructions on how to use this command, refer to Section 5.30.1.

CLEAR COUNTERS (Command)

This command is used to reset all statistic counters to zero. For details on how to use this field, refer to Section 5.30.2.

5.30.1   Displaying RMON Statistics

To display the statistics for any index, proceed as follows:

1. Use the arrow keys to highlight the **Index [*nn*]** field at the bottom of the screen.

2. Press the SPACE bar to increment or press the DEL (delete) key to decrement the index number.

3. Press ENTER (neither the RMON Index # field, the Data Source field, nor the statistics will change until ENTER is pressed).

5.30.2   Using the Clear Counters Command

To reset all the statistics counters of the selected interface to zero, perform the following steps:

1. Use the arrow keys to highlight the **CLEAR COUNTERS** field.

2. Press ENTER, the counters for the selected index are reset to zero.

5.31   NETWORK TOOLS

The Network Tools function resides on the DLEHF-MA and allows the user to access and manage network devices.

To access the Network Tools Help screen, use the arrow keys to highlight the **NETWORK TOOLS** menu item in the Module Menu screen and press ENTER. Type in the word **help** at the **->** prompt and press ENTER. The Network Tools screen shown in Figure 5-35 displays.

```
Welcome to Network Tools

-> help

  Commands Available to User

    Built in Commands:

    arp              bridge          defroute
    netstat          ping            reset
    show             traceroute

    soft_reset      telnet          link_trap

    atm_stp_state
    SPECIAL:
        done, quit, or exit - Exit from the Network Tools.
        For help with a specific command, type 'help <command>'.
->
```

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Figure 5-35   Network Tools Help Screen

The Network Tools functions are performed using a series of commands. Entering commands in Network Tools involves typing the command to be executed at the Network Tools prompt, adding any desired or required extensions, and pressing ENTER.

There are two categories of commands in the command set.

- Built-in Commands – Allow the user to access and manage network devices. The commands are **arp**, **bridge**, **defroute**, **link_trap**, **netstat**, **ping**, **reset**, **show**, **soft-reset**, **telnet**, **traceroute**, and **atm_stp_state**.

- Special Commands – Allow the user to exit from Network Tools. The commands are **done**, **exit**, and **quit**.

The conventions used in describing the commands in Network Tools are as follows:

Arguments enclosed by [ ] are required.

Arguments enclosed by < > are optional.

Information entered by user is in shown in **this Helvetica font**.

To abort the output or interrupt a process, press the CONTROL key and c key simultaneously, designated as ^C here.

The commands are presented in the following format:

command:

Syntax:	Shows the required command format. It indicates where arguments, if any, must be specified
Description:	Briefly describes the command and its uses.
Options:	Lists any additional fields in the appropriate format which may be added to the command.
Example:	Shows an example of the command.

5.31.1   Built-in Commands

The built-in commands listed in this section activate functions on the managed device or devices being accessed through Network Tools.

arp:

Syntax:	arp [options]
Description:	The arp command provides access to the ARP (Address Resolution Protocol) cache, enabling you to view cache data, delete entries, or add a static route. Super-User access is required to delete an entry or add a static route.

Each ARP cache entry lists the network *interface* that the device is connected to, the device's *network address* or IP address, the device's *physical address* or MAC address, and the *media type* of connection to the device. Media types are displayed as numbers, which stand for the following states:

1 - Other
2 - Invalid entry (cannot ping device, timed out, etc.)
3 - Dynamic route entry
4 - Static route entry (not subject to change)

You can specify the arp command with one of the following options:

Options: **-a** Views cache data
-d Deletes an IP address entry. Requires additional arguments: [Interface Number] [IP address]
-s Adds a static entry. Requires additional arguments: [Interface Number] [IP address] [MAC address]
-f Flushes the ARP cache

Example:

```
-> arp -a
# Interface        Network Address      Physical Address      Media Type
# 31               122.144.40.111       00.00.0e.12.3c.04     3(dynamic)
# 2                122.144.48.109       00.00.0e.f3.3d.14     3(dynamic)
# 4                122.144.52.68        00.00.0e.12.3c.04     3(dynamic)
# 5                122.144.21.43        00.00.0e.03.1d.3c     3(dynamic)


-> arp -d 1 122.144.52.68


-> arp -s 1 22.44.2.3 00:00:0e:03:1d:3c


-> arp -f
```

