



DIGITAL
WAN Modular Interface FT1/T1

DELT1-UI
Local Management Guide

DIGITAL WAN Modular Interface FT1/T1

DELT1-UI Local Management Guide

Part Number: 9032621

September 1998

This manual describes how to use the DELT1-UI Modular Interface.

Revision/Update Information: This is a new document.

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

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

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

WARNING: THE DELT1-UI IS INTENDED TO BE INSTALLED IN CSA CERTIFIED/UL LISTED EQUIPMENT BY A QUALIFIED SERVICE PERSON. CHECK THE EQUIPMENT OPERATION/INSTALLATION INSTRUCTIONS AND/OR EQUIPMENT MANUFACTURER TO VERIFY/CONFIRM YOUR EQUIPMENT IS SUITABLE FOR INSTALLED APPLICATION CARDS.

WARNING: ALWAYS DISCONNECT T1 BOARD (THE ONE WITH THE TELEPHONE PLUG/JACK) FROM THE TELEPHONE SYSTEM WHEN INSTALLING OR WHEN THE COVERS ARE REMOVED FROM THE HOST PRODUCT.

CAUTION: APPLY THE ENCLOSED ADHESIVE WARNING LABEL TO THE OUTSIDE OR INSIDE OF THE EQUIPMENT ENCLOSURE ADJACENT TO THE T1 CARD.

© Copyright 1998 by Cabletron Systems, Inc., P.O. Box 5005, Rochester, NH 03866-5005
All Rights Reserved

Printed in the United States of America

Cabletron Systems is a registered trademark of Cabletron Systems, Inc.

DIGITAL and the DIGITAL logo are trademarks of Digital Equipment Corporation.

All other product names mentioned in this manual may be trademarks or registered trademarks of their respective companies.

UNITED STATES GOVERNMENT RESTRICTED RIGHTS

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

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

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.

IC Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power facility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

WARNING: USERS SHOULD NOT ATTEMPT TO MAKE SUCH CONNECTIONS THEMSELVES, BUT SHOULD CONTACT THE APPROPRIATE ELECTRIC INSPECTION AUTHORITY, OR ELECTRICIAN, AS APPROPRIATE.

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 Industry Canada.

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

VCCI Notice — Class A Computing Device:

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

Taiwanese Notice — Class A Computing Device:

警告使用者:

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

CE Notice — Class A Computing Device:

Warning!

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

Achtung!

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

Avertissement!

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

CABLETRON SYSTEMS, INC. PROGRAM LICENSE AGREEMENT

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

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

CABLETRON SOFTWARE PROGRAM LICENSE

1. **LICENSE.** You have the right to use only the one (1) copy of the Program provided in this package subject to the terms and conditions of this License Agreement. You may not copy, reproduce or transmit any part of the Program except as permitted by the Copyright Act of the United States or as authorized in writing by Cabletron.
2. **OTHER RESTRICTIONS.** You may not reverse engineer, decompile, or disassemble the Program.
3. **APPLICABLE LAW.** This License Agreement shall be interpreted and governed under the laws and in the state and federal courts of New Hampshire. You accept the personal jurisdiction and venue of the New Hampshire courts.

EXCLUSION OF WARRANTY AND DISCLAIMER OF LIABILITY

1. **EXCLUSION OF WARRANTY.** Except as may be specifically provided by Cabletron in writing, Cabletron makes no warranty, expressed or implied, concerning the Program (including its documentation and media).
CABLETRON DISCLAIMS ALL WARRANTIES, OTHER THAN THOSE SUPPLIED TO YOU BY CABLETRON IN WRITING, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PROGRAM, THE ACCOMPANYING WRITTEN MATERIALS, AND ANY ACCOMPANYING HARDWARE.
2. **NO LIABILITY FOR CONSEQUENTIAL DAMAGES.** IN NO EVENT SHALL CABLETRON OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS, PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR RELIANCE DAMAGES, OR OTHER LOSS) ARISING OUT OF THE USE OR INABILITY TO USE THIS CABLETRON PRODUCT, EVEN IF CABLETRON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. BECAUSE SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, OR ON THE DURATION OR LIMITATION OF IMPLIED WARRANTIES IN SOME INSTANCES THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU.

SAFETY INFORMATION

CLASS 1 LASER TRANSCEIVERS

THE DELF3-UI FAST ETHERNET INTERFACE MODULE, DEL05-UI FDDI PORT INTERFACE MODULE, AND DEL29-UI ATM 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 $8 \times 10^3 \text{ W m}^{-2} \text{ sr}^{-1}$.

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.

CONTENTS

PREFACE

Using This Guide	xi
Intended Audience.....	xi
Structure of This Guide.....	xi
Document Conventions	xii
Related Documentation	xii
Correspondence	xiii
Documentation Comments.....	xiii
World Wide Web	xiii
Getting Help.....	xiv

SAFETY

Overview.....	xv
Safety Requirements	xvi

CHAPTER 1 INTRODUCTION

1.1 DELT1-UI Features	1-1
1.1.1 WAN Protocols.....	1-1
1.1.2 MIB Support.....	1-1
1.2 DELT1-UI Specifications	1-2

CHAPTER 2 LOCAL MANAGEMENT

2.1 The WAN Physical Configuration Screen	2-2
2.1.1 WAN Physical Configuration Screen Fields.....	2-2
2.1.2 DELT1-UI Configuration Fields.....	2-3
2.1.3 The WPIM Timeslot Configuration Table.....	2-5
2.2 The WAN Interface Configuration Screen	2-7
2.2.1 WAN Interface Configuration Screen Fields	2-8
2.3 Full T-1 Configuration Using PPP.....	2-10
2.4 Fractional T-1 Configuration Using PPP.....	2-14
2.5 Frame Relay Configuration.....	2-18
2.6 LEX Configuration	2-22

APPENDIX A WAN INTERFACE CABLE SPECIFICATIONS

APPENDIX B FCC PART 68 - USER'S INFORMATION

APPENDIX C WAN TERMS AND ACRONYMS

PREFACE

Welcome to the *DIGITAL WAN Modular Interface FT1/T1 DELT1-UI Local Management Guide*. This manual explains how to use Local Management to control and manage the DIGITAL DELT1-UI. Appendix A of this guide provides connector and pinout information for the DELT1-UI.

USING THIS GUIDE

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



Unless noted differently, the information in this guide applies to the DIGITAL WAN Modular Interface FT1/T1 module, which is referred to as the DELT1-UI or WPIM (WAN Physical Interface Module).

INTENDED AUDIENCE

This guide is intended for use by personnel who will manage the DIGITAL WAN Modular Interface FT1/T1 (DELT1-UI).

STRUCTURE OF THIS GUIDE

Chapter 1, Introduction, describes DELT1-UI features and lists specifications.

Chapter 2, Local Management, describes how to use Local Management to set up the DELT1-UI.

Appendix A, WAN Interface Cable Specifications, provides Cabletron part numbers and connector information for DELT1-UI interface cables.

Appendix B, FCC Part 68 - User's Information, explains the FCC rules for the DELT1-UI.

Appendix C, WAN Terms and Acronyms, is a brief glossary of the terms used in this book.

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.

RELATED DOCUMENTATION

The following manuals may help the user to set up and manage the DELT1-UI. These manuals can be obtained on the World Wide Web at <http://www.digital.com/> in Adobe Acrobat Portable Document Format (PDF):

- *Cabletron Cabling Guide*
- *DIGITAL OPEN DECconnect Structured Wiring System Application 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	Enthält Informationen, die beachtet werden müssen um den Benutzer vor Schaden zu bewahren.
	DANGER	Signale les informations destinées à prévenir les accidents corporels.
	AVISO	Contiene información para evitar daños personales.
	CAUTION	Contains information essential to avoid damage to the equipment.
	ACHTUNG	Enthält Informationen, die beachtet werden müssen um die Geräte vor Schaden zu bewahren.
	ATTENTION	Signale les informations destinées à prévenir la détérioration du matériel.
	PRECAUCIÓN	Contiene información 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.

