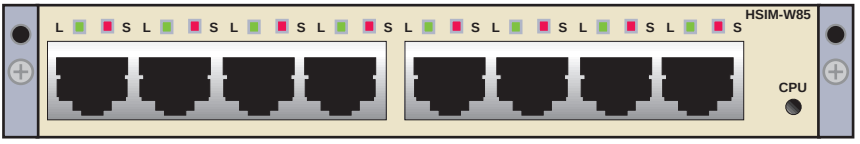
HSIM-W85
User's Guide



9032842-01

CABLETRON SYSTEMS

Only qualified personnel should perform installation procedures.

NOTICE

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.

CAUTION: THE HSIM-W85 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.

CAUTION: 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.

© 1999 by Cabletron Systems, Inc., P.O. Box 5005, Rochester, NH 03866-5005
All Rights Reserved
Printed in the United States of America

Part Number: 9032842-01 March 1999

Cabletron Systems and **LANVIEW** are registered trademarks of Cabletron Systems, Inc.

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

FCC NOTICE

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment uses, generates, and can radiate radio frequency energy and if not installed in accordance with the operator's manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his own expense.

WARNING: Changes or modifications made to this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

INDUSTRY CANADA 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.

CAUTION: 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

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

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。

CABLETRON SYSTEMS, INC.
PROGRAM LICENSE AGREEMENT

IMPORTANT: THIS LICENSE APPLIES FOR USE OF PRODUCT IN THE UNITED STATES OF AMERICA AND BY UNITED STATES OF AMERICA GOVERNMENT END USERS.

BEFORE OPENING OR UTILIZING THE ENCLOSED PRODUCT, CAREFULLY READ THIS LICENSE AGREEMENT.

This document is an agreement (“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 (“Program”) in the package. The Program may be contained in firmware, chips or other media. 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, RETURN THE UNOPENED PRODUCT TO CABLETRON OR YOUR DEALER, IF ANY, WITHIN TEN (10) DAYS FOLLOWING THE DATE OF RECEIPT FOR A FULL REFUND.

IF YOU HAVE ANY QUESTIONS ABOUT THIS AGREEMENT, CONTACT CABLETRON SYSTEMS (603) 332-9400. Attn: Legal Department.

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.

4. EXPORT REQUIREMENTS. You understand that Cabletron and its Affiliates are subject to regulation by agencies of the U.S. Government, including the U.S. Department of Commerce, which prohibit export or diversion of certain technical products to certain countries, unless a license to export the product is obtained from the U.S. Government or an exception from obtaining such license may be relied upon by the exporting party.

If the Program is exported from the United States pursuant to the License Exception CIV under the U.S. Export Administration Regulations, You agree that You are a civil end user of the Program and agree that You will use the Program for civil end uses only and not for military purposes.

If the Program is exported from the United States pursuant to the License Exception TSR under the U.S. Export Administration Regulations, in addition to the restriction on transfer set forth in Sections 1 or 2 of this Agreement, You agree not to (i) reexport or release the Program, the source code for the Program or technology to a national of a country in Country Groups D:1 or E:2 (Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Cambodia, Cuba, Estonia, Georgia, Iraq, Kazakhstan, Kyrgyzstan, Laos, Latvia, Libya, Lithuania, Moldova, North Korea, the People's Republic of China, Romania, Russia, Rwanda, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam, or such other countries as may be designated by the United States Government), (ii) export to Country Groups D:1 or E:2 (as defined herein) the direct product of the Program or the technology, if such foreign produced direct product is subject to national security controls as identified on the U.S. Commerce Control List, or (iii) if the direct product of the technology is a complete plant o r any major component of a plant, export to Country Groups D:1 or E:2 the direct product of the plant or a major component thereof, if such foreign produced direct product is subject to national security controls as identified on the U.S. Commerce Control List or is subject to State Department controls under the U.S. Munitions List.

5. UNITED STATES GOVERNMENT RESTRICTED RIGHTS. The enclosed Product (i) was developed solely at private expense; (ii) contains "restricted computer software" submitted with restricted rights in accordance with section 52.227-19 (a) through (d) of the Commercial Computer Software-Restricted Rights Clause and its successors, and (iii) in all respects is proprietary data belonging to Cabletron and/or its suppliers. For Department of Defense units, the Product is considered commercial computer software in accordance with DFARS section 227.7202-3 and its successors, and use, duplication, or disclosure by the Government is subject to restrictions set forth herein.

6. 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.

7. 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 IN THE DURATION OR LIMITATION OF IMPLIED WARRANTIES IN SOME INSTANCES, THE ABOVE LIMITATION AND EXCLUSIONS MAY NOT APPLY TO YOU.

CABLETRON SYSTEMS SALES AND SERVICE, INC. PROGRAM LICENSE AGREEMENT

IMPORTANT: THIS LICENSE APPLIES FOR USE OF PRODUCT IN THE UNITED STATES OF AMERICA AND BY UNITED STATES OF AMERICA GOVERNMENT END USERS.

BEFORE OPENING OR UTILIZING THE ENCLOSED PRODUCT, CAREFULLY READ THIS LICENSE AGREEMENT.

This document is an agreement ("Agreement") between You, the end user, and Cabletron Systems Sales and Service, Inc. ("Cabletron") that sets forth your rights and obligations with respect to the Cabletron software program ("Program") in the package. The Program may be contained in firmware, chips or other media. 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, RETURN THE UNOPENED PRODUCT TO CABLETRON OR YOUR DEALER, IF ANY, WITHIN TEN (10) DAYS FOLLOWING THE DATE OF RECEIPT FOR A FULL REFUND.

IF YOU HAVE ANY QUESTIONS ABOUT THIS AGREEMENT, CONTACT CABLETRON SYSTEMS (603) 332-9400. Attn: Legal Department.

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.

4. EXPORT REQUIREMENTS. You understand that Cabletron and its Affiliates are subject to regulation by agencies of the U.S. Government, including the U.S. Department of Commerce, which prohibit export or diversion of certain technical products to certain countries, unless a license to export the product is obtained from the U.S. Government or an exception from obtaining such license may be relied upon by the exporting party.

If the Program is exported from the United States pursuant to the License Exception CIV under the U.S. Export Administration Regulations, You agree that You are a civil end user of the Program and agree that You will use the Program for civil end uses only and not for military purposes.

If the Program is exported from the United States pursuant to the License Exception TSR under the U.S. Export Administration Regulations, in addition to the restriction on transfer set forth in Sections 1 or 2 of this Agreement, You agree not to (i) reexport or release the Program, the source code for the Program or technology to a national of a country in Country Groups D:1 or E:2 (Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Cambodia, Cuba, Estonia, Georgia, Iraq, Kazakhstan, Kyrgyzstan, Laos, Latvia, Libya, Lithuania, Moldova, North Korea, the People's Republic of China, Romania, Russia, Rwanda, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam, or such other countries as may be designated by the United States Government), (ii) export to Country Groups D:1 or E:2 (as defined herein) the direct product of the Program or the technology, if such foreign produced direct product is subject to national security controls as identified on the U.S. Commerce Control List, or (iii) if the direct product of the technology is a complete plant o r any major

component of a plant, export to Country Groups D:1 or E:2 the direct product of the plant or a major component thereof, if such foreign produced direct product is subject to national security controls as identified on the U.S. Commerce Control List or is subject to State Department controls under the U.S. Munitions List.

5. UNITED STATES GOVERNMENT RESTRICTED RIGHTS. The enclosed Product (i) was developed solely at private expense; (ii) contains "restricted computer software" submitted with restricted rights in accordance with section 52.227-19 (a) through (d) of the Commercial Computer Software-Restricted Rights Clause and its successors, and (iii) in all respects is proprietary data belonging to Cabletron and/or its suppliers. For Department of Defense units, the Product is considered commercial computer software in accordance with DFARS section 227.7202-3 and its successors, and use, duplication, or disclosure by the Government is subject to restrictions set forth herein.

6. 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.

7. 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 IN THE DURATION OR LIMITATION OF IMPLIED WARRANTIES IN SOME INSTANCES, THE ABOVE LIMITATION AND EXCLUSIONS MAY NOT APPLY TO YOU.

CABLETRON SYSTEMS LIMITED PROGRAM LICENSE AGREEMENT

IMPORTANT: THIS LICENSE APPLIES FOR USE OF PRODUCT IN THE UNITED STATES OF AMERICA AND BY UNITED STATES OF AMERICA GOVERNMENT END USERS.

BEFORE OPENING OR UTILIZING THE ENCLOSED PRODUCT, CAREFULLY READ THIS LICENSE AGREEMENT.