236243

bridge:

Syntax:	bridge [enable/disable] [ifnum/all]
Description:	The bridge command allows bridge management to be enabled or disabled at the user's request, either one at a time or all at once. Specifying a single interface number will affect the bridging status of that interface, while specifying ALL will affect every interface.
Options:	Not Applicable
Example:	

```
-> bridge disable all

-> bridge enable 1

-> bridge disable 1
```

236245

defroute:

Syntax: defroute [interface number] [IP address]

Description: The defroute command allows the user to view, set or delete the default IP route to a managed device through the specified interface.

Options: Not Applicable

Example:

```
-> defroute 2 147.152.42.32
```

051469

link_trap:

Syntax: link_trap [enable/disable/status][PORT/all]

Description: The link_trap command allows link traps to be enabled or disabled either one port at a time or all ports at once. Specifying a single port number will affect only that port, while specifying ALL will affect every port. The

current status of a single port, or all ports, can also be shown.

Options: Not Applicable

Example:

```
-> link_trap status
LINK TRAP STATUS:

  Port 1  is ENABLED          Port 2  is DISABLED
  Port 3  is ENABLED          Port 4  is ENABLED

-> link_trap disable 2
Link traps have been DISABLED on port 2

-> link_trap disable all
Link traps have been DISABLED on all ports (1-4)

-> link_trap status 3
Link traps are ENABLED on port 3
```

236247

netstat:

Syntax: netstat [option]

Description: The netstat command provides a display of general network statistics for the managed device. The netstat command must be used with one of the two display options.

Options: **-i** Displays status and capability information for each interface

                          -r Displays routing information for each interface

Example:

```
-> netstat -i
Interface + Description      MTU      Speed      Admin  Oper  MAC Addr

# 1 (ethernet -csmacd)      1514     10000000   up     up    0x00 0x00 0x1d 0x07 0x50 0x0e
# 2 (ethernet - csmacd)     1514     10000000   up     up    0x00 0x00 0x1d 0x07 0x50 0x0f



-> netstat -r
Destination             Next-hop                    Interface

# Default Route         DirectConnection            1
# 134.141.0.0           DirectConnection            2
# 134.141.0.0           DirectConnection            3
```

236248

ping:

Syntax: ping [IP address]

Description: The ping command generates an outbound ping request to check the status (alive/not alive) of a device at a specified IP address.

Options: Not Applicable

Example:

```
-> ping 122.144.40.10
122.144.40.10 is alive
```

236249

reset:

Syntax: reset

Description: The reset command allows a soft reset of the device. It also initializes the CPU, runs the onboard diagnostics, and restarts the software image, which restores the user configuration settings from NVRAM. The user will be queried to confirm the reset command to ensure against unwanted resets.

⚠ The Network Tools connection to the module will be terminated upon execution of this command.

Options: Not Applicable

Example:show:

```
 -> reset
RESET: Are you *SURE*? ->Y
```

236250

```
 -> reset
RESET: Are you *SURE*? ->Y
```

236250

show:

Syntax:	show [protocol] [table]
Description:	The show command displays information concerning various components of the device. Protocols currently supported are IP, IPX, DECnet, and AppleTalk. Components of those protocols that are currently supported are ARP caches, route tables, FIB tables, server tables, and interface tables. The number of valid entries in the table will be displayed at the end of the table display.
Options:	Not Applicable
Example:	

```
-> show Appletalk interfaces

# Interface   AdminStatus   OperStatus   MTU    Forwarding   Framing
# 1           enabled       enabled      1500   enabled      ethernet
# 2           disabled      disabled     1500   disabled     ethernet



 -> show IP ARP

# Interface   MediaType     PhysicalAddress      NetworkAddress
# 3           3 (dynamic)   00:00:1d:04:40:5d    123.456.40.1
# 4           3 (dynamic)   08:00:20:0e:d8:31    123.456.40.30
#
# Number of valid entries: 2
```