	<p>WARNING</p>	<p>THE DELT1-UI IS INTENDED TO BE INSTALLED IN CSA CERTIFIED/UL LISTED EQUIPMENT BY A QUALIFIED SERVICE PERSON. CHECK THE EQUIPMENT OPERATION/INSTALLATION INSTRUCTIONS AND/OR EQUIPMENT MANUFACTURER TO VERIFY/CONFIRM YOUR EQUIPMENT IS SUITABLE FOR INSTALLED APPLICATION CARDS.</p>
	<p>VORSICHT</p>	<p>DER DELT1-UI IST FÜR DEN EINBAU IN CSA-GENEHMIGTEN/UL-GELISTETEN GERÄTEN KONZIPIERT WORDEN. DER EINBAU DARF NUR VON ENTSPRECHEND QUALIFIZIERTEN FACHLEUTEN DURCHGEFÜHRT WERDEN. ÜBERPRÜFEN SIE DIE BETRIEBS- /INSTALLATIONSANLEITUNG UND/ODER DEN GERÄTEHERSTELLER, UM SICHERZUSTELLEN ODER ZU BESTÄTIGEN, DAß IHR GERÄT FÜR DIE INSTALLIERTEN ANWENDUNGSKARTEN GEEIGNET IST.</p>
	<p>DANGER</p>	<p>DANGER :L'APPAREIL DELT1-UI DOIT ETRE INSTALLE SUR DES EQUIPEMENTS CERTIFIES PAR LE CSA ET REPERTORIES PAR L'UL, UNIQUEMENT PAR DU PERSONNEL DE SERVICE QUALIFIE. LISEZ LES INSTRUCTIONS D'INSTALLATION ET DE FONCTIONNEMENT OU ADRESSEZ-VOUS AU CONSTRUCTEUR POUR VERIFIER/CONFIRMER QUE VOTRE EQUIPEMENT CONVIENT AUX CARTES D'APPLICATIONS INSTALLEES.</p>

<p>AVISO</p>	<p>AVISO:EL DELT1-UI HA SIDO DISEÑADO PARA SU INSTALACIÓN EN UN EQUIPO CERTIFICADO POR CSA O LISTADO POR UL POR UN REPRESENTANTE CUALIFICADO DEL SERVICIO TÉCNICO. COMPRUEBE LAS INSTRUCCIONES DE FUNCIONAMIENTO Y/O INSTALACIÓN DEL EQUIPO Y/O CONSULTE AL FABRICANTE DEL MISMO PARA VERIFICAR Y/O CONFIRMAR QUE ADMITE TARJETAS DE APLICACIONES INSTALADAS.</p>
<p>WARNING</p>	<p>ALWAYS DISCONNECT T1 BOARD (THE ONE WITH THE TELEPHONE PLUG/JACK) FROM THE TELEPHONE SYSTEM WHEN INSTALLING OR WHEN THE COVERS ARE REMOVED FROM THE HOST PRODUCT.</p>
<p>VORSICHT</p>	<p>TRENNEN SIE VOR DER INSTALLATION ODER BEIM ENTFERNEN DER ABDECKUNGEN VOM HOSTPRODUKT GRUNDSÄTZLICH IMMER DIE T1-KARTE (DIE KARTE MIT DEM TELEFONANSCHLUß) VOM TELEFONSYSTEM.</p>
<p>DANGER</p>	<p>NE BRANCHEZ PAS LA CARTE T1 (CELLE EQUIPEE DE LA PRISE TELEPHONE) AU SYSTEME DE TELEPHONE LORS DE L'INSTALLATION OU LORSQUE LES CAPOTS DE L'EQUIPEMENT SONT DEPOSES.</p>
<p>AVISO</p>	<p>SIEMPRE DESCONECTE DEL SISTEMA TELEFÓNICO LA PLACA T1 (LA QUE TIENE LA CLAVIJA TELEFÓNICA) DURANTE LA INSTALACIÓN Y CUANDO VAYA A ABRIR Y/O RETIRAR LAS CUBIERTAS DEL PRODUCTO HOST.</p>
<p>WARNING</p>	<p>USERS SHOULD NOT ATTEMPT TO MAKE SUCH CONNECTIONS THEMSELVES, BUT SHOULD CONTACT THE APPROPRIATE ELECTRIC INSPECTION AUTHORITY, OR ELECTRICIAN, AS APPROPRIATE.</p>

VORSICHT	BENUTZER SOLLTEN NICHT VERSUCHEN, SOLCHE VERBINDUNGEN SELBST HERZUSTELLEN, SONDERN SICH IMMER AN DAS ZUSTÄNDIGE ELEKTROVERSORGUNGSUNTERNEHMEN ODER AN EINEN ELEKTRIKER WENDEN.
DANGER	LES UTILISATEURS NE DOIVENT PAS EFFECTUER LES CONNEXIONS EUX-MEMES, MAIS DOIVENT CONTACTER L'ORGANISME D'INSPECTION CONCERNE OU UN ELECTRICIEN, SELON LE CAS.
AVISO	LOS USUARIOS NO DEBEN INTENTAR REALIZAR ESTA CONEXIÓN POR SÍ MISMOS, SINO QUE DEBEN PONERSE EN CONTACTO CON LAS AUTORIDADES DE INSPECCIÓN ELÉCTRICA COMPETENTES, O CON UN ELECTRICISTA, SEGÚN PROCEDA.



CAUTION	If you are using a Local clock source, set only one end of the circuit for Local, the other end must be set for Loop.
ACHTUNG	Wenn Sie einen lokalen Takteingang verwenden, stellen Sie nur ein Ende des Schaltkreises auf Lokal; daß andere muß auf Loop gesetzt werden.
ATTENTION	Si vous utilisez une source d'horloge locale, ne réglez qu'une borne du circuit sur Local, l'autre devant être réglée sur Boucle (Loop).
PRECAUCIÓN	Si está usando una fuente de reloj local, defina únicamente uno de los extremos como Local; el otro extremo deberá estar definido como Loop.
CAUTION	APPLY THE ENCLOSED ADHESIVE WARNING LABEL TO THE OUTSIDE OR INSIDE OF THE EQUIPMENT ENCLOSURE ADJACENT TO THE T1 CARD.
ACHTUNG	KLEBEN SIE DAS BEIGEFÜGTE ETIKETT MIT DEM VORSICHTSHINWEIS AUF DIE INNEN- ODER AUßENSEITE DES GERÄTEGEHÄUSES NEBEN DER T1-KARTE.
ATTENTION	COLLEZ L'ETIQUETTE ADHESIVE A L'EXTERIEUR OU A L'INTERIEUR DE L'ENCEINTE DE L'EQUIPEMENT ADJACENTE A LA CARTE T1.
PRECAUCIÓN	COLOQUE LA ETIQUETA AUTOADHESIVA DE AVISO EN LA PARTE EXTERIOR O INTERIOR DE LA CARCASA DEL EQUIPO JUNTO A LA TARJETA T1.

CHAPTER 1

INTRODUCTION

1.1 DELT1-UI FEATURES

The DELT1-UI resides in and provides connectivity/functionality to DIGITAL Wide Area Network (WAN) modules.

Before using this manual you must:

- Install the DELT1-UI in a Wide Area Network module. Refer to the appropriate manual for installation and troubleshooting procedures.
- Set up and access Local Management. Refer to the appropriate host module, standalone hub, or module User's Guide for instructions on setting up and accessing Local Management.

1.1.1 WAN Protocols

As of this printing, the module in which the DELT1-UI is installed supports the following WAN protocols (refer to the Release Notes included with the host module for a list of current protocols):

- Point to Point Protocol (LCP) and as defined by RFC 1661
- Point to Point Protocol (BNCP) and as defined by RFC 1638
- Point to Point Protocol LAN Extender (PPP/LEX)
- Frame Relay as defined by RFC 1490

1.1.2 MIB Support

Refer to the Release Notes included with the host module or standalone hub for a list of all MIBs supported by the DELT1-UI. For information about how to extract and compile individual MIBs, contact your DIGITAL representative.