This document is an agreement ("Agreement") between You, the end user, and Cabletron Systems Limited ("Cabletron") that sets forth your rights and obligations with respect to the Cabletron software program ("Program") in the package. The Program may be contained in firmware, chips or other media. 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, RETURN THE UNOPENED PRODUCT TO CABLETRON OR YOUR DEALER, IF ANY, WITHIN TEN (10) DAYS FOLLOWING THE DATE OF RECEIPT FOR A FULL REFUND.

IF YOU HAVE ANY QUESTIONS ABOUT THIS AGREEMENT, CONTACT CABLETRON SYSTEMS (603) 332-9400. Attn: Legal Department.

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 governed in accordance with English law. The English courts shall have exclusive jurisdiction in the event of any disputes.

4. EXPORT REQUIREMENTS. You understand that Cabletron and its Affiliates are subject to regulation by agencies of the U.S. Government, including the U.S. Department of Commerce, which prohibit export or diversion of certain technical products to certain countries, unless a license to export the product is obtained from the U.S. Government or an exception from obtaining such license may be relied upon by the exporting party.

If the Program is exported from the United States pursuant to the License Exception CIV under the U.S. Export Administration Regulations, You agree that You are a civil end user of the Program and agree that You will use the Program for civil end uses only and not for military purposes.

If the Program is exported from the United States pursuant to the License Exception TSR under the U.S. Export Administration Regulations, in addition to the restriction on transfer set forth in Sections 1 or 2 of this Agreement, You agree not to (i) reexport or release the Program, the source code for the Program or technology to a national of a country in Country Groups D:1 or E:2 (Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Cambodia, Cuba, Estonia, Georgia, Iraq, Kazakhstan, Kyrgyzstan, Laos, Latvia, Libya, Lithuania, Moldova, North Korea, the People's Republic of China, Romania, Russia, Rwanda, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam, or such other countries as may be designated by the United States Government), (ii) export to Country Groups D:1 or E:2 (as defined herein) the direct product of the Program or the technology, if such foreign produced direct product is subject to national security controls as identified on the U.S. Commerce Control List, or (iii) if the direct product of the technology is a complete plant o r any major component of a plant, export to Country Groups D:1 or E:2 the direct product of the plant or a major component thereof, if such foreign produced direct product is subject to national security controls as identified on the U.S. Commerce Control List or is subject to State Department controls under the U.S. Munitions List.

5. UNITED STATES GOVERNMENT RESTRICTED RIGHTS. The enclosed Product (i) was developed solely at private expense; (ii) contains "restricted computer software" submitted with restricted rights in accordance with section 52.227-19 (a) through (d) of the Commercial Computer Software-Restricted Rights Clause and its successors, and (iii) in all respects is proprietary data belonging to Cabletron and/or its suppliers. For Department of Defense units, the Product is considered commercial computer software in accordance with DFARS section 227.7202-3 and its successors, and use, duplication, or disclosure by the Government is subject to restrictions set forth herein.

6. 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.

7. 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 IN THE DURATION OR LIMITATION OF IMPLIED WARRANTIES IN SOME INSTANCES, THE ABOVE LIMITATION AND EXCLUSIONS MAY NOT APPLY TO YOU.

CONTENTS

CHAPTER 1 INTRODUCTION

1.1 Firmware Revision 1-1
1.2 Using This Manual 1-2
1.3 Overview 1-3
1.4 Data Flow in the HSIM-W85 1-4
1.5 Features 1-4
1.5.1 Connectivity 1-5
1.5.2 HDLC 1-5
1.5.3 Inverse Multiplexing (IMUX) 1-6
1.5.4 Priority Queuing 1-6
1.5.5 DS1 Alarm 1-7
1.5.6 SNMP and MIB Support 1-7
1.5.7 LANVIEW Diagnostic LEDs 1-7
1.6 Document Conventions 1-8
1.7 Related Documentation 1-9
1.8 Getting Help 1-10

CHAPTER 2 INSTALLATION

2.1 Unpacking the HSIM-W85 2-1
2.2 Installing the HSIM-W85 2-2
2.2.1 Installing the HSIM-W85 in an Interface Module 2-2
2.2.2 Installing the HSIM-W85 in a Standalone Device 2-5
2.3 Connecting the HSIM-W85 to the Network 2-6

CHAPTER 3 LANVIEW LEDs

3.1 LANVIEW LEDs 3-1

CHAPTER 4 MANAGEMENT

4.1 Local Management 4-1
4.2 Network Tools 4-3
4.2.1 Commands 4-4
4.2.2 Built-in Commands 4-7
4.2.3 Special Commands 4-14
4.3 Sample IMUX Configuration 4-15

CHAPTER 5 TROUBLESHOOTING

5.1 Troubleshooting the HSIM-W85 5–1
5.1.1 Hardware Troubleshooting 5–1
5.1.2 Investigating Software Configuration Problems 5–3
5.1.3 Problems with the Firmware Image 5–3

APPENDIX A SPECIFICATIONS

A.1 Physical Properties A-1
A.2 Environmental Requirements A-2
A.3 Regulatory Compliance A-2

APPENDIX B TYPICAL CONFIGURATION

APPENDIX C FCC PART 68 - USER'S INFORMATION

CHAPTER 1

INTRODUCTION

Welcome to the Cabletron Systems **HSIM-W85 User's Guide**. This manual describes the HSIM-W85 and provides information concerning features, installation, the use of management, troubleshooting, and specifications.

A general working knowledge of Wide Area Networking (WAN), including T1 Networking, Ethernet and data communications networks, and their physical layer components is helpful when installing this device.

The HSIM-W85 has 8 RJ45 T1 ports. Figure 1-1 shows the HSIM-W85.

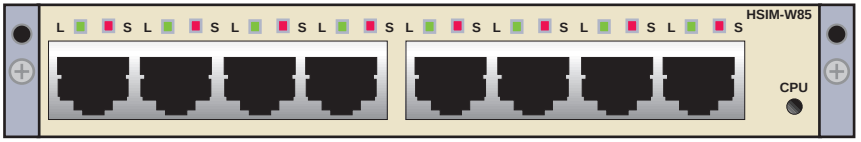


Figure 1-1 HSIM-W85

1.1 FIRMWARE REVISION

Important Notice

Depending on the firmware version used in the HSIM-W85, some features described in this document may not be supported. Refer to the Release Notes shipped with the HSIM-W85 to determine which features are supported.

This manual covers Firmware Revision level 04.08.XX. Later revisions may be reflected in an updated manual. Please verify the revision level of your device, to ensure that this manual meets your needs.

1.2 USING THIS MANUAL

Reading through this manual completely will help you understand the features and capabilities of the HSIM-W85. The following list provides an overview of each section of this manual:

Chapter 1, **Introduction**, outlines the contents of this manual, describes the HSIM-W85 features and provides information on how to obtain related manuals and technical support.

Chapter 2, **Installation**, describes how to install an HSIM-W85 into an interface module or a standalone device (host platform).

NOTE

The term “host platform” is used to describe the interface module, or standalone device, into which the HSIM-W85 can be installed.

Chapter 3, **LANVIEW LEDs**, describes how to use the HSIM-W85 LEDs to monitor performance and status.

Chapter 4, **Management**, describes the Network Tools needed for configuration of the HSIM-W85.

Chapter 5, **Troubleshooting**, describes some of the common troubleshooting problems and possible solutions.

Appendix A, **Specifications**, lists the operating specifications and regulatory compliance of the HSIM-W85.

Appendix B, **Typical Configuration**, displays possible configurations for the HSIM-W85.

Appendix C, FCC PART 68 - User’s Information, explains the FCC rules for the HSIM-W85.

1.3 OVERVIEW

The HSIM-W85 extends the functionality of certain Cabletron Systems platforms by providing an interface for Wide Area Network (WAN) DS1 services. The HSIM-W85 is a High Speed Interface Module (HSIM) used to provide WAN services using the SmartSwitch series of products as a platform. The HSIM-W85 has 8 physical DS1 interfaces, providing 8 separate logical DS1 connections. Eight separate T1 circuits can be configured, or the circuits can be combined into various Inverse Multiplexing (IMUX) groupings, up to a 12 Mbps full duplex data circuit within a Layer 2 IMUX group.

The typical configuration is a head-end WAN aggregation point for up to 8 T1s into a single WAN physical interface. The HSIM-W85 is able to uplink any combination of single T1s or multiple T1 IMUX groups to the backbone. Refer to Appendix B for a diagram of a typical configuration.