236251

soft-reset:

| **Syntax:** | soft-reset |
| **Description:** | This command restarts the software image, which restores the user configuration settings from NVRAM. The user will be queried to confirm the reset command to ensure against unwanted resets. |

⚠️ The Network Tools connection to the module will be terminated upon execution of this command.

| **Options:** | Not Applicable |

Example:

```
-> soft-reset
RESET: Are you *SURE* -> Y
```

236252

telnet:

Syntax:	telnet [IP address] [Port #]
Description:	The telnet command allows the user to communicate with another host (that supports Telnet connections) using the Telnet protocol. The user must specify the remote host using its IP address. The [IP address] field is mandatory. If no Port number is specified, telnet will attempt to contact the host at the default port.
Options:	Not Applicable
Example:	

```
-> telnet 134.141.12.345
Trying 134.141.12.345
Connected to 134.141.12.345

SunOS UNIX (server1)


login:
```

236253

traceroute:

Syntax:	traceroute [IP address]
Description:	The traceroute command generates a TRACEROUTE request to a specified IP address and provides a display of all next-hop routers in the path to the device. If the device is not reached, the command displays all next-hop routers to the point of failure.
Options:	Not Applicable

Example:

```
 -> traceroute 122.144.11.52

# next-hop[0] : 122.144.60.45
# next-hop[1] : 122.144.8.113
# next-hop[2] : 122.144.61.45
# 122.144.11.52 is alive : 3 hops away.
```

236254

atm_stp_state:

> The atm_stp_state command is only available if a DELHA-UA is installed in the module.

Syntax:	atm_stp_state [STATE]
Description:	The atm_stp_state command allows the user to enable, disable, or check the status of the Spanning Tree Algorithm on all ATM interfaces. The user must specify the STATE option as enable, disable, or status. The STATE field is mandatory.
Options:	enable, disable, status

Example:

```
-> atm_stp_state status
Atm Stp is Enabled
-> atm_stp_state disable
-> atm_stp_state enable
```

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5.31.2   Special Commands

done, quit, exit:

Syntax:	done , quit, or exit
Description:	The done command enables the user to exit from Network Tools and return to the Main Menu screen.
Options:	Not Applicable
Example:	

```
-> done
```

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APPENDIX A

SPECIFICATIONS

This appendix provides operating specifications for the DIGITAL DLEHF-MA Interface Module. Cabletron Systems reserves the right to change these specifications at any time without notice.

A.1   DEVICE SPECIFICATIONS

Processor:	Intel i960 RISC processor control
Dynamic Random Access Memory (DRAM):	20 MB
FLASH Memory:	4 MB

A.2   PHYSICAL PROPERTIES

Dimensions:	43.87 H x 5.71 W x 27.88 D (cm)
	18.28 H x 2.38 W x 11.62 D (in)
Weight (Unit):	1.81 kg (4 lb)
MTBF (Predicted):	200,000 hours

A.3   ENVIRONMENTAL REQUIREMENTS

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

A.4   INPUT/OUTPUT PORTS

The input/output port specifications for the DELHF-MA are as follows:

Slots for optional Fast Ethernet Interface Modules (ports 1 and 2)	Accept three types of optional Fast Ethernet Interface Modules: DELTX-UI, DELFX-UI, and DELF3-UI.
Slots for optional HSIMs	Accept optional High Speed Interface Module (HSIM)

A.5   COM PORT PINOUT ASSIGNMENTS

The COM port is a serial communications port that supports Local Management or connection to a UPS.

The COM port has the following pin assignments:

Table A-1   COM Port Pin Assignments

Pin	Signal Name	Input/Output
1	Transmit Data (XMT)	Output
2	Data Carrier Detect (DCD)	Output
3	Data Set Ready (DSR)	Input
4	Receive Data (RCV)	Input
5	Signal Ground (GND)	NA
6	Data Terminal Ready (DTR)	Output
7	Request to Send (RTS)	Input
8	Clear to Send (CTS)	NA

A.6   REGULATORY COMPLIANCE

Safety
The DELHF-MA meets the safety requirements of UL 1950, CSA C22.2 No. 950, EN 60950, 73/23/EEC, and IEC 950.