1.2 DELT1-UI SPECIFICATIONS

This section describes the environmental specifications, safety and approval requirements for the DELT1-UI. Cabletron Systems reserves the right to change these specifications without notice.

Environmental Requirements

Operating Temperature: +5° to +40°C (41° to 104°F)

Non-operating Temperature: -30° to +90°C (-22° to 194°F)

Operating Humidity: 5% to 95% (non-condensing)

Safety

This unit meets the safety requirements of UL1950 (without D3 deviations), CSA C22.2 No. 950, and EN60950.

EMI

This unit meets the EMI requirements of FCC Part 15 Class A.

EMC

This unit meets the EMC requirements of EN50082-1 including: IEC 801-2 (ESD), IEC 801-3 (Radiated Susceptibility), and IEC 801-4 (EFT/B).

NEBS

This unit has been tested by Bellcore and found to comply with the following Bellcore standards:

TR-NWT-000063 Network Equipment Building System (NEBS)
Generic Equipment Requirements.

GR-1089-CORE EMC and Electrical Safety Generic Criteria for
Network Telecommunications Equipment.

TELECOM

The DELT1-UI meets FCC Part 68 (see Appendix B).

REGULATORY COMPLIANCE

Certification: CE, CSA, C-TICK, FCC, TUV, UL, VCCI

CHAPTER 2

LOCAL MANAGEMENT

This chapter explains how to configure the DELT1-UI through Local Management. The **WAN Physical Configuration screen** and the **WAN Interface Configuration screen** appear as Local Management menu selections after you install the DELT1-UI into a WAN module and then install the module into a host module or standalone hub. Refer to the host or standalone hub technical documentation for instructions about how to set up and access Local Management.

This chapter contains the following sections.

The WAN Physical Configuration screen	Section 2.1
The WAN Interface Configuration screen	Section 2.2
Full T-1 Configuration Using PPP	Section 2.3
Fractional T-1 Configuration Using PPP	Section 2.4
Frame Relay Configuration	Section 2.5
LEX Configuration	Section 2.6

Read [Section 2.1](#) and [Section 2.2](#) to gain an understanding of the DELT1-UI Local Management screens. [Section 2.3](#) through [Section 2.6](#) provide examples for setting up the DELT1-UI for full or fractional T-1 in a PPP (LEX or BNCP) environment, or for configuring the DELT1-UI for Frame Relay.



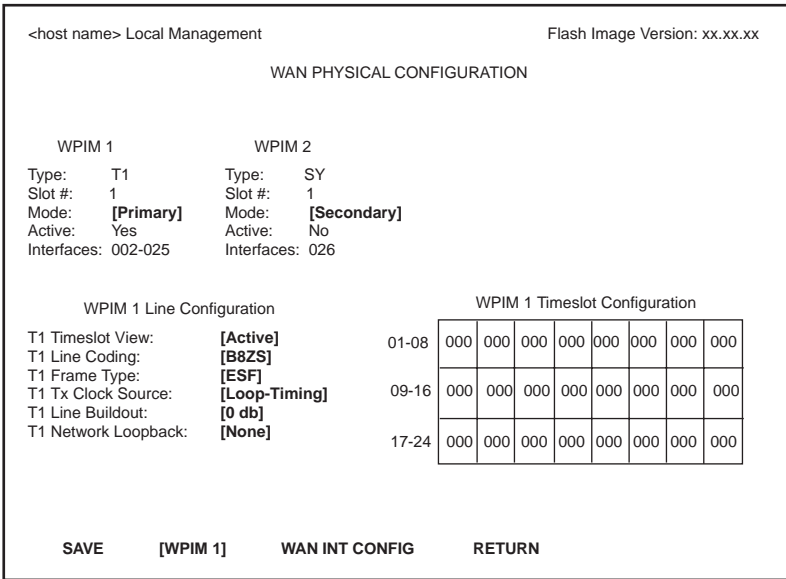
Navigate through the WPIM Local Management Screens by using the following keyboard commands: SPACEBAR to toggle between selections in a field.

ENTER (RETURN) to implement a selection.

Arrow keys to move up, down or sideways within the screen.

2.1 THE WAN PHYSICAL CONFIGURATION SCREEN

To access the WAN Physical Configuration screen from the Feature Selection screen, use the arrow keys to highlight the WAN Configuration option, then press ENTER. The screen shown in Figure 2-1 appears.



148201

Figure 2-1 WAN Physical Configuration Screen

2.1.1 WAN Physical Configuration Screen Fields

The following sections describe WAN Physical Configuration screen fields and instructions for setting them. The WAN Physical Configuration screen lets you configure the WPIM or “Physical Interface.”

DIGITAL offers a variety of WPIMs. The following Physical Configuration screen examples show the DELT1-UI and the DELSY-UI. Select the WPIM you wish to configure by using the arrow keys to highlight the WPIM command field at the bottom of the screen. Use the SPACEBAR to select the appropriate WPIM, then press ENTER. The WAN Configuration screen automatically displays unique configuration fields for each WPIM as shown in Figure 2-1.

The WAN Physical Configuration screen displays the following information for each WPIM:

WPIM 1-4

Displays configuration information for as many as four WPIMs.

Type

Displays the WPIM type.

SLOT #

Displays the slot in which the WPIM resides.

Mode

Displays the WPIM mode. Toggles between Primary and Secondary. In a device where two WPIMs are utilized but only one can be active at a given time, the second WPIM installed or recognized defaults to Secondary.

Active

Displays the status of the WPIM, Yes or No.

Interfaces

Displays the interfaces available to each WPIM.

2.1.2 DELT1-UI Configuration Fields

The configuration fields displayed on the Physical Configuration screen shown in [Figure 2-1](#) vary depending on the type of WPIM. The examples in this Local Management Guide cover the DELT1-UI. Each DIGITAL WPIM has a Local Management Guide that provides specific configuration guidelines and examples.



The service provider (i.e., AT&T, Sprint, MCI, NYNEX, etc.) determines the settings for the following fields. Consult the service provider for the correct settings.

T1 Timeslot View

Displays the status of the Timeslot Configuration Table. The selections for this field toggle between Active and New. The Active setting displays current Timeslot Configuration table settings. The default setting is **Active**. The New setting allows you to change Timeslot Configuration table settings. The default setting for the Timeslot Configuration table is all Timeslots not assigned (**000**).

T1 Line Coding

Displays the line coding for the physical T-1 line. The selections toggle between B8ZS and AMI. The default setting for this field is **B8ZS**.

T1 Frame Type

Displays the T-1 Frame type. The selections toggle between ESF and D4. The default setting for this field is **ESF**.

T1 Tx Clock Source

Displays the T-1 Transmit Clock Source. The selections for this field toggle between Loop-Timing (Extracted Line Data) and Local-Timing (Internal Clock). The default setting for this field is **Loop-Timing**.

T1 Line Buildout

Displays the line coding for the physical T-1 line. Set this to 0 dB unless the service provider recommends another setting. The default setting for this field is **0 dB**. The selections for this setting toggle between the following levels.

- 0 dB
- -7.5 dB
- -15 dB
- 133-266 Ft
- 267-399 Ft
- 400-533 Ft
- 534-655 Ft

T1 Network Loopback

Network Loopback is a testing procedure that segments the line and allows the user to isolate faults. The selections for this field toggle between None and Line-Loop. In Line-Loop all 24 channels are looped back to the T-1 line. The DELT1-UI must be in Loop-Timing mode to use this option. The default setting is **None**.

2.1.3 The WPIM Timeslot Configuration Table

The WPIM Timeslot Configuration table allows you to configure the way in which the WAN module uses the T-1 line. The configuration table consists of 24 Timeslots. You must assign each Timeslot an **Interface** number (for example, 002 for an active Interface number or 000 if the Timeslot is not used). When you lease an entire T-1 line, you can use all 24 Timeslots (the full T-1 bandwidth). If you lease only a fraction of the T-1, the service provider tells you which Timeslots to use.