The HSIM-W85 has its own i960 HD microprocessor used to process data packets, provide simple configuration, Inverse Multiplexer functionality, and statistics processing. The SmartSwitch host platform provides the required logical IP Host services. The HSIM-W85 is designed to be installed in any Cabletron Systems product that supports the High Speed Interface Module.

The HSIM-W85 operates in two modes:

- Switching
- IMUX

The first mode, switching, is the default mode. The HSIM-W85 forwards data packets received by the host platform out through the logical DS1 interfaces. It also forwards packets received in the DS1 interfaces to or through the host. The default and only layer 2 WAN protocol used with the HSIM-W85 is raw HDLC.

NOTE

The host platform may operate in 802.1D bridging, 802.1Q VLAN, or SecureFast mode.

The second mode of operation is using Cabletron Systems Inverse Multiplexer (IMUX) functionality to aggregate multiple DS1 connections into single higher bandwidth WAN connections. To operate in this mode, the user configures the appropriate IMUX groups containing the DS1 connections.

Along with the built-in management features (Network Tools) described in Chapter 4, the HSIM-W85 can be managed using SNMP. Statistical data can be accessed via SNMP by referencing the interface group defined in RFC 1213.

1.4 DATA FLOW IN THE HSIM-W85

The T1 data streams are terminated by T1 framers, which provide an HDLC bit stream to the HDLC controller. The controller receives data packets from each of the bit streams and places them in a memory subsystem. The on board CPU examines the packet and notifies the host of its arrival. Finally, a Cabletron proprietary ASIC transfers the data to the host platform.

This process is followed in reverse when a packet is transmitted from the host platform out the T1 ports. The host platform notifies the HSIM-W85 when a packet is coming and transfers the packet to the memory. The HDLC format is applied to the data, then the data is framed to a T1 format, and passed to the framer. The T1 data is transmitted out through the T1 interface.

1.5 FEATURES

The following are some of the highlights of the HSIM-W85 features:

- Data Transfer Rates of 12 Mbps in full duplex, when running all eight T1s carrying continuous data traffic of 64-byte packets or larger.
- High-level Data Link Control (HDLC) protocol
- T1 Inverse Multiplexing (IMUX)
- WAN IP Priority Queuing functionality
- DS1 Alarm Thresholds
- SNMP support

- DS1 MIB Support
- LANVIEW LEDs

1.5.1 Connectivity

The HSIM-W85 module supports WAN technology using eight live full duplex T1 connections.

The primary function of the HSIM-W85 is to provide LAN-to-WAN access. WAN physical connectivity will be supported through the use of a T1 interface. LAN-to-WAN connectivity will be supported through HDLC and T1 Inverse Multiplexing (IMUX).

The HSIM-W85 interoperates with those Cabletron Systems WAN products that support raw HDLC as the WAN protocol. This support is limited to the CyberSWITCH product line which supports HDLC:

- CSX400 – Version 02.00.15 or higher
- HSIM-W6 – Version 02.00.15 or higher
- HSIM-W84 – Version 02.00.xx or higher
- HSIM-W87 – SSR 2200 Version 04.05.06 or higher

1.5.2 HDLC

The High-level Data Link Control (HDLC) protocol is used in conjunction with the Inverse Multiplexing (IMUX) feature to conserve a user's WAN bandwidth between two Cabletron Systems products, over a point-to-point connection. Cabletron Systems products such as the HSIM-W6, HSIM-W84, HSIM-W85, HSIM-W87, and CSX400 must be in use on both ends of the WAN link for these functions to work. The HDLC (RAW) protocol reduces the amount of overhead information that needs to be contained within each data packet to direct it to its destination. This decreased packet overhead provides the IMUX functions with more bandwidth to transfer user data.

1.5.3 Inverse Multiplexing (IMUX)

Cabletron Systems Inverse Multiplexing (IMUX) feature provides enhanced throughput for users by following this process:

- The IMUX function evenly distributes a data packet stream from the LAN interface through multiple full T1 WAN interfaces on the HSIM-W85.
- Data packet streams received by the WAN interfaces on the other end of the WAN links are then recombined, ordered, and transmitted to the LAN interface.

The IMUX function is configured using the Network Tools command, imux, described in Chapter 4.

NOTE

Cabletron Systems products that support Inverse Multiplexing (IMUX), such as the HSIM-W6, CSX400, HSIM-W84, HSIM-W85, and HSIM-W87, must exist on both ends of the WAN link for the IMUX function to work. All bridging and switching functions, such as 802.1D, SecureFast VLAN, and 802.1Q are able to run as normal on the host platform when using the IMUX function on the HSIM-W85.

1.5.4 Priority Queuing

WAN IP Priority Queuing is used to prioritize IP packets from a specified IP address. This prioritizing ensures that certain packets get through the network, such as management packets which are necessary to the operation of the network. It also ensures that routers that depend on protocols with tight timing, such as RIP, do not time out. The prioritized packets do not eliminate other traffic on the network, but are held in a special queue, so that they are not discarded during oversubscribed traffic peaks. Priority Queuing can be enabled in management, using Network Tools. Refer to the wanpq command in the **Management** chapter.

1.5.5 DS1 Alarm

The DS1 Error Threshold Alarm Monitor allows the user to set error thresholds. The monitor notifies the user of potential DS1 problems with SNMP trap events.

The ds1alarm Monitor feature can be enabled in management, using Network Tools. Refer to the ds1alarm command in the **Management** chapter.

1.5.6 SNMP and MIB Support

With SNMP support, the MIBs supported by the HSIM-W85 include:

- RFC 1406 – Definitions of Managed Objects for the DS1 and E1 Interface Types
- RFC 1213 (MIB II) support for the Interface Table
- Cabletron Enterprise MIBs
- RFC 2233 – Support for the Interface Stack Table

Refer to the Release Notes included with the host platform for a list of all MIBs supported by the HSIM-W85. For information about how to extract and compile individual MIBs, contact Cabletron Systems (Section 1.8).

1.5.7 LANVIEW Diagnostic LEDs

Cabletron Systems provides a visual diagnostic and monitoring system called LANVIEW. The HSIM-W85 LANVIEW LEDs help you quickly identify status of the device. Chapter 3 provides information on the HSIM-W85 LEDs. The host platform LEDs may also indicate information for the HSIM-W85. Refer to the appropriate host platform manual for further information on the host platform LEDs.

1.6 DOCUMENT CONVENTIONS

The following conventions are used throughout this document:

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.

Tip symbol. Conveys helpful hints concerning procedures or actions.

bold type	Denotes either a user input or a highlighted screen selection.
RETURN	Indicates either the ENTER or RETURN key, depending on your keyboard.
ESC	Indicates the keyboard Escape key.
SPACE bar	Indicates the keyboard space bar key.
BACKSPACE	Indicates the keyboard backspace key.
arrow keys	Refers to the four keyboard arrow keys.
[-]	Indicates the keyboard – key.
DEL	Indicates the keyboard delete key.
italic type	Italic type emphasizes important information, indicates variables, and indicates complete document titles.
n.nn	A period in numerals signals the decimal point indicator (e.g., 1.75 equals one and three fourths), or the Decimal Dotted Notation (DDN) for an IP address.
x	Indicates the generic use of a letter (e.g., *xxx* indicates any combination of three alphabetic characters).

n	Indicates the generic use of a number (e.g., 19*nn* indicates a four-digit number in which the last two digits are unknown).
[]	In the Local Management screens, the brackets indicate that a value may be entered or selected. In the format descriptions in the Network Tools section, required arguments are enclosed in [].
<>	In the format descriptions in the Network Tools section, optional arguments are enclosed in <>.

1.7 RELATED DOCUMENTATION

The documentation for the host platform in which the HSIM-W85 is to be installed provides additional information about the setup of the HSIM-W85. The host documentation is not listed below, as there can be many different host platforms. This user's guide may reference procedures in these documents, where appropriate, but does not repeat them.

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

http://www.cabletron.com/

1.8 GETTING HELP

For additional support related to this device or document, contact Cabletron Systems using the following methods:

World Wide Web	http://www.cabletron.com/
Phone	(603) 332-9400
Internet mail	support@cabletron.com
FTP Login Password	ftp://ftp.cabletron.com/ *anonymous* *your email address*
To send comments or suggestions concerning this document, contact the Cabletron Systems Technical Writing Department via the following email address: **TechWriting@cabletron.com** *Make sure to include the document Part Number in the email message.*	

Before calling Cabletron Systems, have the following information ready:

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

CHAPTER 2

INSTALLATION

To install the HSIM-W85 the following items are required:

- Antistatic wrist strap (shipped with the HSIM-W85)
- Phillips screwdriver

NOTE

Before attempting to use the HSIM-W85 you should be familiar with the *IEEE 802.3 Specifications,* and T1 Networking.