Electromagnetic Compatibility (EMC)
The DELHF-MA meets the requirements of EN 50082-1, FCC Part 15, VCCI V-3, CSA C108.8, 89/336/EEC, and EN 55022.

APPENDIX B

DELTX-UI, DELFX-UI AND DELF3-UI SPECIFICATIONS

The DLEHF-MA supports three Fast Ethernet Interface Modules:

• DELTX-UI

• DELFX-UI

• DELF3-UI

This appendix provides the specifications for these modules.

B.1   DELTX-UI

The DELTX-UI uses an RJ45 connector supporting Category 5 Unshielded Twisted Pair (UTP) cabling with an impedance between 85 and 111 ohms.

The slide switch on the DELTX-UI determines the crossover status of the cable pairs. If the switch is on the **X** side, the pairs are internally crossed over. If the switch is on the **=** side, the pairs are not internally crossed over. Figure B-1 shows the pinouts for the DELTX-UI in both positions.

Position =
(not crossed over)

Position X
(crossed over)

1. TX+ 5. NC
2. TX- 6. RX-
3. RX+ 7. NC
4. NC   8. NC

= ■ x   10
         100
DELTX-UI

1. RX+ 5. NC
2. RX- 6. TX-
3. TX+ 7. NC
4. NC   8. NC

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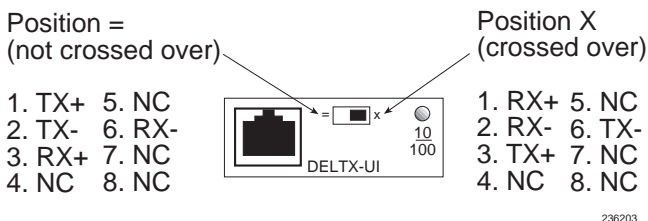
Figure B-1   DELTX-UI Pinouts

B.2   DELFX-UI

The DELFX-UI shown in Figure B-2 uses an SC style connector that supports multimode fiber optic cabling. Specifications for the DELFX-UI are listed below.

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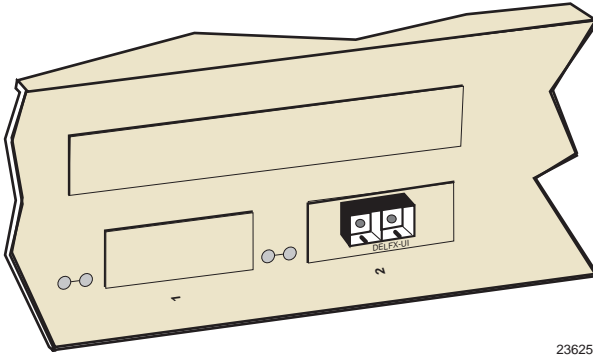
Figure B-2   DELFX-UI

Table B-1   Transmitter Power

Cable Type	Worst Case Budget	Typical Budget
50/125 µm fiber	6.0 dB	9.0 dB
62.5/125 µm fiber	9.0 dB	12.0 dB
100/140 µm fiber	15.0 dB	18.0 dB

The transmitter power levels and receive sensitivity levels listed are peak power levels after optical overshoot. A peak power meter must be used to correctly compare the values given above to those measured on any particular port. If power levels are being measured with an average power meter, add 3 dB to the measurement to compare the measured values to the values listed above.