You can utilize Timeslots any way you choose. The DELT1-UI supports Time Division Multiplexing (TDM) allowing channelization of circuits (Timeslots) within the public network. For example, if you have access to a full T-1 (24 Timeslots), and you want to communicate with two other sites, your configuration might look like [Figure 2-2](#).

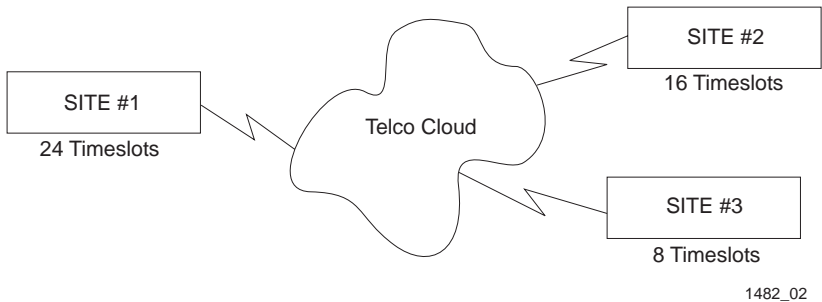


Figure 2-2 Sample Timeslot Configuration

Figure 2-3 shows a sample configuration for three sites. Of the 24 Timeslots, Site #1 uses 16 to communicate with Site #2 and the remaining 8 to communicate with Site #3. This configuration varies tremendously depending on how the service provider maps out the T-1 Timeslots. Your service provider will tell you which Timeslots are active.

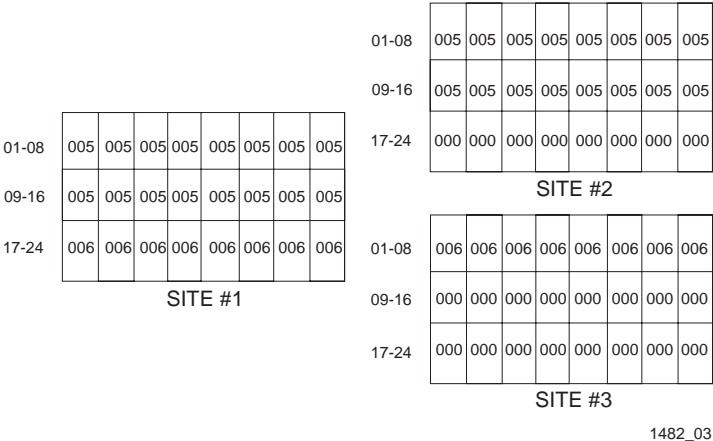


Figure 2-3 Sample Configuration

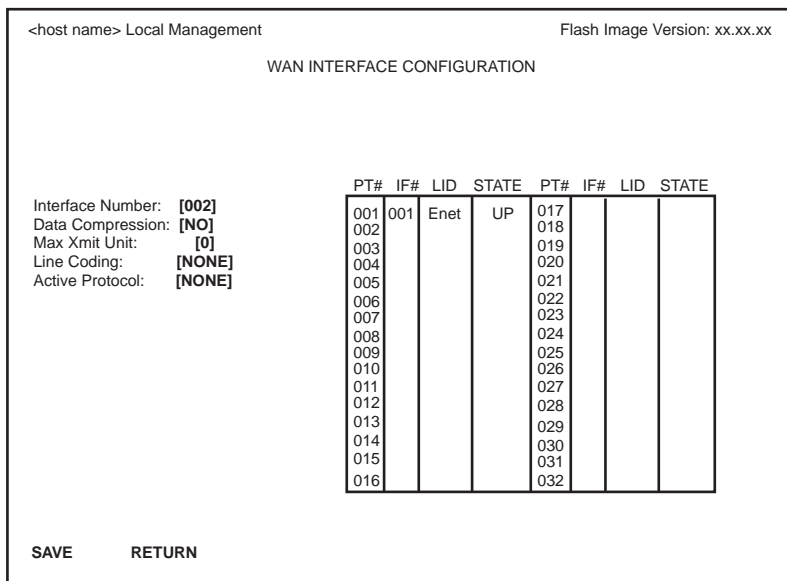
Site #1 is using the full T-1, so all the Timeslots must have an Interface assignment. Site #2 and Site #3 only use a fraction of the T-1, but the total quantity of Timeslots must match those of Site #1. Unused Timeslots receive an Interface number of 000.



The Interface numbers of Site #1, Site #2 and Site #3 do not have to match. Only the **quantity** of Timeslots must match (the service provider assigns the Timeslots).

2.2 THE WAN INTERFACE CONFIGURATION SCREEN

This section describes the features of the WAN Interface Configuration screen. Access the screen by using the arrow keys to highlight the **WAN Int Config** option at the bottom of the Physical Configuration screen, then press ENTER. The WAN Interface Configuration screen shown in Figure 2-4 appears.



148204

Figure 2-4 WAN Interface Configuration Screen

2.2.1 WAN Interface Configuration Screen Fields

This section describes the WAN Interface Configuration screen fields.

Interface Number

Displays the active Interface Numbers. Use this field to configure the Interface Numbers you assigned to the Timeslots on the WAN Physical Configuration screen.

Data Compression

Displays the status of Data Compression. This field displays YES or NO. The default setting is **NO**.

Max Xmit Unit

User-configured field that displays the maximum packet size that can be transmitted on the selected interface. The default settings for this field are **8191** for PPP and **4095** for Frame Relay.

Line Coding

Displays the Line Coding for timeslots associated with this interface. This field displays JBZS, INV-HDLC, or None. The default setting for this field is **None**.

Active Protocol

Displays the active OSI Layer protocol. This field toggles between None, FR (Frame Relay), or PPP (Point-to-Point). The default setting is **None**.

If you select **PPP**, the following field appears:

PPP Type: This field toggles between BNCP or LEX.

If you select **FR**, the following field appears:

FR LMP: This field displays NO LMI, Q.933-A or T1.617-D. Set this field to **T1.617-D**. The NO LMI setting is for specialized applications in which no Frame Relay Link Management is available or required.

If **NO LMI** is selected, the following fields are displayed:

DLCI Address: This field can be set to values from 0-1023. The values 0-15 and 1008-1022 are reserved DLCI addresses.

Circuit State: Toggles between Active, Inactive and Invalid.

PT#

Displays the application ports (bridge ports) available from the host platform to the WAN. If the active protocol is PPP, Local Management assigns only one application port per interface number (IF#). If the active protocol is Frame Relay, Local Management assigns the available WAN bridge ports from the host platform, one per DLCI.

You can assign WAN application ports to the 24 interfaces for the PPP configuration that suits your needs. In a Frame Relay configuration, you can assign all WAN application ports to one interface. In this example, the remaining 23 interfaces would not have WAN application ports available.

The quantity of application ports for a Frame Relay network is determined by the quantity of DLCIs (Data Link Connection Identifiers) assigned to that Interface. This is determined either manually or by the LMP (Link Management Protocol).

IF#

Displays the Interface that is associated with the application port.

LID

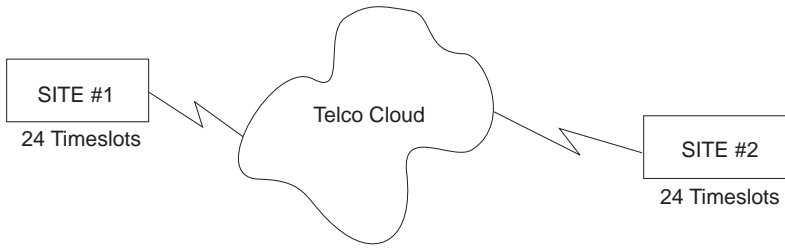
Displays the Link Identifier. If the active protocol is Frame Relay, the Data Link Connection Identifier is displayed. If the active protocol for this interface is PPP, then PPP appears in this field.