2.1 UNPACKING THE HSIM-W85

CAUTION

The HSIM-W85 and the host platform are sensitive to static discharges. Use an antistatic strap and observe all static precautions during this procedure. Failure to do so could result in damage to the HSIM-W85 or host platform.

Unpack the HSIM-W85 as follows:

1. Remove the HSIM-W85 from the shipping box.
2. Leave the module in its antistatic bag until you are ready to install it.
3. Attach the antistatic wrist strap (refer to the instructions on the antistatic wrist strap package for proper use).
4. After removing the module from its antistatic bag, visually inspect the device. If you notice any signs of damage, contact Cabletron Systems immediately. Refer to Section 1.8 for instructions. Save the antistatic bag in the event the module must be reshipped or relocated.

2.2 INSTALLING THE HSIM-W85

Only qualified personnel should install or service this unit.

An HSIM-W85 can be installed in any Cabletron Systems device that supports HSIM technology (e.g., 2H252-25R, 2E42-27, 6E132-25).

NOTE

Refer to the release notes for the version of firmware running on the Cabletron Systems host platform to ensure that the HSIM-W85 is supported.

The following subsections provide instructions for installing an HSIM-W85 in a host platform. Refer to the specific interface module or standalone device manual for exact HSIM slot and connector locations.

2.2.1 Installing the HSIM-W85 in an Interface Module

To install an HSIM-W85 in an interface module that supports HSIM technology, perform the following steps.

1. Note the ports of the interface module that have cables attached to them. Write down the ports and label the cables to make it easier to reattach the network properly after the installation. Then disconnect those cables from the ports.
2. Attach the antistatic wrist strap (refer to the instructions outlined on the antistatic wrist strap package).
3. If the interface module is installed in a chassis, unlock the top and bottom plastic locking tabs of the module faceplate.
4. Remove the module from the chassis, and place it down flat with the internal components facing up.
5. Remove and save the two faceplate mounting screws securing the HSIM coverplate and remove the coverplate. See Figure 2-1.

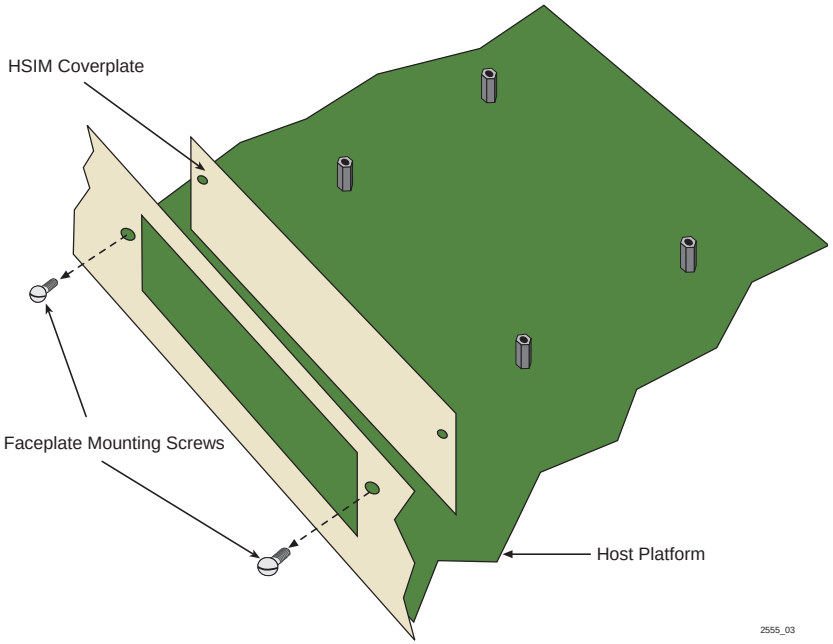


Figure 2-1 Removing the HSIM Coverplate

6. Refer to Figure 2-2 and place the HSIM-W85 behind the module faceplate.

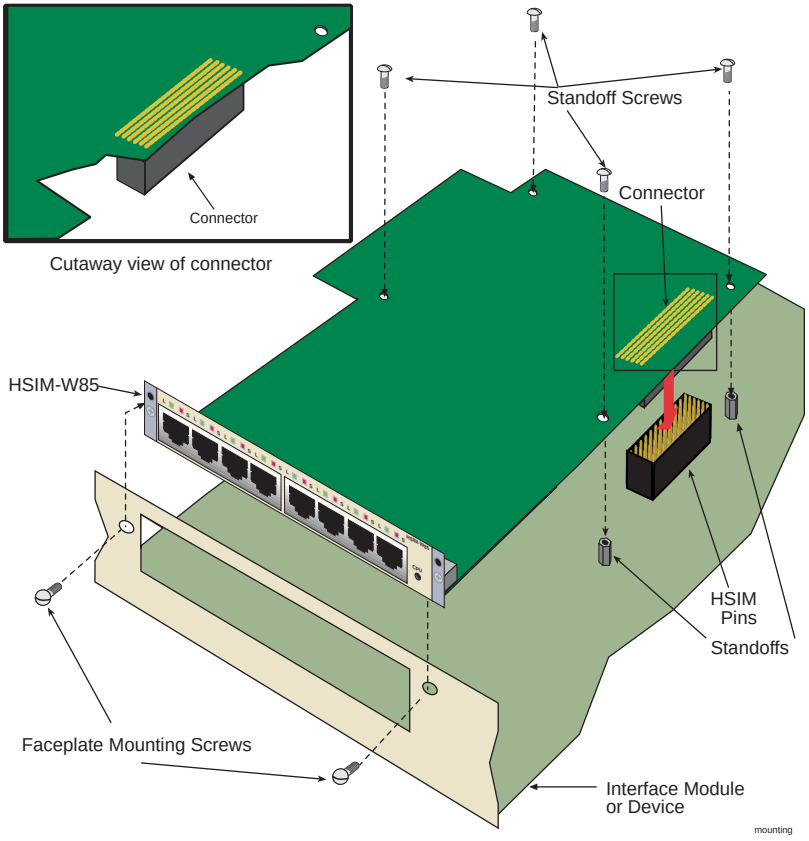


Figure 2-2 Installing the HSIM-W85

7. Align the connector on the HSIM-W85 with the pins on the module.

CAUTION Ensure that the HSIM-W85 connector aligns with the module connector pins to prevent bending the pins. This can damage both the HSIM-W85 and the module.

8. Press down firmly on the connector area of the HSIM-W85 until the connector slides all the way onto the pins. Ensure that the standoffs on the interface module align with the standoff screw holes on the HSIM-W85.

9. Secure the HSIM-W85 to the module faceplate using the mounting screws saved in step 5.

10. Secure the HSIM-W85 to the module standoffs using the standoff screws included in the HSIM-W85 shipping materials.
11. Reinstall the interface module in the chassis.
12. Reattach the network cabling to the interface module.

2.2.2 Installing the HSIM-W85 in a Standalone Device

To install an HSIM-W85 into a standalone device (e.g., 2H252-25R) perform the following steps:

1. Power down the device and remove the power cord.
2. Note the ports that have cables attached to them. Write down the ports and label the cables to make it easier to reattach the network properly after the installation. Then disconnect those cables from the ports.

To install the HSIM-W85 in a standalone device, the device must first be powered down. Ensure that you remove the power cord and ONLY the screws required to remove the chassis cover.

3. Attach the antistatic wrist strap (refer to the instructions outlined on the antistatic wrist strap package).
4. Remove the standalone device chassis cover (refer to your specific standalone device documentation for instructions on removing the chassis cover).
5. Refer back to Figure 2-1 and remove the two faceplate mounting screws and the HSIM coverplate. Save the screws.
6. Refer back to Figure 2-2 and place the HSIM-W85 behind the standalone device faceplate.
7. Align the HSIM connector of the HSIM-W85 with the pins on the standalone device.

CAUTION

Ensure that the HSIM-W85 connector aligns with the device connector pins to prevent bending the pins. This can damage both the HSIM-W85 and the device.

8. Press down firmly on the HSIM-W85 until the connector slides all the way onto the HSIM pins. Ensure that the standoffs on the standalone device align with the standoff screw holes on the HSIM-W85.

9. Secure the HSIM-W85 to the module faceplate using the mounting screws saved in step 5.

10. Secure the HSIM-W85 to the module standoffs using the standoff screws included in the HSIM-W85 shipping materials.

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

11. Replace the chassis cover on the standalone device, reconnect the power cord, and reconnect the standalone device to the network.