B.3   DELF3-UI

The DELF3-UI shown in Figure B-3 uses an SC style connector that supports single mode fiber optic cabling. Specifications for the DELF3-UI are listed in Table B-2 below.
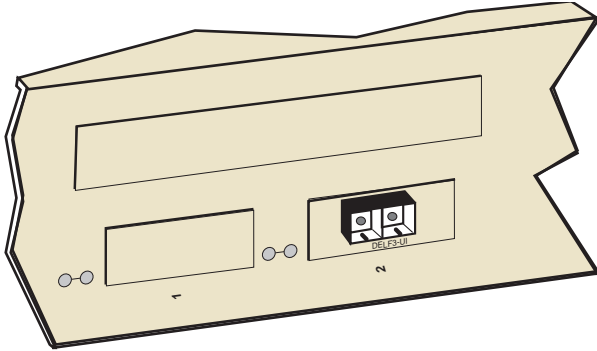
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Figure B-3   DELF3-UI

Table B-2   Transmitter Power

Cable Type	Worst Case Budget	Typical Budget
8/125 μm fiber	>10.0 dB	<10.0 dB
12/125 μm fiber	>10.0 dB	<10.0 dB

The transmitter power levels and receive sensitivity levels listed are peak power levels after optical overshoot. A peak power meter must be used to correctly compare the values given above to those measured on any particular port. If power levels are being measured with an average power meter, add 3 dB to the measurement to compare the measured values to the values listed above.

APPENDIX C

OPTIONAL INSTALLATIONS AND MODE SWITCH BANK SETTINGS

This appendix covers the following items:

• Required tools (Section C.1)

• Locations, functions, and settings for the mode switches (Section C.2)

• Installing Optional Fast Ethernet Interface Modules (Section C.3)

C.1 REQUIRED TOOLS

You need the following tools to perform the procedures provided in this appendix:

• Antistatic wrist strap (provided with DLM6C-AA chassis)

• Phillips screwdriver

C.2 SETTING THE MODE SWITCH

These switches are set at the factory and do not need to be changed unless you intend to perform the following:

• Force download a new image file from a BootP server.

• Clear NVRAM and restore all user-entered parameters such as the IP address and subnet mask to the DLEHF-MA "Default" configuration settings.

• Clear user-entered passwords stored in NVRAM and restore the default passwords.

Figure C-1 shows the location of the mode switches and the switch settings for normal operation.
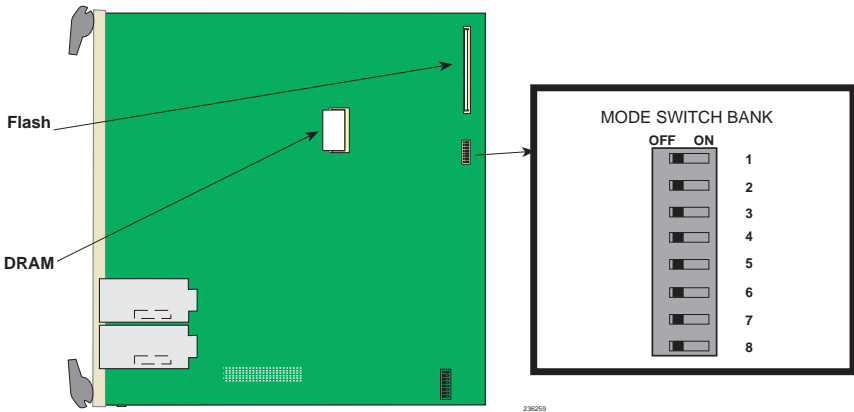
**Figure C-1   DLEHF-MA Mode Switch
Location/Component Layout**

Switch definitions and positions are as follows:

- Switches 1 through 4 – For DIGITAL use only.

- Switch 5 – COM Port Autobaud. The default (OFF) position enables Autobaud sensing on the COM port for Local Management sessions. Changing the switch to the ON position disables Autobaud sensing and sets the COM port to 9600 baud for Local Management sessions.

- Switch 6 – Forced BootP. Changing the position of this switch (i.e., moving the switch from one position to the other) clears download information from NVRAM and forces the DLEHF-MA to download a new image file from a BootP server after power to the chassis is restored, or the reset button is pressed.

After changing the position of switch 6, DO NOT reapply power to the chassis or reset the module until there is a station acting as a BootP server, which contains the image file.

• Switch 6 (continued)– After changing the position of switch 6 and restarting the module, the DLEHF-MA requests a new image download until it either receives a new image or the RESET button on the front panel is pressed. When the RESET button is pressed, the DLEHF-MA continues trying to contact a BootP server, but will time out in approximately one minute. If the module times out, the image is downloaded from its FLASH memory.