STATE

Displays the status of the application port. If the active protocol is Frame Relay, this field displays the status as Active, Inactive, or Disabled (for no LMI). If the active protocol is PPP, this field displays UP (for active) or DOWN (for inactive).

2.3 FULL T-1 CONFIGURATION USING PPP

This section provides step-by-step instructions for configuring the DELT1-UI to use a full T-1 circuit in a PPP environment. This simplified example assumes the setup shown in Figure 2-5 using a hub with a WPIM containing a DELT1-UI at Site #1. Configurations may vary depending on the hub.



1482_05

Figure 2-5 Full T-1 Configuration

The line configuration information shown in Table 2-1 must be supplied by the service provider.

Table 2-1 Telco Configuration Information

Configuration Information Required by User	Configuration Information Supplied by Service Provider
Line Coding	B8ZS or AMI
Frame Type	ESF or D4
Clock Source	Loop Timing or Local Timing

2.3.1 DELT1-UI Physical Configuration

Begin the DELT1-UI configuration by accessing the WAN Physical Configuration screen through Local Management (Figure 2-1). Access the WAN Physical Configuration screen from the Feature Selection screen that first appears when you enter Local Management. Use the arrow keys to highlight the **WAN Configuration** option, then press ENTER. The screen shown in Figure 2-1 appears. Proceed with the following steps:

1. Use the arrow keys to highlight the [WPIM] field at the bottom of the screen. Press the SPACEBAR to select the WPIM being configured, then press ENTER.
2. Use the arrow keys to highlight **Timeslot View**. Press the SPACEBAR to select **New**, then press ENTER. The cursor moves to Timeslot #1 of the Timeslot Configuration Table.
3. Insert an interface number (see the Note below) into every Timeslot. Type the number, press ENTER, then use the arrow keys to highlight the next Timeslot field. Exit this field by using the arrow keys. The cursor automatically moves to the **T1 Line Coding** field.



The value assigned to the Timeslots is the interface being used for WAN communication. The available interface range is displayed on the WAN Physical Configuration screen (see Figure 2-1). You may insert any of the available interface numbers into the Timeslots.

In the example shown in Figure 2-1, the interface range for the WPIM with a DELT1-UI in slot one of the WPIM is 2-25. Although any of these values may be used, DIGITAL recommends using the first available interface number (in this example interface #2).

The following four steps are based on information supplied by the service provider. Consult the service provider for the correct settings.

4. Use the arrow keys to highlight **T1 Line Coding**. Press the SPACEBAR to select **B8ZS** or **AMI**, then press ENTER.

5. Use the arrow keys to highlight **T1 Frame Type**. Press the SPACEBAR to select **ESF** or **D4**, then press ENTER.
6. Use the arrow keys to highlight **T1 TX Clock Source**. Press the SPACEBAR to select **Local** (no clock source provided by telephone company) or **Loop** (clock source provided by telephone company), then press ENTER.



If you are using a Local clock source, set only one end of the circuit for Local, the other end must be set for Loop.

7. Use the arrow keys to highlight **T1 Line Buildout (LBO)**. Press the SPACEBAR to select **0 dB** unless the service provider recommends another setting, then press ENTER.
8. Use the arrow keys to highlight **T1 Network Loopback**. Press the SPACEBAR to select **None**, then press ENTER.
9. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The message “Save Done!” appears and Local Management saves the changes to memory.
10. Access the WAN Interface Configuration screen by using the arrow keys to highlight the **WAN Int Config** option, then press ENTER.

2.3.2 DELT1-UI Interface Configuration

This screen is accessed through the WAN Physical Configuration screen. Refer to [Figure 2-4](#) and proceed with the following steps to configure the WAN Interface through Local Management.

1. Set the WAN connection Interface Number by typing the same number into the **Interface Number** field that was input into the Timeslots in the WAN Physical Configuration screen, then press ENTER (see the Note in Section 2.3.1).

2. Unless the user sets the Max Xmit Unit, the DELT1-UI automatically sets the **Max Xmit Unit** to **8191** (default) after the active protocol (PPP) is selected.
3. If the T1 Line Coding is **B8ZS** on the previous screen:
 - a. Use the arrow keys to highlight **Line Coding**. Press the SPACEBAR to select **None**, then press ENTER.
 - b. Use the arrow keys to highlight **Active Protocol**. Press the SPACEBAR to select **PPP**, then press ENTER.
 - c. Use the arrow keys to highlight **PPP Type**. Press the SPACEBAR to select **BNCP**, then press ENTER.
4. If the T1 Line Coding is **AMI** on the previous screen:
 - a. Use the arrow keys to highlight **Line Coding**. Press the SPACEBAR to select **INV-HDLC**, then press ENTER.
 - b. Use the arrow keys to highlight **Active Protocol**. Press the SPACEBAR to select **PPP**, then press ENTER.
 - c. Use the arrow keys to highlight **PPP Type**. Press the SPACEBAR to select **BNCP**, then press ENTER.
5. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The message “Save Done!” appears and Local Management saves the changes to memory.



Upon saving this screen, the interface just configured is assigned to an application port (PT#) in the table on the right hand side of the screen.

The WAN configuration is complete. It takes up to 60 seconds for the WAN Interface to come out of standby and for communications to begin.

2.4 FRACTIONAL T-1 CONFIGURATION USING PPP

This section provides step-by-step instructions for configuring the DELT1-UI to use a fractional T-1 circuit in a PPP environment. This example assumes the setup shown in [Figure 2-6](#) using two hubs each with a WPIM containing a DELT1-UI. Configurations may vary depending on the hub. In a fractional T-1 setup, only a portion of the 24 Timeslots or DS-0s are used.



The terms DS-0 (Digital Signal, level 0) and Timeslot are used synonymously in this guide to represent a standard 64,000 bit/second channel.

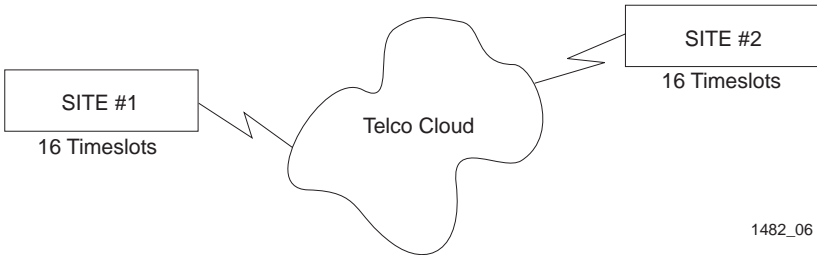


Figure 2-6 Fractional T-1 Configuration

The line configuration information shown in [Table 2-2](#) must be supplied by the service provider.

Table 2-2 Telco Configuration Information

Configuration Information Required by User	Information Supplied by Service Provider
Line Coding	B8ZS or AMI
Frame Type	ESF or D4
Clock Source	Loop Timing or Local Timing
DS-0's (Timeslots)	Timeslots being used for each end of the circuit

2.4.1 DELT1-UI Physical Configuration

Begin the DELT1-UI physical configuration by accessing the **WAN Physical Configuration** screen through Local Management (Figure 2-1). Proceed with the following steps:

1. Use the arrow keys to highlight the **[WPIM]** field at the bottom of the screen. Press the SPACEBAR to select the WPIM being configured, then press ENTER.
2. Use the arrow keys to highlight **Timeslot View**. Press the SPACEBAR until **NEW** appears, then press ENTER. The cursor moves to Timeslot #1 of the Timeslot Configuration Table.
3. Insert an interface number (see the Note below) into every Timeslot being used (in the example shown in Figure 2-6, 16 Timeslots are being used, the rest have zeros in them). Type the number, press ENTER, then use the arrow keys to highlight the next Timeslot field. Exit this field by using the arrow keys. The cursor automatically moves to the **T1 Line Coding** field.



The value assigned to the Timeslots is the interface being used for WAN communication. The available interface range is displayed on the WAN Physical Configuration screen (see Figure 2-1). You may insert any of the available interface numbers into the Timeslots.