2.3 CONNECTING THE HSIM-W85 TO THE NETWORK

The HSIM-W85 is connected to the carrier's DS1 service using twisted pair cable. The cable may run a maximum of 5000 feet or greater, depending on the dB loss of the cable. Refer to Appendix A for more details on cable length. The Cabletron Systems part number for the T1 cable is 9732094.

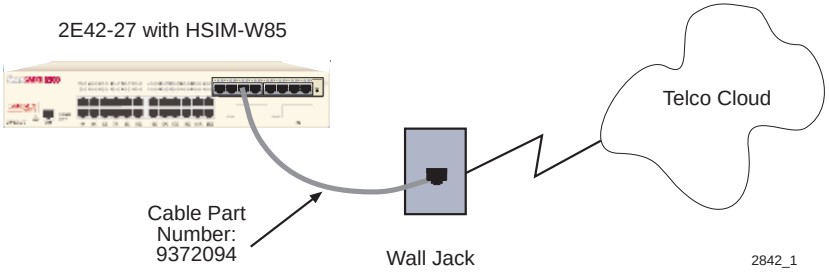


Figure B-3 HSIM-W85 Cable Connection

For information on configurations for the HSIM-W85, refer to Appendix B.

CHAPTER 3

LANVIEW LEDs

3.1 LANVIEW LEDS

This chapter describes how to use the LANVIEW LEDs to monitor the HSIM-W85 status and diagnose HSIM-W85 problems. Figure 3-1 shows the location of the HSIM-W85 LEDs.

Figure 3-1 HSIM-W85 LANVIEW LEDs

NOTE

The terms **flashing**, **blinking**, and **solid** used in Table 3-1 indicate the following:

Flashing indicates an irregular LED pulse.

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

Solid indicates a steady LED light. No pulsing.

Table 3-1 HSIM-W85 LEDs

LED	Color	Definition
Processor (CPU)	Off	Power Off
	Green (solid)	Fully operational
	Red (solid)	System in reset mode (temporary)
Link (L)	Red	No Link or Receive signal
	Amber	Traffic on at least one port
	Green	Link
Status (S)	Off	Normal (not in loopback)
	Red	Red Alarm-sync is lost this end
	Amber	Yellow Alarm-sync lost on other end
	Green (blinking)	Loopback
	Alternating Red with blinking Green for 3 seconds	Testing line

CHAPTER 4
MANAGEMENT

This chapter describes Local Management and the Network Tools utility. Local Management allows access to statistics screens that apply to the HSIM-W85 through the host platform. Network Tools allows access to a command set from which you can configure and manage the HSIM-W85. This chapter provides the following information:

- Overview of Local Management, Section 4.1
- Network Tools used with the HSIM-W85, Section 4.2
- Sample IMUX configuration, Section 4.3

4.1 LOCAL MANAGEMENT

NOTE

Access to Local Management screens and Network Tools is obtained by using Local Management on the host platform. Refer to the host platform user's guide to establish a Local Management connection, and for information on the screens.

Make sure that the following requirements have been met before accessing the HSIM-W85 through Local Management:

- The HSIM-W85 is properly installed in the host platform.
- A management terminal is properly configured and connected, either locally or using Telnet, to the host platform in which the HSIM-W85 resides. Refer to the host platform document for further information.

In order to view the HSIM-W85 statistics screens, you must navigate through a series of Local Management screens via the host platform. Figure 4-1 shows a typical hierarchy of screens that you would navigate through in order to reach the HSIM-W85 screens. The lines shown in **boldface** indicate a typical path used to access the HSIM-W85 configuration and statistics screens.

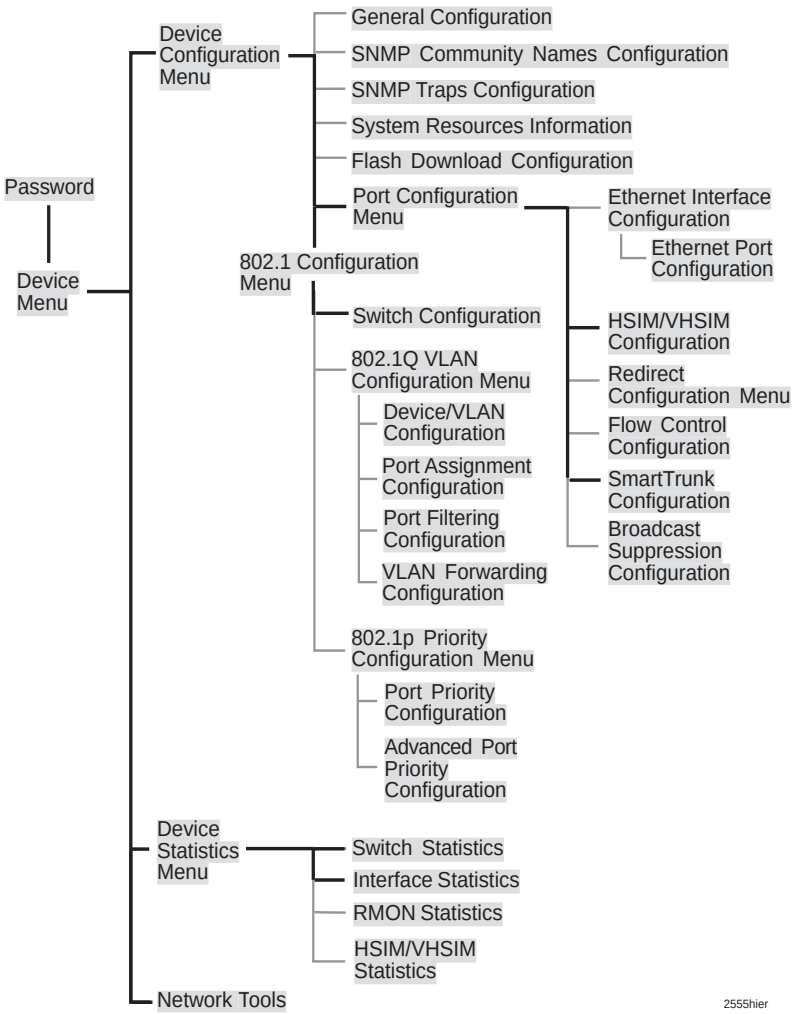


Figure 4-1 Typical Hierarchy of Local Management Screens

NOTE

Different versions of the firmware may display a different hierarchy. Check the host platform manual if the hierarchy displayed does not match the one in Figure 4-1.

The HSIM/VHSIM Statistics menu option below the Device Statistics Menu applies to the non-Ethernet HSIMs or VHSIMs such as ATM or FDDI, but not the HSIM-W85.

Important Notice

The HSIM-W85 statistics that are accessed using the Switch and Interface Statistics screens are not explained in this manual. Refer to the applicable host platform manual for details. “T1 Interface” will be displayed as the name of the eight HSIM-W85 T1 interfaces in the statistics screens. The HSIM-W85 Interface port will display as “WAN HSIM-W85 Interface” in the statistics screen.

4.2 NETWORK TOOLS

The Network Tools utility allows management of objects in the HSIM-W85 Management Information Bases (MIBs). MIBs are databases of objects used for managing the device and configuring the HSIM-W85. The commands within the MIB Navigator allow the user to view and modify a device’s objects.

The host platform software contains either the Network Tools utility, or the MIB Navigator utility. They are essentially the same tool, with some minor differences depending on the platform. They will both be referred to as Network Tools in this document, and there is no difference in their use for the purpose of this document. Using Network Tools may be a more convenient method for a user to configure the HSIM-W85 than using the MIBs in some circumstances. Full functionality is still available by using the MIBs. The host platform has a set of functions for Network Tools that are used on that platform. The following additions to the Network Tools utility from the WAN perspective are specific to the HSIM-W85, and can only be used when an HSIM-W85 is installed in the platform.

- imux – support for configuration and monitoring of the Inverse Multiplexer (ctwan-multi-imux-mib.txt, Revision 1.00.00)
- ds1alarm – support for ds1 alarm monitoring (ctremote-mib.txt, Revision 1.00.02, Ds1Alarms branch)
- wanpq – support for Wan IP Priority Queuing (ctremote-mib.txt, Revision 1.00.02, ctIPPQFilters branch)
- dsx1 – support for RFC 1406 statistics and configuration
- ds1ext – support for extensions to RFC 1406 (ctremote-mib.txt, Revision 1.00.03 CtDS1Ext branch)

Only the previous commands, which are particular to the HSIM-W85, will be described in the following sections. The host platform's manual describes the other commands that are not particular to the HSIM-W85. Refer to the host platform manual for information on the other commands.