• Switch 7 – Clear NVRAM. Changing the position of this switch resets NVRAM on either the next power up or the next operation of the front panel RESET switch. ALL user entered parameters, such as IP addresses, subnet masks, SNMP traps, and bridging functions are restored to their factory default settings.

• Switch 8 – Reset Password/Community Strings. Changing the position of this switch clears only the user-entered passwords stored in NVRAM, and restores the default passwords. Once the DLEHF-MA is reset, the passwords can either be reentered or the default passwords (Public and ENTER) may be used.

> Do not change the position of switch 8 unless it is necessary to reset the module super-user configured passwords to their factory default settings.

C.3 INSTALLING OPTIONAL FAST ETHERNET INTERFACE MODULES

Figure C-2 shows the location of the Fast Ethernet Interface Module connectors on the DLEHF-MA board for port slots 1 and 2.

> For instructions on installing a High Speed Interface Module (HSIM) in the DLEHF-MA, refer to the applicable HSIM documentation.

Optional Fast Ethernet Interface Modules

Connectors

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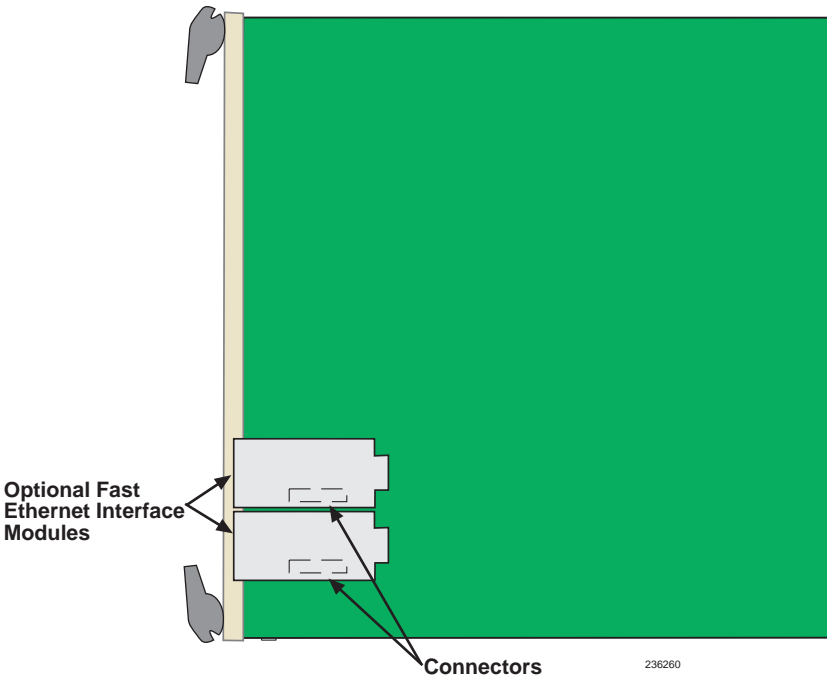
Figure C-2   Fast Ethernet Interface Module Connector Location

To install a Fast Ethernet Interface Module in port slot 1 or 2 of the DLEHF-MA, proceed as follows:

The DELHF-UA, FPIMS, and the host module are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could damage the Fast Ethernet Interface Module or the host module.

The DELF3-UI uses Class 1 lasers. 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.

1. Remove the coverplate from the port slot where the Fast Ethernet Interface Module will be installed.

When installing Fast Ethernet Interface Modules in both port slots 1 and 2, remove the coverplates from both slot openings. In the following instructions, the optional module is shown being installed in port slot 2.