In the example shown in Figure 2-1, the interface range for the WPIM with a DELT1-UI in slot one of the WPIM is 2-25. Although any of these values may be used, Digital Equipment Corporation recommends using the first available interface number (in this example interface #2).

The following four steps are based on information supplied by the service provider. Consult the service provider for the correct settings.

4. Use the arrow keys to highlight **T1 Line Coding**. Use the SPACEBAR to select **B8ZS** or **AMI**, then press ENTER.

5. Use the arrow keys to highlight **T1 Frame Type**. Use the SPACEBAR to select **ESF** or **D4**, then press ENTER.
6. Use the arrow keys to highlight **T1 Tx Clock Source**. Use the SPACEBAR to select **Local** (no clock source provided by telephone company) or **Loop** (clock source provided by telephone company), then press ENTER.



If you are using a Local clock source, set only one end of the circuit for Local, the other end must be set for Loop.

7. Use the arrow keys to highlight **T1 Line Buildout (LBO)**. Press the SPACEBAR to select **0 dB** unless the service provider recommends another setting, then press ENTER.
8. Use the arrow keys to highlight **T1 Network Loopback**. Press the SPACEBAR to select **None**, then press ENTER.
9. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The message “Save Done!” appears and Local Management saves the changes to memory.
10. Access the WAN Interface Configuration screen by using the arrow keys to highlight the **WAN Int Config** option, then press ENTER.

2.4.2 DELT1-UI Interface Configuration

This screen is accessed through the WAN Physical Configuration screen. Proceed with the following steps to configure the WAN Interface through Local Management.

1. Set the WAN connection Interface Number by typing the same number into the **Interface Number** field that was input into the Timeslots in the WAN Physical Configuration screen, then press ENTER (see the Note in Section 2.4.1 on page 15).
2. Unless the user sets the Max Xmit Unit, the DELT1-UI automatically sets the **Max Xmit Unit** to **8191** (default) after the active protocol (PPP) is selected.
3. If the T1 Line Coding is **B8ZS** on the previous screen:
 - a. Use the arrow keys to highlight **Line Coding**. Press the SPACEBAR to select **NONE**, then press ENTER.
 - b. Use the arrow keys to highlight **Active Protocol**. Press the SPACEBAR to select **PPP**, then press ENTER.
 - c. Use the arrow keys to highlight **PPP Type**. Press the SPACEBAR to select **BNCP**, then press ENTER.
4. If the T1 Line Coding is **AMI** on the previous screen:
 - a. Use the arrow keys to highlight **Line Coding**. Press the SPACEBAR to select **INV-HDLC**, then press ENTER.
 - b. Use the arrow keys to highlight **Active Protocol**. Press the SPACEBAR to select **PPP**, then press ENTER.
 - c. Use the arrow keys to highlight **PPP Type**. Press the SPACEBAR to select **BNCP**, then press ENTER.
5. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The message “Save Done!” appears and Local Management saves the changes to memory.



Upon saving this screen, the interface just configured is assigned to an application port (PT#) in the table on the right hand side of the screen.

The WAN configuration is complete. It takes up to 60 seconds for the WAN Interface to come out of standby and for communications to begin.

2.5 FRAME RELAY CONFIGURATION

This section provides step-by-step instructions for configuring the DELT1-UI to use a T-1 circuit in a Frame Relay environment. This example assumes the setup shown in [Figure 2-7](#) using two hubs each with a WPIM containing a DELT1-UI. Configurations may vary depending on the hub.

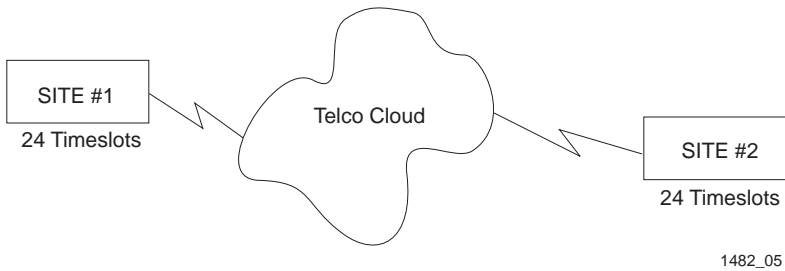


Figure 2-7 Frame Relay Configuration

The following information must be supplied to or by the service provider.

- LMP type: **ANSI T1.617 Annex D**

The line configuration information shown in [Table 2-3](#) must be supplied by the service provider.

Table 2-3 Telco Configuration Information

Configuration Information Required by Customer	Information Supplied by Service Provider
Line Coding	B8ZS or AMI
Frame Type	ESF or D4
Clock Source	Loop Timing or Local Timing
DS-0's (Timeslots)	Timeslots being used for each end of the circuit

2.5.1 DELT1-UI Physical Configuration

Begin the DELT1-UI physical configuration by accessing the **WAN Physical Configuration** screen through Local Management ([Figure 2-1](#)). Proceed with the following steps:

1. Use the arrow keys to highlight the **[WPIM]** field at the bottom of the screen. Press the SPACEBAR to select the WPIM being configured, then press ENTER.
2. Use the arrow keys to highlight **Timeslot View**. Press the SPACEBAR to select **New**, then press ENTER. The cursor moves to Timeslot #1 of the Timeslot Configuration Table.
3. Insert an interface number (see the Note below) into every Timeslot being used. Type the number, press ENTER, then use the arrow keys to highlight the next Timeslot field. Exit this field by using the arrow keys. The cursor automatically moves to the **T1 Line Coding** field.



The value assigned to the Timeslots is the interface being used for WAN communication. The available interface range is displayed on the WAN Physical Configuration screen (see [Figure 2-1](#)). You may insert any of the available interface numbers into the Timeslots.

In the example shown in [Figure 2-1](#), the interface range for the WPIM with a DELT1-UI in slot one of the WPIM is 2-25. Although any of these values may be used, Digital Equipment Corporation recommends using the first available interface number (in this example interface #2).

The following four steps are based on information supplied by the service provider. Consult the service provider for the correct settings.

4. Use the arrow keys to highlight **T1 Line Coding**. Press the SPACEBAR to select **B8ZS** or **AMI**, then press ENTER.
5. Use the arrow keys to highlight **T1 Frame Type**. Press the SPACEBAR to select **ESF** or **D4**, then press ENTER.
6. Use the arrow keys to highlight **T1 Tx Clock Source**. Press the SPACEBAR to select **Local** (no clock source provided by telephone company) or **Loop** (clock source provided by telephone company), then press ENTER.



If you are using a Local clock source, set only one end of the circuit for Local, the other end must be set for Loop.

7. Use the arrow keys to highlight **T1 Line Buildout (LBO)**. Press the SPACEBAR to select to **0 dB** unless the service provider recommends another setting, then press ENTER.
8. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The message “Save Done!” appears and Local Management saves the changes to memory.

9. Access the WAN Interface Configuration screen by using the arrow keys to highlight the **WAN Int Config** option, then press ENTER.

2.5.2 DELT1-UI Interface Configuration

This screen is accessed through the WAN Physical Configuration screen. Proceed with the following steps to configure the WAN Interface through Local Management.

1. Set the Interface Number that is being used for the WAN connection by typing the same number into the **Interface Number** field that was input into the Timeslots in the WAN Physical Configuration screen, then press ENTER (see the Note in Section 2.3.1 on page 11).
2. Use the arrow keys to highlight **Line Coding**. Press the SPACEBAR to select **None**, then press ENTER.
3. Use the arrow keys to highlight **Active Protocol**. Press the SPACEBAR to select **FR**, then press ENTER.
4. Use the arrow keys to highlight **FR LMP**. Press the SPACEBAR to select **T1.617-D**, then press ENTER.
5. Use the arrow keys to highlight **SAVE**, then press ENTER. The message “Save Done!” appears and Local Management saves the changes to memory.



Upon saving this screen, the interface just configured is assigned to an application port (PT#) in the table on the right hand side of the screen once the device starts communicating with the service provider's switch.