4.2.1 Commands

The Network Tools function resides on the host platform and allows the user to access and manage network devices. Figure 4-2 shows the Network Tools Help screen. Screens may be slightly different depending on the host platform and the version of firmware.

To access the Network Tools screen, access Local Management, then use the arrow keys to navigate to and highlight the **NETWORK TOOLS** menu item in the appropriate menu screen and press ENTER. The Network Tools Help screen displays. Refer to the host platform manual for details on accessing and navigating Local Management.

TIP

Type **help** at the prompt to list all the commands that are available for the device in the current operational mode. If help is needed with a specific command, type **help** and the **<command>**. Use lower case characters when entering commands in Network Tools. Uppercase characters may be specified for some of the options. A command used incorrectly (wrong syntax or case) will prompt a display of the correct usage.

```
Welcome to Network Tools
-> help

  Commands Available to the User:

    Built in Commands:
     arp          bridge        defroute
     netstat      ping          reset
     show         traceroute

     soft_reset   telnet        link_trap
     imux         ds1alarm      wanpq
     dsx1         ds1ext        stpStandby


     SPECIAL:
         done, quit, or exit - Exit from the Network Tools.
 For help with a specific command, type 'help <command>'.
-->
```

090829

Figure 4-2 Network Tools Help Screen

The Network Tools functions are performed using a series of commands. Entering commands in Network Tools involves typing the command at the Network Tools prompt, adding any required parameters, and pressing ENTER to execute the command.

There are two categories of commands in the command set:

- Built-in Commands – Allow the user to access and manage network devices. The commands for the HSIM-W85 are **imux**, **ds1alarm**, **wanpq**, **dsx1**, and **ds1ext**. The other commands listed in Figure 4-2 are described in the host platform manual.
- Special Commands – Allow the user to exit from Network Tools. The commands are **done**, **exit**, and **quit**. All three commands perform the same function.

NOTE

The conventions used in describing the commands in Network Tools are as follows:

Arguments enclosed by [ ] require one of the strings to be entered exactly as written.

Arguments enclosed by < > require that a value be entered in place of the string.

In the following command examples, the information entered by the user is shown in **bold** 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 that may be added to the command.

Example: Shows an example of how to use the command.

4.2.2 Built-in Commands

The built-in commands listed in this section activate configuration and viewing functions on the HSIM-W85.

imux

NOTE

Cabletron Systems products that support Inverse Multiplexing (IMUX), such as the HSIM-W85, HSIM-W87, HSIM-W6, CSX400, and HSIM-W84, must exist on both ends of the WAN link for the IMUX function to work. All bridging and switching functions, such as 802.1D, SecureFast VLAN, and 802.1Q are able to run as normal on the host platform when using the IMUX function on the HSIM-W85.

Syntax:

imux <IMUXID>
imux <IMUXID> -[ea | da]
imux <IMUXID> -[eg | dg] <GROUPID>
imux <IMUXID> -[ac | dc] <GROUPID> <INTERFACENUM>

Description: imux is used to combine multiple WAN channels into logical inverse multiplexing (IMUX) groups. Once IMUX is configured, data will be evenly distributed over all of the logical channels configured.

<IMUXID> - A unique value identifying an element in a sequence of Inverse Multiplexer Applications which belong to an IP host.

<GROUPID> - A unique value identifying an element in a sequence of groups which belong to a WAN Inverse Multiplexer Application.

<INTERFACENUM> - The MIB II ifIndex value used to represent a WAN channel that has an appropriate datalink protocol associated with it.

Options: imux <IMUXID> (with no options) displays status information.
-ea enables the Inverse Multiplexer Application designated by IMUXID.
-da disables the Inverse Multiplexer Application designated by IMUXID.
-eg <GROUPID> enables the Inverse Multiplexer group designated by GROUPID.
-dg <GROUPID> disables the Inverse Multiplexer group designated by GROUPID.
-ac <GROUPID> <INTERFACENUM> adds the WAN channel designated by INTERFACENUM to the Inverse Multiplexer group designated by GROUPID.
-dc <GROUPID> <INTERFACENUM> deletes the WAN channel designated by INTERFACENUM from the Inverse Multiplexer group designated by GROUPID.

Example:

```
-> imux 1 -ac 1 29

# Inverse Multiplexer channel with ifIndex 29 added to group 1

-> imux 1

#
# WAN Inverse Multiplexer 1 Status: Disabled
#
#     Inverse                 WAN            Available    Xmit Byte        Inverse
# Multiplexer    Group   Physical            BW          Count       Multiplexer  Channel
#  ID   Admin    Status    Number          (bits/sec)    (bytes)      ID   IfIndex   Status
#-----------------------------------------------------------------------------------------------
#    1   Disabled              22              1536000       0           1       29       INACTIVE
#
#
#  Number of WAN Inverse Multiplexer Groups currently programmed : 1
#
#  Number of WAN Inverse Multiplexer Channels currently programmed : 1
```

imuxsetup1

wanpq

Syntax:

wanpq
wanpq -ea
wanpq -da
wanpq -aip <IPADDRESS>
wanpq -dip <IPADDRESS>

Description: WAN IP Priority Queuing is used to prioritize IP packets from a specified IP address. IPADDRESS is the Internet Protocol (IP) address being added to or removed from the Wide Area Network Priority Queue database.

Options: wanpq (with no options) displays information on the status of the WAN priority queue.
-ea enables the WAN Priority Queue Application.
-da disables the WAN Priority Queue Application.
-aip <IPADDRESS> adds the IP address designated by IPADDRESS to the WAN Priority Queue database.
-dip <IPADDRESS> deletes the IP address designated by IPADDRESS from the WAN Priority Queue database.

Example:

```
-> wanpq
#
#WAN Priority Queue Status: Disabled
#
#Maximum number of address entries: 16
#
#Current number of address entries programmed: 0
#
-> wanpq -ea
#
# WAN Priority Queue Application enabled.
->
```

2689_1

ds1alarm

Syntax:

ds1alarm
ds1alarm -[ea | da] <WANID>
ds1alarm -[et | dt] <WANID>
ds1alarm -sec <WANID> <VALUE>
ds1alarm -sei <WANID> <VALUE>
ds1alarm -sbr <WANID> <VALUE>
ds1alarm -sbi <WANID> <VALUE>
ds1alarm -mr <WANID>

Description:

The ds1alarm function allows the user to set error thresholds in order to set traps and monitor the operation and recovery of a device.
<WANID> This option is either ALL to apply command to all DS1 circuits, or the specific WAN physical identifier associated with the DS1 circuit.

Options:

ds1alarm (with no options) displays information on the error thresholds.
-ea enables the WAN DS1 Alarms Admin.
-da disables the WAN DS1 Alarms Admin.
-et enables the WAN DS1 Alarms Traps Feature.
-dt disables the WAN DS1 Alarms Traps Feature.
-sec sets the Errored Seconds Threshold Count to VALUE.
-sei sets the Errored Seconds Threshold Interval to VALUE.
-sbr sets the Bipolar Violations Threshold Rate to VALUE.
-sbi sets the Bipolar Violations Threshold Interval to VALUE.
-mr manually recovers a DS1 link that has exceeded a threshold

Example:

```
-> ds1alarm
#-----------------------------------------------------------------------------------------------------------
#                                    DS1        Alarm        Thresholds
#-----------------------------------------------------------------------------------------------------------
# HSIM    DS1     DS1     Admin      Trap       ES         ES          BPV Error    BPV Error
#  ID     Index   ID      Status     Admin      Count      Interval    Rate         Interval
#                                                           (minutes)               (minutes)
#-----------------------------------------------------------------------------------------------------------
#  1      1       29      Disabled   Enabled    100        6           6            15
#  1      2       30      Disabled   Enabled    100        6           6            15
#  1      3       31      Disabled   Enabled    100        6           6            15
#  1      4       32      Disabled   Enabled    100        6           6            15
#  1      5       33      Disabled   Enabled    100        6           6            15
#  1      6       34      Disabled   Enabled    100        6           6            15
#  1      7       35      Disabled   Enabled    100        6           6            15
```

2689_2

dsx1

Syntax:

dsx1
dsx1 near
dsx1 near <1..96>
dsx1 linetype <ESF|D4> <line>
dsx1 loopback <no|payload|line> <line>
dsx1 txclksrc <loop|local> <line>
dsx1 <line>
dsx1 <line>
<ES|SES|SEFS|UAS|CSS|PCV|LES|BES|DM|LCV>

Description: This command allows the user to read the contents of several tables defined in RFC 1406.
“line”, as an option, refers to the number of an instance of a physical T1 interface. A different “line” is in the choice between **no**, **payload**, and **line** for the loopback function.
The acronyms in caps refer to error types defined in the RFC. Refer to RFC 1406 for more information.
<1..96> is the number of a previous 15 minute measurement interval in the table. Interval “1” is always the latest interval to have taken place, with interval “2” as the next latest, etc.
Near indicates the device on your side of the WAN line.