To remove the coverplate, refer to Figure C-3 and proceed as follows:

a. Remove the two screws fastening the coverplate to the standoffs. Save the screws.

b. Lift and remove the coverplate from the top of the front standoffs.
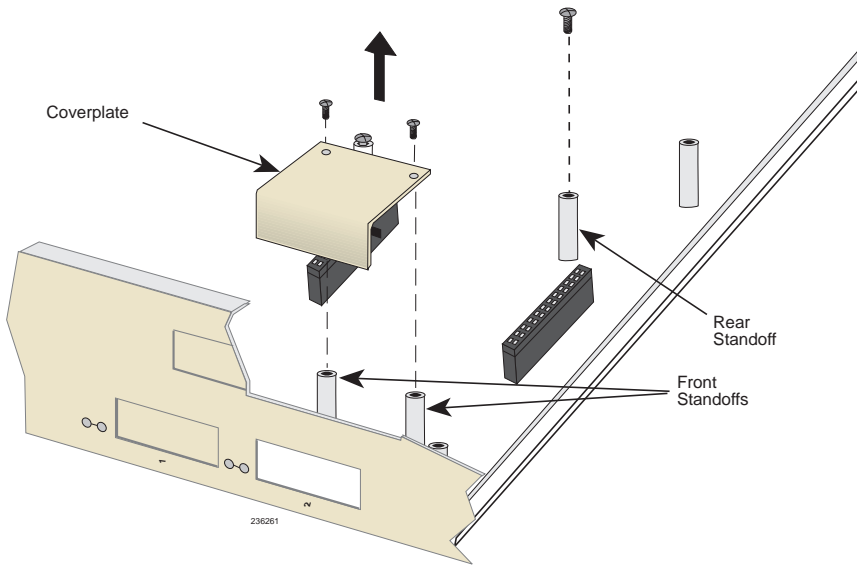
Figure C-3   Coverplate Removal

2. Remove the screw from the rear standoff. Save the screw.

> ⚠️ When installing a DELFX-UI or a DELF3-UI module into the host module, remove the rubber plug on the SC connector before proceeding. Be sure to replace the plug once the installation is complete to keep dust/dirt out of the fiber.

3. Refer to Figure C-4. Gently pull the faceplate of the host module forward to allow room for the Fast Ethernet Interface Modules to be aligned over the connector.

4. Carefully lower the Fast Ethernet Interface Module onto the standoffs while inserting the module connector into the associated motherboard connector.

> ⚠️ When inserting the Fast Ethernet Interface Module into the motherboard connector ensure that the pins do not bend, as this can damage both the Fast Ethernet Interface Module and the motherboard connector.
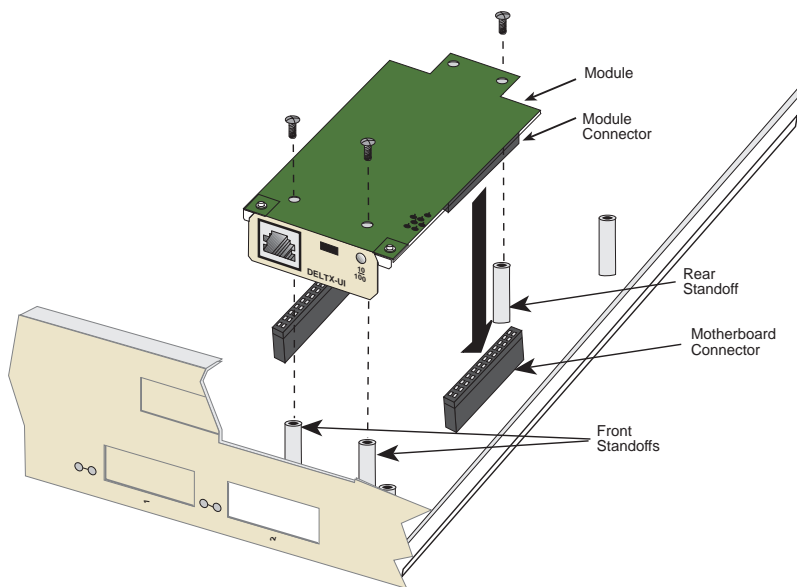
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Figure C-4   Installing the Fast Ethernet Interface Module

5. Press down firmly on the Fast Ethernet Interface Module until the pins slide all the way into the motherboard connector. Ensure that the Fast Ethernet Interface Module seats flush on the standoffs.

6. Secure the Fast Ethernet Interface Module with the screws saved in steps 1 and 2.

7. Installation is complete.

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