The WAN configuration is complete. Communications between the DELT1-UI and the service provider's switch takes approximately 1 to 2 minutes to begin. A status of **Inactive** appears until both ends of the PVC (Permanent Virtual Circuit) are configured. Once both end devices have negotiated link management with the switches, the status field reads **Active**.

2.6 LEX CONFIGURATION

This section provides step-by-step instructions for configuring the DELT1-UI to operate in a LEX environment. LEX (LAN Extender) is a Cisco Systems protocol that allows a core router to communicate to a remote site using PPP.

The line configuration information shown in [Table 2-4](#) must be supplied by the service provider.

Table 2-4 Telco Configuration Information

Configuration Information Required by User	Configuration Information Supplied by Service Provider
Line Coding	B8ZS or AMI
Frame Type	ESF or D4
Clock Source	Loop Timing or Local Timing

2.6.1 DELT1-UI Physical Configuration

Begin the DELT1-UI configuration by accessing the WAN Configuration screen through Local Management (Figure 2-1). Access the WAN Physical Configuration screen from the Feature Selection screen that first appears when you enter Local Management. Use the arrow keys to highlight the **WAN Configuration** option, then press ENTER. The screen shown in Figure 2-1 appears. Proceed with the following steps:

1. Use the arrow keys to highlight the [WPIM] field at the bottom of the screen. Press the SPACEBAR to select the WPIM being configured, then press ENTER.
2. Use the arrow keys to highlight **Timeslot View**. Press the SPACEBAR to select **New**, then press ENTER. The cursor moves to Timeslot #1 of the Timeslot Configuration Table.
3. Insert an interface number (see the Note below) into every Timeslot being used. Type the number, press ENTER, then use the arrow keys to highlight the next Timeslot field. Exit this field by using the arrow keys. The cursor automatically moves to the **T1 Line Coding** field.



The value assigned to the Timeslots is the interface being used for WAN communication. The available interface range is displayed on the WAN Physical Configuration screen (see Figure 2-1). You may insert any of the available interface numbers into the Timeslots.

In the example shown in Figure 2-1, the interface range for the WPIM with a DELT1-UI in slot one of the WPIM is 2-25. Although any of these values may be used, Digital Equipment Corporation recommends using the first available interface number (in this example interface #2).

The following four steps are based on information supplied by the service provider. Consult the service provider for the correct settings.

4. Use the arrow keys to highlight **T1 Line Coding**. Press the SPACEBAR to select **B8ZS** or **AMI**, then press ENTER.
5. Use the arrow keys to highlight **T1 Frame Type**. Press the SPACEBAR to select **ESF** or **D4**, then press ENTER.
6. Use the arrow keys to highlight **T1 Tx Clock Source**. Press the SPACEBAR to select **Local** (no clock source provided by telephone company) or **Loop** (clock source provided by telephone company), then press ENTER.



If you are using a Local clock source, set only one end of the circuit for Local, the other end must be set for Loop.

7. Use the arrow keys to highlight **T1 Line Buildout (LBO)**. Press the SPACEBAR to select **0 db** unless the service provider recommends another setting, then press ENTER.
8. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The message “Save Done!” appears and Local Management saves the changes to memory.
9. Access the WAN Interface Configuration screen by using the arrow keys to highlight the **WAN Int Config** option, then press ENTER.

2.6.2 DELT1-UI Interface Configuration

This screen is accessed through the WAN Physical Configuration screen. Refer to [Figure 2-4](#) and proceed with the following steps to configure the WAN Interface through Local Management.

1. Set the Interface Number that is being used for the WAN connection by typing the same number into the **Interface Number** field that was input into the Timeslots in the WAN Physical Configuration screen, then press ENTER (see the Note in Section 2.6.1 on page 23).

2. Unless the user sets the Max Xmit Unit, the DELT1-UI automatically sets the **Max Xmit Unit** to **8191** (default) after the active protocol (PPP) is selected.
3. If the T1 Line Coding is **B8ZS** on the previous screen:
 - a. Use the arrow keys to highlight **Line Coding**. Press the SPACEBAR to select **None**, then press ENTER.
 - b. Use the arrow keys to highlight **Active Protocol**. Press the SPACEBAR to select **PPP**, then press ENTER.
 - c. Use the arrow keys to highlight **PPP Type**. Press the SPACEBAR to select **LEX**, then press ENTER.
4. If the T1 Line Coding is **AMI** on the previous screen:
 - a. Use the arrow keys to highlight **Line Coding**. Press the SPACEBAR to select **INV-HDLC**, then press ENTER.
 - b. Use the arrow keys to highlight **Active Protocol**. Press the SPACEBAR to select **PPP**, then press ENTER.
 - c. Use the arrow keys to highlight **PPP Type**. Press the SPACEBAR to select **LEX**, then press ENTER.
5. Use the arrow keys to highlight the **SAVE** command, then press ENTER. The message “Save Done!” appears and Local Management saves the changes to memory.



Upon saving this screen, the interface just configured is assigned to an application port (PT#) in the table on the right hand side of the screen.

The WAN configuration is complete. It takes up to 60 seconds for the WAN Interface to come out of standby and for communications to begin.

APPENDIX A

WAN INTERFACE CABLE SPECIFICATIONS

This appendix provides the part number and connector information for the DELT1-UI Interface Cables.

Table 1-1 lists part numbers for the interface cables available from Cabletron Systems for the DELT1-UI. A standard 20 foot cable is available or the customer may specify the length of cable when ordering.

Table 1-1 Cabletron DELT1-UI Cable Part Numbers

Interface Cable	Cabletron Part Number
T1 Line Interface Cable	9372094-20 ¹
T1 Line Interface Cable	9372094-L ²

1. Standard 20 foot T1 Line Interface Cable.
2. (L denotes length required in feet or meters). For example: 9372094-3 denotes a 3 foot cable; 9372094-3M denotes a 3 meter cable.

A.1 CABLE ASSEMBLIES AND PINOUTS

The following section provides connector information for the DELT1-UI interface cable.

Table 1-2 DELT1-UI Connector Information

Cabletron interface cable part number	9372094-L
Description	T1 line interface cable
Connector 1	RJ48C
Connector 2	RJ48C

Table 1-3 DELT1-UI RJ48 Connector Pin Assignments

Pin	Signal
1	Receive Ring
2	Receive Tip
3	Not Used

Table 1-3 DELT1-UI RJ48 Connector Pin Assignments

Pin	Signal
1	Receive Ring
4	Transmit Ring
5	Transmit Tip
6	Not Used
7	Shield Ground
8	Shield Ground

Table 1-4 RJ48 DTE Pin Assignments

Pin	Signal
1	Receive Ring
2	Receive Tip
3	Not Used
4	Transmit Ring
5	Transmit Tip
6	Not Used
7	Shield Ground
8	Shield Ground

Table 1-5 RJ48 Network Pin Assignments

Pin	Signal
1	Receive Ring
2	Receive Tip
3	Not Used
4	Transmit Ring
5	Transmit Tip
6	Not Used
7	Not Used
8	Not Used

APPENDIX B

FCC PART 68 - USER'S INFORMATION

The following instructions are to ensure compliance with the Federal Communications Commission (FCC) Rules, Part 68.

1. All direct connections to T1 lines must be made using standard plugs and jacks.
2. Before connecting your unit, you must inform the local telephone company of the following information:

Port ID	REN/SOC	FIC	USOC
DELT1-UI	6.0N	04DU9-BN 04DU9-DN 04DU9-1KN 04DU9-1SN 04DU9-1ZN	RJ48C

3. If the unit appears to be malfunctioning, it should be disconnected from the telephone lines until you learn if your equipment or the telephone line is the source of the trouble. If your equipment needs repair, it should not be reconnected until it is repaired.
4. The CSU/DSU has been designed to prevent harm to the T1 network. If the telephone company finds that the equipment is exceeding tolerable parameters, the telephone company can temporarily disconnect service, although they will attempt to give advance notice if possible.
5. Under the FCC Rules, no customer is authorized to repair this equipment. This restriction applies regardless of whether the equipment is in or out of warranty.
6. If the telephone company alters their equipment in a manner that will affect use of this device, they must give you advance warning so as to give you the opportunity for uninterrupted service. You will be advised of your right to file a complaint with the FCC.