Options: dsx1 (with no options) lists a summary of the DS1 configuration.
dsx1 near lists a summary of the statistics for the device on your side of the WAN line.
dsx1 near <1..96> lists a summary of the statistics for the device on your side of the WAN line for a specific time interval.
dsx1 linetype <ESF|D4> <line> allows a choice of either ESF or D4 linetype (framing).
dsx1 loopback <no|payload|line> <line> allows a choice of either no, payload, or line loopback.
dsx1 txclksrc <loop|local> <line> allows a choice of either loop or local transmit clock source.
dsx1 <line> displays the setup for the line specified.
dsx1 <line> <ES|SES|SEFS|UAS|CSS|PCV|LES|BES|DM|LCV> allows the choice of performance parameters.

Example:

-> **dsx1**

DS1 1406 Configuration:

LIne	Time	Intvl	Type	Coding	LoopCfg	Status	TxClk	FDL
29	504	1	ESF	B8ZS	NoLoop	OtherFailure	loop	Fdlnone
30	504	1	ESF	B8ZS	NoLoop	OtherFailure	loop	Fdlnone
31	504	1	ESF	B8ZS	NoLoop	OtherFailure	loop	Fdlnone
32	504	1	ESF	B8ZS	NoLoop	OtherFailure	loop	Fdlnone
33	504	1	ESF	B8ZS	NoLoop	OtherFailure	loop	Fdlnone
34	504	1	ESF	B8ZS	NoLoop	OtherFailure	loop	Fdlnone
35	504	1	ESF	B8ZS	NoLoop	OtherFailure	loop	Fdlnone
36	504	1	ESF	B8ZS	NoLoop	OtherFailure	loop	Fdlnone

----More----

2689_3

ds1ext

Syntax:

ds1ext
ds1ext crc <CRCVAL> <LINE>
ds1ext linecode <LCVAL> <LINE>
ds1ext lbo <LBOVAL> <LINE>

Description:

This command allows the user to modify various ds1 parameters that are extensions to RFC 1406. The following is an explanation of the various command options:
<LINE> - The MIB II ifIndex value used to represent a DS1 interface.
<CRCVAL> - Amount of frame check sequence bits appended to data. Valid values are 16 and 32.
<LCVAL> - Valid line code values are none, jBZS, and invHDLC.
<LBOVAL> - Valid line build out values are 0, -7.5, -15, 133, 266, 399, and 533.

Options:

ds1ext (with no options) displays currently programmed parameters.
ds1ext crc <CRCVAL> <LINE> changes the amount of frame check sequence bits appended to data transmitted from the DS1 designated by <LINE> to <CRCVAL>.
ds1ext linecode <LCVAL> <LINE> changes the line coding value programmed on the DS1 designated by <LINE> to <LCVAL>. This value should not be modified unless no other form of zero code suppression is used, and the main line encoding does not provide zero code suppression (as in AMI line coding).
ds1ext lbo <LBOVAL> changes the line build out value programmed on the DS1 designated by <LINE> to <LBOVAL>. The values 0, -7.5 and -15 are decibel levels for long haul configurations, while the other values are ranges, measured in feet for short haul configurations.

Example:

```
-> ds1ext

 DS1 Extensions Configuration:

                    Channel        Line
Line   CRC   Line Code        Build Out
 29     16      none            0 db
 30     16      none            0 db
 31     16      none            0 db
 32     16      none            0 db
 33     16      none            0 db
 34     16      none            0 db
 35     32      jBZS            0 db
 36     16      none            0 db
->
```

2689_8

4.2.3 Special Commands

done, quit, exit

Syntax: done
quit
exit

Description: The done, exit, or quit command enables the user to exit from Network Tools and return to the Main Menu screen. All three commands perform the same function.

Options: Not Applicable

Example: Screen returns to previous menu.

TIP

To find the MIB II interface indexes assigned to the ds1 channels used in the IMUX group, utilize the dsx1 and ds1alarm commands. With the dsx1 command, the interface numbers are in the column under “line” in the display. When the ds1alarm command is used, the interface numbers, as well as the HSIM ID and the ds1 index, can be seen for verification.

Also, in the Interface Statistics screen, as the Interfaces are incremented, the Name of the interface can be seen, and then used to correlate with the number to identify it.

4.3 SAMPLE IMUX CONFIGURATION

The following is a sample of a common configuration.

To perform an IMUX configuration for the setup shown in Figure B-1, in Appendix B, follow these steps:

1. To add channels to an IMUX group:
   Enter: imux 1 -ac 1 29
   (This adds interface 29 to the group id 1 in the imux id 1.)
   To display the setup so far:
   Enter: imux 1
   Figure 4-3 shows the imux setup for group id 1 so far:

```
-> imux 1 -ac 1 29

# Inverse Multiplexer channel with ifIndex 29 added to group 1

-> imux 1

#
# WAN Inverse Multiplexer 1 Status: Disabled
#
#     Inverse                WAN            Available    Xmit Byte        Inverse
# Multiplexer    Group   Physical            BW         Count      Multiplexer  Channel
#  ID   Admin   Status    Number          (bits/sec)    (bytes)     ID   IfIndex   Status
#-----------------------------------------------------------------------------------------------
#   1   Disabled              22              1536000       0          1      29       INACTIVE
#
#
#  Number of WAN Inverse Multiplexer Groups currently programmed : 1
#
#  Number of WAN Inverse Multiplexer Channels currently programmed : 1
```

imuxsetup1

Figure 4-3 Adding Channels to an IMUX Group

2. After all the desired channels have been added to the group (four were put in the group in this example), the group must be enabled:
   Enter: imux 1 -eg 1
   The screen shows the response to the imux command to enable group 1 in Figure 4-4.

```
-> imux 1

#
# WAN Inverse Multiplexer 1 Status: Disabled
#
#     Inverse                WAN          Available   Xmit Byte       Inverse
# Multiplexer   Group   Physical            BW        Count     Multiplexer  Channel
#  ID   Admin   Status   Number          (bits/sec)   (bytes)     ID   IfIndex   Status
#-----------------------------------------------------------------------------------------
#   1   Disabled          21              1536000       0          1      28      INACTIVE
#   1   Disabled          22              1536000       0          2      29      INACTIVE
#   1   Disabled          23              1536000       0          3      30      INACTIVE
#   1   Disabled          24              1536000       0          4      31      INACTIVE
#
#
#  Number of WAN Inverse Multiplexer Groups currently programmed : 1
#
#  Number of WAN Inverse Multiplexer Channels currently programmed : 4

-> imux 1 -eg 1

# Inverse Multiplexer group 1 enabled.
```

imuxsetup2

Figure 4-4 Enabling the IMUX Group

3. The next step is to enable the imux application for imux 1:
Enter: imux 1 -ea
The screen in Figure 4-5 displays the response to the command.

```
->imux 1 -ea

# Inverse Multiplexer Application 1 enabled.

-> imux 1

# WAN Inverse Multiplexer 1 Status: Enabled
#
#     Inverse                WAN          Available   Xmit Byte       Inverse
# Multiplexer   Group   Physical            BW        Count     Multiplexer  Channel
#  ID   Admin   Status   Number          (bits/sec)   (bytes)     ID   IfIndex   Status
#-----------------------------------------------------------------------------------------
#   1   Enabled           21              1536000       0          1      28      INACTIVE
#   1   Enabled           22              1536000       0          2      29      INACTIVE
#   1   Enabled           23              1536000       0          3      30      INACTIVE
#   1   Enabled           24              1536000       0          4      31      INACTIVE
#
#
# Number of WAN Inverse Multiplexer Groups currently programmed : 1
#
# Number of WAN Inverse Multiplexer Channels currently programmed : 4

->
```

imuxsetup3

Figure 4-5 Enabling the IMUX Application

This configuration is complete. More groups can be added as needed. The commands dsx1 and/or ds1alarm can be used to verify the interface numbers configured. Done, exit, or quit may be used after verification to leave Network Tools.

CHAPTER 5

TROUBLESHOOTING

5.1 TROUBLESHOOTING THE HSIM-W85

The following sections detail some of the problems encountered in hardware, software, and firmware setups and the possible solutions. If a problem persists, contact Cabletron Systems. Refer to Section 1.8.