7. The attached affidavit must be completed by the installer.
8. In the event of equipment malfunction, all repairs should be performed by our Company or an authorized agent. It is the responsibility of the users requiring service to report the need for service to our Company or to one of our authorized agents.

For service contact your DIGITAL representative.

**AFFIDAVIT FOR THE CONNECTION OF
CUSTOMER EQUIPMENT TO 1.544 MBPS AND/OR
SUBRATE DIGITAL SERVICES**

For the work to be performed in the certified territory of

Telco's name: _____

State of: _____

Country of: _____

I, _____, of _____
(Name of Authorized Representative) (Customer Name)

_____, _____
(Customer's Address) (Telephone Number)

being duly sworn, state:

I have responsibility for the operation and maintenance of the terminal equipment to be connected to _____ 1.544 Mbps and/or _____ Subrate digital services. The terminal equipment to be connected complies with Part 68 of the Commission's rules except for the encoded analog content and billing protection specifications. With respect to encoded analog content and billing protection:

- I attest that all operations associated with the establishment, maintenance and adjustment of the digital CPE with respect to encoded analog content and encoded billing information continuously complies with Part 68 of the FCC's Rules and Regulations.
- The digital CPE does not transmit digital signals containing encoded analog or billing information which is intended to be decoded within the telecommunications network.
- The encoded analog and billing protection is factory set and is not under the control of the customer.

Appendix B: FCC Part 68 - User's Information

I attest that the operator(s) maintainer(s) of the digital CPE responsible for the establishment, maintenance and adjustment of the encoded analog content and billing information has (have) been trained to perform these functions by successfully completing one of the following: Check appropriate one(s).

- a. A training course provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- b. A training course provided by the customer or authorized representative, using training materials and instructions provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- c. An independent training course (e.g. trade school or technical institution) recognized by the manufacturer/grantee of the equipment used to encode analog signals; or
- d. In lieu of the proceeding training requirements, the operator(s) maintainer(s) is (are) under the control of a supervisor trained in accordance with _____ above.

I agree to provide _____ with proper documentation
(Telco's Name)

to demonstrate compliance with the information as provided in the proceeding paragraph, if so requested.

_____ (Signature)

_____ (Title)

_____ (Date)

Subscribed and sworn to me this _____ day of _____, 19____.

(Notary Public)

My commission expires: _____

APPENDIX C

WAN TERMS AND ACRONYMS

This appendix provides definitions for WAN terms and acronyms.

AMI	Alternate Mark Inversion, line coding used with both E-1 and T-1. A digital 1 is encoded as a "mark" (pulse) and a 0 is encoded as a "space." The marks alternate polarity.
ANSI	American National Standards Institute, the US member of the ISO.
Bearer (B) Channel	A 64 Kbps channel used with BRI and PRI ISDN services.
Bipolar Violation	The occurrence of two successive pulses of the same polarity in a bipolar signal.
B8ZS	Binary 8-Zero Substitution, line coding utilized with ESF (Expanded Super Frame). Insures the ones density requirement for digital T-carrier facilities in the public network, while allowing 64 Kbps clear data per channel. This encoding method is not supported by some Telcos.
BRI	Basic Rate Interface, minimum rate ISDN subscriber interface, provides 2 B + 1 D channels (two 64 Kbps "B" (Bearer) channels and one 16 Kbps "D" (Data) signaling channel for a total of 144 Kbps).
CRC	Cyclic Redundancy Check, an algorithm or process used to identify corrupted packets in the transmission link.
CSU	Channel Service Unit, a device that terminates the local loop/digital channel on a customer's (DSU) premises. The CSU connects to a DSX-1 interface on the CPE.
DCE	Data Communications Equipment, a device such as a modem that connects the communications circuit with the end device (see DTE).
Data (D) Channel	A 16 Kbps channel used with BRI and PRI services for signaling and control.
D4	D4 Framing, a popular framing format in T-1. Uses 12 T-1 Frames to identify both the channel and the signaling bit.

DLCI	Data Link Connection Identifier, a unique virtual circuit identifier used in Frame Relay. Identifies a given frame as being from a particular logical link. The DLCI has only local significance.
DSU	Digital Service Unit, converts RS-232 or other terminal interfaces to DSX-1 (T-1) interface.
DS-0	Digital Signal, level 0, a standard 64,000 bit/second channel. Synonymous with "Timeslot."
DTE	Data Terminal Equipment, equipment that originates and terminates data transmission such as a computer or printer (see DCE).
E-1	European digital signal level 1. Similar to T-1 but provides 32 channels (2.048 Mbps) instead of 24 channels (1.544 Mbps).
ESF	Extended Super Frame. A new T-1 framing standard (see D4 framing) that uses 24 T-1 frames, thus allowing individual identification of the channel and signaling bits.
Fractional T-1	Use of a portion (less than the full 24 channels) of a T-1 line.
Frame Relay	A network protocol that allows for many point-to-point virtual connections over a single access channel.
HDB3	High Density Bipolar 3, used with E-1, a bipolar coding method that does not allow more than 3 consecutive zeros.
HDLC	High-Level Data Link Control, layer 2 (link layer) full-duplex protocol derived from SDLC.
INV. HDLC	A form of zero suppression in which all zeros in the HDLC packet are changed to ones and all ones are changed to zeros.
ISDN	Integrated Services Digital Network. Allows point-to-point connections at 64 Kbps or 128 Kbps when necessary and disconnects the line when not in use. With this service the user only pays for the time connected.
JBZS	Jam Bit-Zero Suppression, a form of zero suppression that places a one in the seventh bit of a timeslot. Reduces the effective throughput to 56 Kbps.
LEX	LAN Extender, a Cisco Systems protocol used to internetwork a host-based router with a remote switch.

LMP	Link Management Protocol, used in Frame Relay. Allows the device to gather information about the DLCIs (Data Link Connection Identifiers) See T1.617-D, Q.933-A.
Local Timing	Timing for digital transmission circuit is internally generated by a source within the equipment. Usually used for short haul private lines. In this case one CSU must be set for Local (internal) timing and the CSU at the other end of the line must be set for Loop (recovered) timing to create a master-slave situation.
Loop Timing	Timing for digital transmission circuit is recovered from the received data, not generated internally by a source within the equipment. This is the typical situation when using public lines.
MUX	Multiplexer, an electronic device that allows two or more signals to pass over one communications circuit.
PPP	Point-to-Point Protocol, provides a method for transmitting datagrams over serial point-to-point links.
PRI	Primary Rate Interface, an ISDN service providing 23 "B" (Bearer) channels of 64 Kbps and one 64 Kbps "D" (Data) channel for signaling and control.
PVC	Permanent Virtual Circuit, a virtual circuit that provides the equivalent of a dedicated private line service.
Q.933-A	Q.933 Annex A, an ITU link management protocol specification used in Frame Relay.
SDLC	Synchronous Data Link Control, layer 2 (link layer) protocol developed by IBM for SNA connectivity. Basis for HDLC.
SNA	Systems Network Architecture, data communication network architecture developed by IBM in the 1970's.
T-1	A Bell System term that refers to the physical carrier used to transmit a digital signal at 1.544 Mbps.
T1.617-D	T1.617 Annex D, an ANSI link management protocol specification used in Frame Relay.
TDM	Time Division Multiplexing, a technique in which separate data or voice signals are transmitted simultaneously over a single communications medium based on time interleaving.
Timeslot	A standard 64,000 bit/second channel. Synonymous with DS-0 (Digital Signal, level 0).

Appendix C: WAN Terms and Acronyms

WAN	Wide Area Network, a network spanning a large geographic area.
WPIM	WAN Physical Interface Module, modules that provide connectivity/functionality for WAN modules.

digital