5.1.1 Hardware Troubleshooting

No LEDs on

- Check the host platform to see if it is powered up.
- Check that the HSIM-W85 has been connected correctly, that the connectors have no bent pins.

Link (L) LED is OFF

The WAN interface is not configured for operation. Power is off or the HSIM-W85 is not connected properly.

Link (L) LED is RED

The WAN interface is configured, but there is no signal indicating that a valid connection is present on the WAN interface.

- Check that the device at the other end of the segment is powered up.
- Use management to make sure that both WAN interfaces, local and remote, are configured correctly.
- Check to ensure that the correct cable is being used. Refer to Appendix A for details.
- Check to ensure that the cable has continuity and is installed correctly.
- For back-to-back testing, Cabletron Systems cable part number 9360106 can be used. Another known good HSIM-W85 can be connected using this cable to test the unit.

- Check with the WAN Service Provider to ensure that the circuit has been configured by them and is active.

NOTE

It may be necessary to provide proof of proper configuration of your WAN connection. Service Providers typically require proof that the customer's equipment is configured correctly before checking their own configuration.

Status (S) LED is OFF

The port is operating normally. If it is not, and this LED is OFF, the port may be disabled. Use management to make sure that the WAN interface on the HSIM-W85 is configured correctly.

Status (S) LED is RED

A RED alarm indicates that the WAN connection is not receiving proper framing or has lost framing from the remote device.

- Verify the framing, zero suppression.
- Verify the use of proper cabling on the WAN connection.

Status (S) LED is AMBER

The device is in Yellow alarm mode. A Yellow alarm indicates that the HSIM-W85 is receiving proper framing from the Telco, but the Telco is not receiving proper framing.

- Check for faulty or incorrect cabling between the Telco and the HSIM-W85.
- Request that the Telco verify the configuration and operation of the circuit.

Status (S) LED is GREEN (blinking)

Device is in test mode.

- The HSIM-W85 is running its Power-up Diagnostic Tests.
- Loopback Testing is underway on a WAN circuit. Loopback testing can be initiated by the Telco.

5.1.2 Investigating Software Configuration Problems

Software problems usually occur when your software configuration contains incomplete or incorrect information.

Device not forwarding packets

- Ensure that the proper DS1 transmit clock source is configured using the dsx1 command in Network Tools.

NOTE

When connecting two ds1 devices, one must be tx clock master (local timing) and the other must be slave (loop timing).

- Check the DS1 line type. The default is ESF but some devices may be configured for D4. Ensure that the local and remote DS1 devices are configured with the same line (Framing) type.
- Ensure that the DS1 loopback is not configured (default is none) using the dsx1 command.

5.1.3 Problems with the Firmware Image

The firmware image for the HSIM-W85 is supported on the host platform. If there is a problem with the firmware image for the HSIM-W85, the image for the platform must be downloaded. Refer to the host platform user's guide for information on this procedure.

APPENDIX A
SPECIFICATIONS

This chapter lists the specifications and regulatory requirements for the HSIM-W85. Cabletron Systems reserves the right to change these specifications at any time without notice.

A.1 PHYSICAL PROPERTIES

WAN Interface	8 DS1 ports
Physical Interface	RJ45 connectors
Cable Type	Twisted pair
Maximum Link Distance	The maximum link distance can be greater than 5000 ft (1524 m). The length of the jumper cable from the HSIM-W85 to the wall jack is included in the total distance. The total length of the cable from the HSIM-W85 to the first T1 repeater must not exceed dB loss of -36 including the jumper cable and all connectors.
T1 Cable Part Number	9372094 -10 ft (feet) 9372094 -xx (meters)
Microprocessor	i960HD66
Power Supply	+5V supplied by host device
Power Consumption	17.5 Watts maximum
Memory	8 MB of DRAM Local memory 4 MB of DRAM Shared memory
Dimensions	4.8H x 20.6W x 28.7D (cm) 1.9H x 8.1W x 11.3D (in)
Weight	0.45 kg (1.0 lb)
MTBF (Predicted)	200,000 hours

A.2 ENVIRONMENTAL REQUIREMENTS

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

A.3 REGULATORY COMPLIANCE

This equipment meets the following safety and electromagnetic compatibility (EMC) requirements:

Safety	UL 1950 and CSA C22.2 No. 950
Electromagnetic Compatibility (EMC)	FCC Part 15, EN 55022, CSA C108.8, EN 50082-1, VCCI V-3, 89/336/EEC, and AS/NZS 3548
Telecommunications	FCC CFR47 Part 68, CS-03

APPENDIX B

TYPICAL CONFIGURATION

The HSIM-W85 can be used to aggregate up to eight T1 connections to the backbone, which may be linked to a head-end consisting of an HSIM-W87 in a platform. The HSIM-W85 is compatible with any Cabletron Systems product that runs HDLC WAN protocol.

NOTE

In Figure B-1, the 2E42-27 is used as an example host platform. It could be any platform with which the HSIM-W85 is compatible.

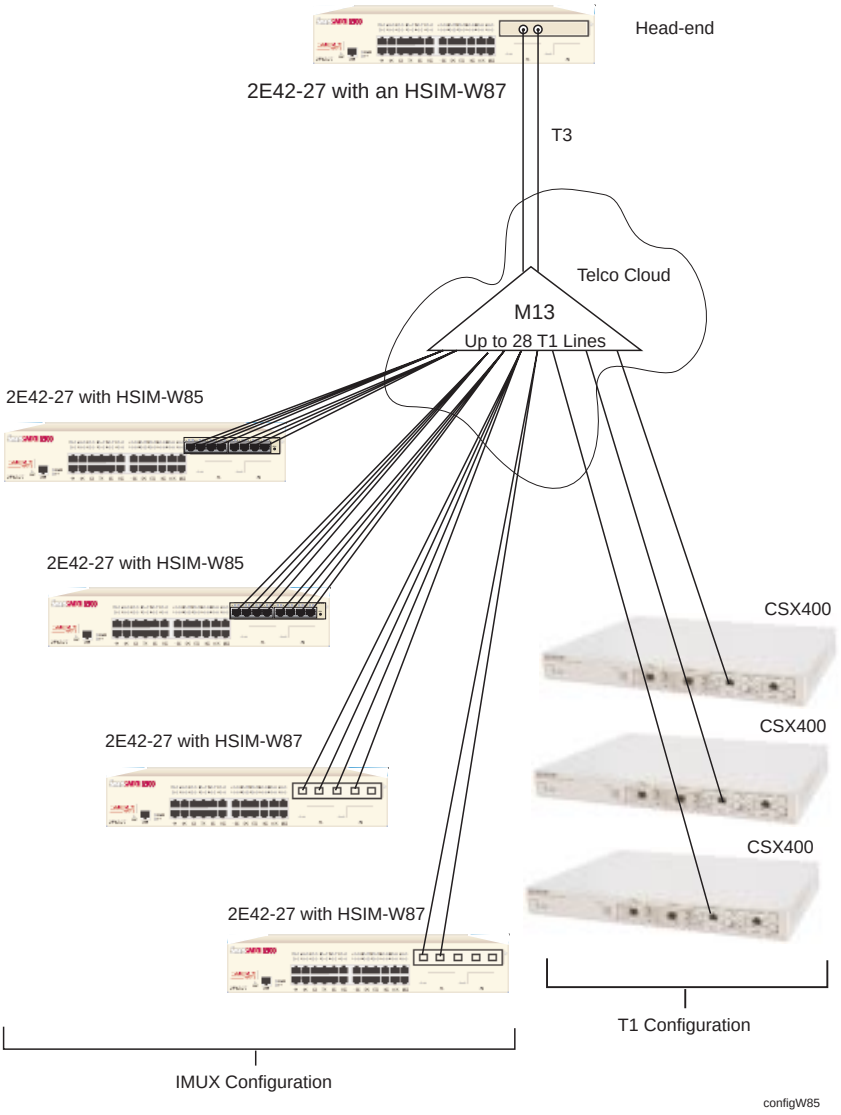


Figure B-1 HSIM-W85 IMUX Operational

APPENDIX C

FCC PART 68 - USER'S INFORMATION

The following instructions are provided 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 telephone company of the following information:

Port ID	REN/SOC	FIC	USOC
HSIM-W85	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 you 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.

   Service can be obtained at Cabletron Systems Technical Support:

Address:	Cabletron Systems, Inc. 35 Industrial Way, Rochester, NH 03867-0505
Phone:	(603) 332-9400
Internet mail:	support@cabletron.com

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 _____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.

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: